

CSCI-3132 – Object Orientation and Generic Programming Course Syllabus

Instructor Information

Instructor:	Dr. Khurram Aziz	Office:	Goldberg CS 205
E-mail:	kaziz@dal.ca	Office Hours:	W 10:30-11:30
Class Meeting Time:	TR 08:35-09:55	Room No:	Kenneth Rowe 1009
Tutorial Sessions:	M 10:05-11:25 M 11:35-12:55	Room No:	McCain Arts&SS 2019
Course TA	Reza Rahimi (Reza.Rahimi@dal.ca)		

Course Homepage: <https://dal.brightspace.com/d2l/home/96320>

Important Dates

Refer Academic Calendar (http://www.dal.ca/academics/important_dates.html) for up-to-date info

- Last day to change and add classes: 21-May-2019
- Last day to drop without W: 05-Jun-2019
- Last day to drop with W: 05-Jul-2019
- Final Examination: In the period 31-Jul to 06-Aug-2019
- Deadlines: Four lab assignments due on June 09, June 23, July 07, and July 21
- Quizzes: Five quizzes held in class on May 16, May 30, June 13, July 04, and July 25.

Course Description

This course deals with the fundamental concepts of object-oriented programming: behaviour, inheritance, encapsulation and polymorphism.

C++ will be used as the primary programming language for this course. The course comprises of three overlapping parts. In the first part, students will discover what object-orientation is and how it helps in designing and implementing complex systems. Students will also learn how to create object-oriented design from a given set of requirements. In the second part, students learn object-oriented programming using C++ and discover how it differs from other programming languages. In the third part of the course, students learn about generic programming and how it helps improve modularity and reusability while reducing the amount of code. Note that the three parts are not mutually exclusive and will overlap considerably throughout the course.

Learning Outcomes

On successful completion of this course, students will be able to:

1. Identify key concepts of object-orientation: polymorphism, encapsulation, abstraction and inheritance.
2. Analyze a set of client requirements to identify objects and their relationships and create a high-level design.
3. Create detailed design based on object-oriented design principles.
4. Implement features of object-oriented programming using a high-level language such as C++.
5. Describe the motivation and paradigms of generic programming.
6. Build generic classes using templates.

Curriculum Map

<https://academics.cs.dal.ca/curriculum/manage/course/CSCI/3132>

Prerequisites

CSCI 2110 and CSCI 2132

Evaluation Criteria

- Quizzes (20%)
 - Five quizzes, best 4 would be considered, each worth 5%.
 - Quizzes have to be taken in class only.
- Lab Assignments (20%)
 - Four lab assignments, each worth 5%.
 - Late assignments or assignments that do not compile according to provided instructions will receive a zero grade.
- Class project and presentation (30%)
 - Class project will be completed by students in groups.
 - Design and implementation of the project will be presented by each group in class
- Final Exam (30%)
 - The exam will be scheduled by the university.
 - The exam will cover all material in the course.
- Bonus Marks (up to 5%)
 - In-class competition and on-the-spot Q&A.

***Note** – The grade conversion scale in Section 17.1 of the Academic Regulations, Undergraduate Calendar will be used.*

Recommended Texts and Resources

Textbooks:

1. Bruce Eckel, "Thinking in C++", Vol 1 & 2, 2nd Edition. These can be downloaded free of cost from <http://www.mindviewinc.com/Books/downloads.html>
2. Booch, Maksimchuk, Engle, Young, Conallen, and Houston, "Object-Oriented Analysis and Design with Applications" - 3rd Edition, Addison-Wesley, 2011, ISBN-13: 978-0-201-89551-3
3. Gamma E., Helm R., Johnson R., and Vlissides J., "Design Patterns: Elements of Reusable Object-Oriented Software" Addison-Wesley, 1995, ISBN-13: 978-0-201-63361-0

Other resources may be provided periodically through the course website on Brightspace, if needed.

Course Communications

- Content will be delivered via a combination of lectures, interactive group exercises and labs.
- Students must ask the instructor permission before recording class lectures.
- Course announcements will be posted on the course web page on Brightspace or through the course e-mail list. It is the student's responsibility to check their Dal e-mail and the course web page on a regular basis. If you cannot access the course through Brightspace please contact the CS help desk or read the information located at: <http://www.dal.ca/faculty/computerscience/current.html>

Medical Absences/Sick Notes

Dalhousie University recognizes that students may experience short-term illness or distress that may affect their ability to complete required coursework. If you are absent from class as a direct result of personal illness or distress, please complete the “Student Declaration of Absence” (SDA) form included in the course content on Brightspace and upload it to the appropriate Dropbox within 3 calendar days following your absence.

It is your responsibility to follow up with your instructor or classmates for any class notes/materials that you have missed. If you have missed a test or assignment deadline, please contact me directly.

While there will be no makeup quizzes or tests, the following rules will be applied if you submit the SDA form within 3 calendar days:

- **For missed quizzes:** You will receive either the average of all your other quizzes, or the class average for that quiz, whichever is **lower**. Also note that you already have the option of missing one quiz as best 4 out of 5 will be considered.

Please note that the “Student Declaration of Absence” is **not valid for lab assignments, class project or the final examination**.

