



**CAMOSUN COLLEGE**  
**Trades and Technology**  
**Computer Science**

**ICS 124 – Algorithms and Data Structure Programming**  
**Winter 2021**

**COURSE OUTLINE**

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Calendar Description: [ICS Courses](#)

Ω Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

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**1. Instructor Information**

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|-------------------------|---|
| <b>(a) Instructor</b>   | Lynda E. Robbins, PhD   |
| <b>(b) Office hours</b> | By appointment via email  |
| <b>(c) Location</b>     | Online – d2l Collaborate  |
| <b>(e) E-mail</b>       | <a href="mailto:robbinsl@camosun.bc.ca">robbinsl@camosun.bc.ca</a><br><i>Please note: Lynda responds to her email within 24 hours. If you send an email and do not receive a response within 24 hours, please resend the email.</i> |
| <b>(f) Website</b>      | Camosun d2l: <a href="https://online.camosun.ca/d2l/home">https://online.camosun.ca/d2l/home</a>  |

**2. Intended Learning Outcomes**

Upon successful completion of this course, a student will be able to:

- Design, implement, test and debug object-oriented solutions for small systems involving multiple objects;
    - including programming techniques of inheritance, abstraction, modularization, information hiding, overloading, interfaces
  - Identify appropriate abstract data types and data structures based on the characteristics of the application;
    - including use of software libraries
  - Implement and evaluate the trade-offs between a static and a dynamic implementation of an abstract data type using Big-O notation;
  - Apply problem-solving skills and provide a foundation for advanced programming courses;
    - developing, understanding, and debugging software components
- Apply accepted standards to ensure security, privacy, and integrity of data while recognizing the ethical, legal, and social implications of computing.

### 3. Access to Required Online Textbook (US\$):

Please provide the following instructions to your students. Copy into your syllabus, discussion board, etc.

1. Sign in or create an account at [learn.zybooks.com](https://learn.zybooks.com)
2. Enter zyBook code

**CAMOSUNICS124RobbinsSpring2021**

3. Subscribe

A subscription is \$58. Students may begin subscribing on Dec 28, 2020 and the cutoff to subscribe is Apr 19, 2021. Subscriptions will last until May 17, 2021.

### 4. Course Content and Schedule

The following is a *tentative* schedule of the order in which topics will be covered. *Please note this is subject to change as the term progresses.*

Week Number	Week of	Topic
1	January 11	<ul style="list-style-type: none"><li>- Course Introduction</li><li>- Programming Review</li></ul>
2	January 18	<ul style="list-style-type: none"><li>- OOP</li><li>- Complexity Theory</li></ul>
3	January 25	<ul style="list-style-type: none"><li>- Searching</li><li>- Sorting</li></ul>
4	February 1	<ul style="list-style-type: none"><li>- Java ArrayList Class</li><li>- Java: Abstract Classes</li><li>- Introduction to ADTs (Abstract Data Types)</li></ul>
5	February 8	<ul style="list-style-type: none"><li>- Java:<ul style="list-style-type: none"><li>o Generics</li><li>o Interfaces</li></ul></li></ul>
<b>READING BREAK</b>	February 15	<b>Family Day Monday, Reading Break Tuesday-Friday No classes/labs.</b>
6	February 22	<ul style="list-style-type: none"><li>- List ADT: Introduction</li></ul>
7	March 1	<ul style="list-style-type: none"><li>- Lists (<i>continued</i>):<ul style="list-style-type: none"><li>o ADT</li><li>o Implementations:<ul style="list-style-type: none"><li>▪ Array</li></ul></li></ul></li><li>- Linked List</li></ul>

8	March 8	<ul style="list-style-type: none"> <li>- Stacks: <ul style="list-style-type: none"> <li>○ ADT</li> <li>○ Implementations: <ul style="list-style-type: none"> <li>▪ Array</li> <li>▪ Linked List</li> </ul> </li> <li>○ Applications</li> </ul> </li> </ul>
9	March 15	<ul style="list-style-type: none"> <li>- Recursion</li> <li>- Recursive Sorts</li> </ul>
10	March 22	<ul style="list-style-type: none"> <li>- Queues: <ul style="list-style-type: none"> <li>○ ADT</li> <li>○ Implementations: <ul style="list-style-type: none"> <li>▪ Array</li> <li>▪ Linked List</li> </ul> </li> <li>○ Applications</li> </ul> </li> </ul>
11	March 29 <b>Note:</b> <b>April 2 Good Friday</b> <b>(College Closed –</b> <b>No classes/labs)</b>	<ul style="list-style-type: none"> <li>- Trees: <ul style="list-style-type: none"> <li>○ ADT</li> <li>○ Implementations: <ul style="list-style-type: none"> <li>▪ Array</li> <li>▪ Linked List</li> </ul> </li> <li>○ Applications</li> </ul> </li> </ul>
12	April 5 <b>Note:</b> <b>April 5 Easter Monday</b> <b>(College Closed –</b> <b>No classes/labs)</b>	<ul style="list-style-type: none"> <li>- Maps</li> <li>- Sets</li> <li>- Hash Tables</li> </ul>
13	April 12	<ul style="list-style-type: none"> <li>- Heaps</li> </ul>
EXAM PERIOD	April 19 – April 27	

