

# COURSE SYLLABUS



COURSE TITLE: ICS 114 – Algorithms and Programming  
CLASS SECTION: X03AB  
TERM: 2021F  
COURSE CREDITS: 3  
DELIVERY METHOD(S): Lecture, Lab

Camosun College campuses are located on the traditional territories of the Lək̓ʷəŋən and W̱SÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here.  
Learn more about Camosun's [Territorial Acknowledgement](#).

For COVID-19 information please visit <https://legacy.camosun.ca/covid19/index.html>.

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*Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable explanation in advance, you will be removed from the course and the space offered to the next waitlisted student.*

## INSTRUCTOR DETAILS

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NAME: Stephen Lang  
EMAIL: [langs@camosun.bc.ca](mailto:langs@camosun.bc.ca)  
OFFICE: Tech 252  
HOURS: Wednesday from 11am – 12 pm, Friday 10:30am – 12:30pm

*As your course instructor, I endeavour to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me. Camosun College is committed to identifying and removing institutional and social barriers that prevent access and impede success.*

## CALENDAR DESCRIPTION

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Learn how to design and implement algorithms to solve problems using object-oriented programming. You will start to practice the foundational skills, tools and methods to produce and maintain quality software systems.

Pre-requisites:

**One of:**

- C in [English 12](#)
- C in [English 12 Camosun Alternative](#)

**And one of:**

- C+ in [Pre-calculus 11](#)
- C in [Math 12](#)
- C in Apprenticeship Math 12
- C+ in [MATH 073](#)
- C+ in [MATH 077](#)
- C+ in MATH 137
- C in [MATH 097](#)
- C in [MATH 139](#)

## COURSE LEARNING OUTCOMES / OBJECTIVES

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

- Design and code a medium-complexity (non-database, non-web form) C# program;
- Understand the language syntax rules for the C# programming language;
- Write statements that call methods and to write their own class methods;
- Test, troubleshoot, and debug issues associated with C# programming;
- Describe how to declare and perform compile-time initialization of array elements;
- Define and code object-oriented classes, methods, and objects;
- Create, open, close, read, and write files;
- Understand the language syntax rules for the C# programming language;
- Think critically to evaluate information, solving problems, and making decisions as they relate to the use of software tools for software development; and
- Apply accepted standards to ensure security, privacy, and integrity of software while recognizing the ethical, legal, and social implications of software development.

## REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

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None required. Recommended textbook: C# Programming, 5<sup>th</sup> ed, Barbara Doyle, Cengage Learning Publisher

## COURSE SCHEDULE, TOPICS, AND ASSOCIATED PREPARATION / ACTIVITY / EVALUATION

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The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor.

WEEK	ACTIVITY	OTHER NOTES
1	<ol style="list-style-type: none"><li>1. (Very) Short history of computers</li><li>2. What's the difference between system software and application software?</li><li>3. Investigate the steps of software development (in general)</li><li>4. Review different programming methodologies</li><li>5. What makes C# an appropriate development language?</li><li>6. What kinds of software applications can be created with C#?</li></ol>	

WEEK	ACTIVITY	OTHER NOTES
	<ol style="list-style-type: none"> <li>7. Explore an application written in C#</li> <li>8. What are the basic elements contained in a C# program?</li> <li>9. Compile, run, build, and debug an application</li> <li>10. Create a sample application that displays output</li> </ol> <p>Work through a programming example that illustrates the chapter's concepts.</p>	
2	<ol style="list-style-type: none"> <li>1. Examine how computers represent data</li> <li>2. Declare memory locations for data</li> <li>3. Explore the relationship between classes, objects, and types</li> <li>4. Use predefined data types</li> <li>5. Use integral data types</li> <li>6. Use floating-point types</li> <li>7. Learn about the decimal data type</li> <li>8. Declare Boolean variables</li> <li>9. Declare and manipulate strings</li> <li>10. Work with constants</li> <li>11. Write assignment statements using arithmetic operators</li> <li>12. Learn about the order of operations</li> <li>13. Learn how expressions with mixed data types are handled</li> <li>14. Perform an explicit data type conversion with cast</li> <li>15. Learn special formatting rules for currency</li> <li>16. Work through a programming example that illustrates the chapter's concepts</li> </ol>	
3	<ol style="list-style-type: none"> <li>1. Examine the components of a method</li> <li>2. Call class methods with and without parameters</li> <li>3. Use predefined methods in the Console and Math classes</li> <li>4. Write our own value and nonvalue-returning class methods (with and without parameters)</li> <li>5. Distinguish between value, ref, and out parameter types</li> <li>6. Explore the use of named and optional parameter types</li> <li>7. Work through a programming example that illustrates the chapter's concepts</li> <li>8. Coding standards</li> </ol>	
4	<ol style="list-style-type: none"> <li>1. Become familiar with the components of a class</li> <li>2. Write instance methods and properties used for object-oriented development</li> <li>3. Create and use constructors to instantiate objects</li> <li>4. Call instance methods including mutators, and accessors</li> <li>5. Become familiar with auto property initializers</li> <li>6. Work through a programming example that illustrates the chapter's concepts</li> <li>7. Naming Conventions</li> </ol>	
5	<ol style="list-style-type: none"> <li>1. Learn about conditional expressions that return Boolean results and those that use the bool data type</li> <li>2. Examine equality, relational, and logical operators used with conditional expressions</li> <li>3. Write an if selection type statement to include one-way, two-way, and nested forms</li> <li>4. Learn about and write switch statements</li> <li>5. Learn how to use the ternary operator to write selection statements</li> </ol>	

