

Washtenaw Community College Comprehensive Report

CPS 272 Data Structures with C++ Effective Term: Spring/Summer 2025

Course Cover

College: Business and Computer Technologies

Division: Business and Computer Technologies

Department: Computer Science & Information Technology

Discipline: Computer Science

Course Number: 272

Org Number: 13420

Full Course Title: Data Structures with C++

Transcript Title: Data Structures C++

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Time Schedule , Web Page

Reason for Submission: Course Change

Change Information:

Consultation with all departments affected by this course is required.

Outcomes/Assessment

Objectives/Evaluation

Rationale: Updating for Canvas

Proposed Start Semester: Winter 2025

Course Description: In this course, students continue the C++ sequence and study more advanced computer science features as implemented in C++. Topics include advanced data structures, complexity/efficiency of algorithms, recursion and problem-solving. These techniques will be applied toward building a working software application.

Course Credit Hours

Variable hours: No

Credits: 4

Lecture Hours: Instructor: 60 **Student:** 60

Lab: Instructor: 0 **Student:** 0

Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 60 **Student:** 60

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

No Level Required

Requisites

Prerequisite

CPS 271 minimum grade "C"

General Education

General Education Area 7 - Computer and Information Literacy

Assoc in Arts - Comp Lit

Assoc in Applied Sci - Comp Lit

Assoc in Science - Comp Lit

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Identify appropriate use of recursive programming techniques.

Assessment 1

Assessment Tool: Outcome-related departmental exam questions

Assessment Date: Fall 2024

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of the student will score 70% or higher.

Who will score and analyze the data: Departmental faculty

2. Identify appropriate use of programming data structures: vectors, linked lists, stacks, queues, hash, graphs and binary search trees.

Assessment 1

Assessment Tool: Outcome-related departmental exam questions

Assessment Date: Fall 2024

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of the student will score 70% or higher.

Who will score and analyze the data: Departmental faculty

3. Apply advanced software engineering techniques in developing a working software program.

Assessment 1

Assessment Tool: Outcome-related portfolio of software programs

Assessment Date: Fall 2024

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 70% of the student will score 70% or higher.

Who will score and analyze the data: Departmental faculty

Course Objectives

1. Demonstrate proficiency in analyzing and using object-oriented classes.
2. Demonstrate proficiency using recursion to solve computer problems.
3. Demonstrate proficiency in using a vector data structure.
4. Demonstrate proficiency in using a linked list data structure.
5. Demonstrate proficiency in using a stack data structure.
6. Demonstrate proficiency in using a queue data structure.
7. Demonstrate proficiency in using a binary tree (or set) data structure.

8. Create a program that is logical, easy to understand, compiles and executes properly to solve a stated problem.
9. Demonstrate proficiency in using a hashing data structure.

New Resources for Course

Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

Computer workstations/lab

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Khaled Mansour</i>	<i>Faculty Preparer</i>	<i>Jan 18, 2024</i>
Department Chair/Area Director: <i>Scott Shaper</i>	<i>Recommend Approval</i>	<i>Jan 22, 2024</i>
Dean: <i>Eva Samulski</i>	<i>Recommend Approval</i>	<i>Jan 23, 2024</i>
Curriculum Committee Chair: <i>Randy Van Wagnen</i>	<i>Recommend Approval</i>	<i>Jan 28, 2025</i>
Assessment Committee Chair: <i>Jessica Hale</i>	<i>Recommend Approval</i>	<i>Feb 18, 2025</i>
Vice President for Instruction: <i>Brandon Tucker</i>	<i>Approve</i>	<i>Feb 18, 2025</i>

Washtenaw Community College Comprehensive Report

CPS 272 Data Structures with C++ Effective Term: Fall 2019

Course Cover

Division: Business and Computer Technologies

Department: Computer Instruction

Discipline: Computer Science

Course Number: 272

Org Number: 13420

Full Course Title: Data Structures with C++

Transcript Title: Data Structures C++

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Time Schedule , Web Page

Reason for Submission:

Change Information:

Consultation with all departments affected by this course is required.

Rationale: This will be revised because of the course assessment.

Proposed Start Semester: Fall 2019

Course Description: In this course, students continue the C++ sequence and study more advanced computer science features as implemented in C++. Topics include advanced data structures, complexity/efficiency of algorithms, recursion and problem-solving.

Course Credit Hours

Variable hours: No

Credits: 4

Lecture Hours: Instructor: 60 Student: 60

Lab: Instructor: 0 Student: 0

Clinical: Instructor: 0 Student: 0

Total Contact Hours: Instructor: 60 Student: 60

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

No Level Required

Requisites

Prerequisite

CPS 271 minimum grade "C"

General Education

General Education Area 7 - Computer and Information Literacy

Assoc in Arts - Comp Lit

Assoc in Applied Sci - Comp Lit
Assoc in Science - Comp Lit

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Identify appropriate use of object-oriented design methods.

Assessment 1

Assessment Tool: Departmental exam

Assessment Date: Fall 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of the student will score 70% or higher

Who will score and analyze the data: Departmental faculty

2. Identify appropriate use of recursive programming techniques.

Assessment 1

Assessment Tool: Departmental exam

Assessment Date: Fall 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of the student will score 70% or higher

Who will score and analyze the data: Departmental faculty

3. Identify appropriate use of programming data structures: vectors, linked lists, stacks, queues and binary trees.

Assessment 1

Assessment Tool: Departmental exam

Assessment Date: Fall 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of the student will score 70% or higher

Who will score and analyze the data: Departmental faculty

4. Demonstrate sound software engineering techniques in developing a working software program.

Assessment 1

Assessment Tool: A portfolio of software programs submitted by students will be blind graded.

Assessment Date: Fall 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmentally developed rubric

Standard of success to be used for this assessment: 70% of the student will score 70% or higher

Who will score and analyze the data: Departmental faculty

Course Objectives

1. Demonstrate proficiency in analyzing object-oriented classes.

2. Demonstrate proficiency in using object-oriented classes.
3. Demonstrate proficiency using recursion to solve computer problems.
4. Demonstrate analyzing the efficiency of recursive solutions.
5. Demonstrate proficiency in using a vector data structure.
6. Demonstrate proficiency in using a linked list data structure.
7. Demonstrate proficiency in using a stack data structure.
8. Demonstrate proficiency in using a queue data structure.
9. Demonstrate proficiency in using a binary tree (or set) data structure.
10. Create a program that is logical, easy to understand and properly indented to solve a stated problem.
11. Create a program that solves a stated problem and compiles properly.
12. Create a program that executes properly to solve a stated problem.

New Resources for Course

Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Khaled Mansour</i>	<i>Faculty Preparer</i>	<i>Jan 10, 2019</i>
Department Chair/Area Director: <i>Philip Geyer</i>	<i>Recommend Approval</i>	<i>Mar 11, 2019</i>
Dean: <i>Eva Samulski</i>	<i>Recommend Approval</i>	<i>Mar 15, 2019</i>
Curriculum Committee Chair: <i>Lisa Veasey</i>	<i>Recommend Approval</i>	<i>Apr 02, 2019</i>
Assessment Committee Chair: <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Apr 03, 2019</i>
Vice President for Instruction: <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Apr 07, 2019</i>