## 5. Basis of Student Assessment (Weighting)

ITEM	Weight (%)	Details
zyBook <i>Participation, Challenge, and zyLabs Activities (not included as part of an assignment.)*</i>	5	Students are expected to work on these zyBook activities during lab times and on their own time.
Terminology Record	5	Each student will create their own reference document containing the terminology used in this course. This will help you with your studying and serve as a reference for the future.
zyBook Assignments***	20	Students are expected to work on these assignments during lab times and on their own time.
Tests**	3 tests * 10%	Three tests throughout the term will be held during the synchronous class time Mondays 9:30am – 11:00 am on the following dates: <ol style="list-style-type: none"> <li>1. <i>Monday February 8</i></li> <li>2. <i>Monday March 8</i></li> <li>3. <i>Monday March 29</i></li> </ol>
Final Exam**	40	The final exam is scheduled by Camosun College. Be sure to check the date before making travel arrangements.

## NOTES:

1. In order to receive a mark of **at least 50%** in the course, the following criteria must be satisfied:
  - a. \*A minimum mark of 85% must be achieved on the *zyBook Participation, Challenge, and zyLabs Activities (not included as part of an Assignment.)*
  - b. \*\*All *Tests* and the *Final Exam* must be written.
  - c. \*\*A weighted average of at least 55% must be achieved on *Tests* and the *Final Exam*.
  - d. \*\*\*All assignments must be submitted with a weighted average of at least 55% achieved.
  
2. In order to receive a mark of **at least 60%** in the course, the following criteria must be satisfied:
  - a. \*A minimum mark of 85% must be achieved on the *zyBook Participation, Challenge, and zyLabs Activities (not included as part of an assignment.)*
  - b. \*\*All *Tests* and the *Final Exam* must be written.
  - c. \*\*A weighted average of at least 60% must be achieved on the *Tests* and *Final Exam*.
  - d. \*\*\*All assignments must be submitted with a weighted average of at least 60% achieved.
  
3. Late work is **not** accepted except in exceptional circumstances with the instructor's prior written permission or in the presence of a dire and documented short-term medical or family emergency.
  
4. See additional Department Policies under section 8.
  
5. For in person testing, students are not permitted to leave the room during a test/quiz/exam except with prior accommodation.

## 6. Grading System

- Standard Grading System (GPA)
- Competency Based Grading System

## 7. Recommended Materials to Assist Students to Succeed Throughout the Course

### Student Conduct:

It is important you familiarize yourself with college policy around academic honesty and what it means when you violate the Standards of Integrity.

Policy E-1.13: Academic Integrity <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf>

Policy E-2.5.1: Plagiarism: Definitions and Consequences  
<http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.1.pdf>

See below for Department Policy on Academic Integrity violations.

### **Academic Accommodations (CAL – Centre for Accessible Learning):**

Students are responsible to communicate with your instructors. If you are registered with CAL, CAL will provide you with a letter for each course instructor outlining what accommodations you require.

Connecting with your course instructors shortly after you have shared your letter of academic accommodation (as early as possible at the beginning of the term, if possible) will provide an opportunity to discuss the content, structure and expectations of the course as they relate to your academic accommodations. Connecting with your instructor(s) gives you both a good opportunity to consider how the term might work and any contingency plans that may be needed. You are not required to disclose the nature of your disability to your course instructor(s), just what academic accommodations you need.

If you have accommodations for exams, it is your responsibility to review and follow the processes outlined on the Exams page: <http://camosun.ca/services/accessible-learning/current-students.html>

The following document is also helpful in understanding academic accommodations:  
<http://camosun.ca/services/accessible-learning/documents/academic-accommodation.pdf>

## **8. College Supports, Services and Policies**



### **Immediate, Urgent, or Emergency Support**

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ <http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

## Department Policies:

**Grade review:** You have 7 days after marks are posted to review with your instructor.

### Academic Integrity Violations:

1<sup>st</sup> violation: minus the weight of the deliverable and a note on your departmental file.

2<sup>nd</sup> violation: F in the course

3<sup>rd</sup> violation: Student Conduct [Policy](#) E-2.5 is applied

**Missed Examinations/Quizzes:** If a student misses a quiz, project or an exam, a mark of zero will be assigned unless there are extenuating circumstances. *You must provide a note from a medical practitioner (Doctor, Nurse, Psychologist, Counsellor, etc.)* In such cases, the proportion of grade assigned to the missed quiz or exam will be added to the proportion assigned to the final exam. The final exam will be held during exam week. NO consideration will be given to any student wishing to write the exam at any other time than that assigned.

**Electronic Devices:** The school's policy regarding electronic devices is that any student who has a cell phone or other unauthorized electronic device (ie. ipad, laptop, playbook, etc.) on their person or around their desk during a closed book exam will be guilty of cheating and will receive a grade of "F" for the course.

## College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

## College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

A. **GRADING SYSTEMS** <http://www.camosun.bc.ca/policies/policies.php>

The following two grading systems are used at Camosun College:

1. Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0

2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course, practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.



## B. Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at <http://www.camosun.bc.ca/policies/E-1.5.pdf> for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.