WEEK	ACTIVITY	OTHER NOTES
	<ol style="list-style-type: none"> <li>6. Revisit the operator precedence and explore the order of operations</li> <li>7. Work through a programming example that illustrates the chapter concepts</li> <li>8. Coding Standards</li> </ol>	
6	<ol style="list-style-type: none"> <li>1. Why programs use loops.</li> <li>2. How the <b>while</b> loop implements a counter-, a state-, and a sentinel-controlled loop</li> <li>3. Examine the conditional expressions that make up a <b>for</b> loop</li> <li>4. Be introduced to the <b>foreach</b> looping structure</li> <li>5. Compare the <b>do...while</b> loop structure with the predefined forms of loops</li> <li>6. Write loops nested inside other loops</li> <li>7. Learn about keywords that can be used for unconditional transfer of control</li> <li>8. Be introduced to recursion and learn how recursive methods work</li> <li>9. Pick an appropriate loop structure for different applications</li> <li>10. Work through a programming example that illustrates the chapter's concepts</li> </ol>	
7	<ol style="list-style-type: none"> <li>1. Learn array basics</li> <li>2. Declare arrays and perform compile-time initialization of array elements</li> <li>3. Access elements of an array</li> <li>4. Become familiar with methods of the Array class</li> <li>5. Write methods that use arrays as parameters</li> <li>6. Write classes that include arrays as members and instantiate user-defined array objects</li> <li>7. Work through a programming example that illustrates the chapter's concepts</li> </ol>	
8	<p>In this chapter we will cover the more advanced set of C# Collections:</p> <ul style="list-style-type: none"> <li>• Create two-dimensional arrays including rectangular and jagged types</li> <li>• Use multidimensional arrays</li> <li>• Use the ArrayList class and the List class to create dynamic lists</li> <li>• Learn about the predefined methods of the String class</li> <li>• Be introduced the other collection classes</li> <li>• Work through a programming example that illustrates the chapter's concepts</li> </ul>	
9	<ol style="list-style-type: none"> <li>1. Differentiate between the functions of Windows applications and console applications</li> <li>2. Learn about graphical user interfaces</li> <li>3. Become aware of some elements of good design</li> <li>4. Use C# and Visual Studio to create Windows-based applications</li> <li>5. Create Windows forms and be able to change form properties</li> <li>6. Add control objects such as buttons, labels, and text boxes to a form</li> <li>7. Work through a programming example that illustrates the chapter's concepts</li> </ol>	
10	<ul style="list-style-type: none"> <li>• Define, create, and use delegates and examine their relationship to events</li> <li>• Explore event-handling procedures in C# by writing and registering event-handler methods</li> <li>• Create applications that use the ListBox control object to enable multiple selections from a single control</li> </ul>	

WEEK	ACTIVITY	OTHER NOTES
	<ul style="list-style-type: none"> <li>• Contrast ComboBox to ListBox objects by adding both types of controls to an application</li> <li>• Add Menu and TabControl options to Window forms and program their event-handler methods</li> <li>• Wire multiple RadioButton and CheckBox object events to a single event-handler method</li> <li>• Design and create a Windows Presentation Foundation (WPF) application</li> <li>• Work through a programming example that illustrates the chapter's concepts</li> </ul>	
11	<ul style="list-style-type: none"> <li>• Gain an understanding of the different types of errors that are found in programs</li> <li>• Look at debugging methods available in Visual Studio</li> <li>• Discover how the Debugger can be used to find run-time errors</li> <li>• Learn about exceptions, including how they are thrown and caught</li> <li>• Become aware of and use exception-handling techniques to include try...catch...finally clauses</li> <li>• Explore the many exception classes and learn how to write and order multiple catch clauses</li> </ul>	

Students registered with the Centre for Accessible Learning (CAL) who complete quizzes, tests, and exams with academic accommodations have booking procedures and deadlines with CAL where advanced notice is required. Deadlines can be reviewed on the [CAL exams page](http://camosun.ca/services/accessible-learning/exams.html). <http://camosun.ca/services/accessible-learning/exams.html>

## EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING
Lab assignments (10 total)	30%
Midterm Exam	20%
Online quizzes (10 total)	10%
Final practical exam	20%
Final written exam	20%
	<b>TOTAL</b>
	100%

If you have a concern about a grade you have received for an evaluation, please come and see me as soon as possible. Refer to the [Grade Review and Appeals](http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf) policy for more information. <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf>

In addition, in order to pass this course a minimum score of 55% is required on the total of the lab assignments portion and all lab assignments have been submitted. Also a minimum score of 55% is required on the combined final written exam and practical exam is required. For example, if the final practical has 50 marks and the final written has 50 marks, then the combination of the two is 100 marks. You will need to make at least 55/100 to pass. If you do not pass the written exam (say you got 20/50) but you do much better on the practical (35/50), you pass the course.

Failure to write an exam as scheduled earns an automatic grade of F unless an acceptable medical reason is given accompanied by a physician's signed note.

- a. Labs  
Unless otherwise stated in the lab write-up, lab submissions are done through D2L. Late labs are subjected to a 10% penalty (including weekends and holidays), except by the instructor's prior written permission or in the presence of a dire and documented short-term medical or family emergency.
- b. Quizzes  
The quizzes in this course are designed to help the student understand the subject material.
- c. Exams  
No leaving during any examination unless an accommodation in place.

## COURSE GUIDELINES & EXPECTATIONS

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### **Lecture Attendance**

To get the most out of this course, students are expected to attend all classes and be on time. It is your responsibility to acquire all information given during a class missed, including notes, hand-outs, changed exam dates etc.

### **Lab Attendance**

Lab participation is essential to the course objectives, and largely involves discussion of the weekly topic and assigned readings or activities. It is also an opportunity for students to ask questions and learn from each other. The participation grade is assigned based on the level of your constructive engagement in the weekly seminars.

### **Due Dates and Late Assignments**

The due dates are established in accordance with the course and term duration. The purpose of the due dates is to help both you and I to get the assignments done so that they can be assessed in a timely manner. Just as you need time to complete the assignments, I need enough time to grade them. As such, the due dates are fixed (unless you have an approved academic accommodation through CAL) and it is expected that students will hand in assignments on time. Assignment marks, comments, and feedback will be returned to students in a timely manner, usually within 1-3 weeks, depending on the length of the assignment. All assignments must be handed in by the time indicated (on the assignment, or on D2L). Late assignments may be graded but marks equivalent to 10% of the total value of the assignment will be deducted for each day, inclusive of days on the weekend, past the deadline. If assignments have already been marked and returned, a late assignment will not be accepted. Assignments will not be accepted that are late more than three days, inclusive of days over the weekend.

### **Exam Procedures**

All exams must be written at the scheduled times with the exception of students requiring an accommodation by CAL. It is understood that emergency circumstances do occur (e.g. severe illness or family emergency); for such circumstances accommodation may be offered at the discretion of the instructor, provided the student:

- a) notifies the instructor in advance of the exam (not after), and
- b) provides documented evidence of the circumstance (e.g. medical certificate).

If an exam is missed with an excused absence, it is up to the instructor's discretion as to how the mark will be made up. In most cases, an oral exam will be scheduled for the student as soon as possible.

Be sure not to make travel plans for the end of semester until the final exam schedules are finalized and posted. Please ask any family members who might make travel plans on your behalf to consult you before booking tickets.

Please note: the use of cell phones during a test or quiz is not allowed and may result in a zero for that assessment.

### **Study Habits**

Good and regular study habits are essential to do well in this course. You should plan on a weekly minimum of 6 hours outside of scheduled class time for the completion of readings, assignments and for general studying. Joining a study group can help make this more achievable.

Lecture presentations will be uploaded to the course website. These should be used as a study guide, not as your sole source of information. You will need to write down additional key words for examples and explanations given during lecture and review text and videos to support your understanding. It is also recommended practice to transform lecture notes into a study-friendly format after each lecture, incorporating additional information from your textbook. Study these notes before the next class to prepare yourself for new material, which will often build on previously covered material.

Please take advantage of office hours if you need extra clarification and help.

## STUDENT RESPONSIBILITY

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Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

## SUPPORTS AND SERVICES FOR STUDENTS

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Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit <http://camosun.ca/students/>.

Support Service	Website
Academic Advising	<a href="http://camosun.ca/advising">http://camosun.ca/advising</a>
Accessible Learning	<a href="http://camosun.ca/accessible-learning">http://camosun.ca/accessible-learning</a>
Counselling	<a href="http://camosun.ca/counselling">http://camosun.ca/counselling</a>
Career Services	<a href="http://camosun.ca/coop">http://camosun.ca/coop</a>
Financial Aid and Awards	<a href="http://camosun.ca/financialaid">http://camosun.ca/financialaid</a>
Help Centres (Math/English/Science)	<a href="http://camosun.ca/help-centres">http://camosun.ca/help-centres</a>
Indigenous Student Support	<a href="http://camosun.ca/indigenous">http://camosun.ca/indigenous</a>

Support Service	Website
International Student Support	<a href="http://camosun.ca/international/">http://camosun.ca/international/</a>
Learning Skills	<a href="http://camosun.ca/learningskills">http://camosun.ca/learningskills</a>
Library	<a href="http://camosun.ca/services/library/">http://camosun.ca/services/library/</a>
Office of Student Support	<a href="http://camosun.ca/oss">http://camosun.ca/oss</a>
Ombudsperson	<a href="http://camosun.ca/ombuds">http://camosun.ca/ombuds</a>
Registration	<a href="http://camosun.ca/registration">http://camosun.ca/registration</a>
Technology Support	<a href="http://camosun.ca/its">http://camosun.ca/its</a>
Writing Centre	<a href="http://camosun.ca/writing-centre">http://camosun.ca/writing-centre</a>

If you have a mental health concern, please contact Counselling to arrange an appointment as soon as possible. Counselling sessions are available at both campuses during business hours. If you need urgent support after-hours, please contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.

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## COLLEGE-WIDE POLICIES, PROCEDURES, REQUIREMENTS, AND STANDARDS

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### Academic Accommodations for Students with Disabilities

The College is committed to providing appropriate and reasonable academic accommodations to students with disabilities (i.e. physical, depression, learning, etc). If you have a disability, the [Centre for Accessible Learning](#) (CAL) can help you document your needs, and where disability-related barriers to access in your courses exist, create an accommodation plan. By making a plan through CAL, you can ensure you have the appropriate academic accommodations you need without disclosing your diagnosis or condition to course instructors. Please visit the CAL website for contacts and to learn how to get started: <http://camosun.ca/services/accessible-learning/>

### Academic Integrity

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf> for policy regarding academic expectations and details for addressing and resolving matters of academic misconduct.

### Academic Progress

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.1.pdf> for further details on how Camosun College monitors students' academic progress and what steps can be taken if a student is at risk of not meeting the College's academic progress standards.

### Course Withdrawals Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.2.pdf> for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit <http://camosun.ca/learn/fees/#deadlines>.



### Grading Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf> for further details about grading.

### Grade Review and Appeals

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf> for policy relating to requests for review and appeal of grades.

### Mandatory Attendance for First Class Meeting of Each Course

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable reason in advance, you will be removed from the course and the space offered to the next waitlisted student. For more information, please see the “Attendance” section under “Registration Policies and Procedures” (<http://camosun.ca/learn/calendar/current/procedures.html>) and the Grading Policy at <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf>.

### Medical / Compassionate Withdrawals

Students who are incapacitated and unable to complete or succeed in their studies by virtue of serious and demonstrated exceptional circumstances may be eligible for a medical/compassionate withdrawal. Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.8.pdf> to learn more about the process involved in a medical/compassionate withdrawal.

### Sexual Violence and Misconduct

Camosun is committed to creating a campus culture of safety, respect, and consent. Camosun’s Office of Student Support is responsible for offering support to students impacted by sexual violence. Regardless of when or where the sexual violence or misconduct occurred, students can access support at Camosun. The Office of Student Support will make sure students have a safe and private place to talk and will help them understand what supports are available and their options for next steps. The Office of Student Support respects a student’s right to choose what is right for them. For more information see Camosun’s Sexualized Violence and Misconduct Policy: <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.9.pdf> and [camosun.ca/sexual-violence](http://camosun.ca/sexual-violence). To contact the Office of Student Support: [oss@camosun.ca](mailto:oss@camosun.ca) or by phone: 250-370-3046 or 250-3703841

### Student Misconduct (Non-Academic)

Camosun College is committed to building the academic competency of all students, seeks to empower students to become agents of their own learning, and promotes academic belonging for everyone. Camosun also expects that all students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Please review Camosun College’s Student Misconduct Policy at <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.pdf> to understand the College’s expectations of academic integrity and student behavioural conduct.

**Changes to this Syllabus:** Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change courses if it becomes necessary so that

course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.