Tentative List of Topics

- Expressing client requirements
- Domain modelling, use case and class diagrams
- Object Model, OO Concepts
- C++ programming basics
- Function and operator overloading
- Inheritance and Polymorphism
- Virtual and pure virtual functions
- Generic Programming
- Templates and STL
- Design Patterns

Responsible Computing Policy

Usage of all computing resources in the Faculty of Computer Science must be within the Dalhousie Acceptable Use Policies (<http://its.dal.ca/policies/>) and the Faculty of Computer Science Responsible Computing Policy. (https://www.cs.dal.ca/downloads/fcs_policy_local.pdf)

Use of Plagiarism Detection Software

All submitted code may be passed through a plagiarism detection software, such as Moss (<https://theory.stanford.edu/~aiken/moss/>). If a student does not wish to have their assignments passed through plagiarism detection software, they should contact the instructor for an alternative. Please note that code not passed through plagiarism detection software will necessarily receive closer scrutiny. https://cdn.dal.ca/content/dam/dalhousie/pdf/dept/university_secretariat/policy-repository/OriginalitySoftwarePolicy.pdf

Academic Integrity¹

At Dalhousie University, we respect the values of academic integrity: honesty, trust, fairness, responsibility and respect. As a student, adherence to the values of academic integrity and related policies is a requirement of being part of the academic community at Dalhousie University.

What does academic integrity mean?

Academic integrity means being honest in the fulfillment of your academic responsibilities thus establishing mutual trust. Fairness is essential to the interactions of the academic community and is achieved through respect for the opinions and ideas of others. “Violations of intellectual honesty are offensive to the entire

¹ Based on the sample statement provided at <http://academicintegrity.dal.ca>.

academic community, not just to the individual faculty member and students in whose class an offence occurs." (see Intellectual Honesty section of University Calendar)

How can you achieve academic integrity?

- Make sure you understand Dalhousie's policies on academic integrity.
- Give appropriate credit to the sources used in your assignment such as written or oral work, computer codes/programs, artistic or architectural works, scientific projects, performances, web page designs, graphical representations, diagrams, videos, and images.
- Use RefWorks to keep track of your research and edit and format bibliographies in the citation style required by the instructor <http://www.library.dal.ca/How/RefWorks>
- Do not download the work of another from the Internet and submit it as your own.
- Do not submit work that has been completed through collaboration or previously submitted for another assignment without permission from your instructor.
- Do not write an examination or test for someone else.
- Do not falsify data or lab results.

These examples should be considered only as a guide and not an exhaustive list.

What will happen if an allegation of an academic offence is made against you?

I am required to report a suspected offence. The full process is outlined in the Discipline flow chart, which can be found at:

<http://academicintegrity.dal.ca/Files/AcademicDisciplineProcess.pdf> and includes the following:

1. Each Faculty has an Academic Integrity Officer (AIO) who receives allegations from instructors.
2. The AIO decides whether to proceed with the allegation and you will be notified of the process.
3. If the case proceeds, you will receive an INC (incomplete) grade until the matter is resolved.
4. If you are found guilty of an academic offence, a penalty will be assigned ranging from a warning to a suspension or expulsion from the University and can include a notation on your transcript, failure of the assignment or failure of the course. All penalties are academic in nature.

Where can you turn for help?

- If you are ever unsure about ANYTHING, contact your instructor.
- The Academic Integrity website <http://academicintegrity.dal.ca> has links to policies, definitions, online tutorials, tips on citing and paraphrasing.
- The Writing Center provides assistance with proofreading, writing styles, citations.
- Dalhousie Libraries have workshops, tutorials, citation guides, Assignment Calculator, RefWorks, etc.
- The Dalhousie Student Advocacy Service assists students with academic appeals and student discipline procedures.
- The Senate Office provides links to a list of Academic Integrity Officers, discipline flow chart, and Senate Discipline Committee.

Student Accommodation

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic under the Nova Scotia Human Rights Act. Students who require academic accommodation for either classroom participation or the writing of tests and exams should make their request to the Advising and Access Services Center (AASC) prior to or at the outset of the regular academic year. Please visit www.dal.ca/access for more information and to obtain the Request for Accommodation – Form A.

A note taker may be required as part of a student's accommodation. There is an honorarium of \$75/course/term (with some exceptions). If you are interested, please contact AASC at 494-2836 for more information.

Please note that your classroom may contain specialized accessible furniture and equipment. It is important that these items remain in the classroom, untouched, so that students who require their usage will be able to participate in the class.

Culture of Respect²

Every person has a right to respect and safety. We believe inclusiveness is fundamental to education and learning. Misogyny and other disrespectful behaviour in our classrooms, on our campus, on social media, and in our community is unacceptable. As a community, we must stand for equality and hold ourselves to a higher standard.

What we all need to do:

1. **Be Ready to Act:** This starts with promising yourself to speak up to help prevent it from happening again. Whatever it takes, summon your courage to address the issue. Try to approach the issue with open-ended questions like “Why did you say that?” or “How did you develop that belief?”
2. **Identify the Behaviour:** Use reflective listening and avoid labeling, name-calling, or assigning blame to the person. Focus the conversation on the behaviour, not on the person. For example, “The comment you just made sounded racist, is that what you intended?” is a better approach than “You’re a racist if you make comments like that.”
3. **Appeal to Principles:** This can work well if the person is known to you, like a friend, sibling, or co-worker. For example, “I have always thought of you as a fair-minded person, so it shocks me when I hear you say something like that.”
4. **Set Limits:** You cannot control another person’s actions, but you can control what happens in your space. Do not be afraid to ask someone “Please do not tell racist jokes in my presence anymore” or state “This classroom is not a place where I allow homophobia to occur.” After you have set that expectation, make sure you consistently maintain it.
5. **Find or be an Ally:** Seek out like-minded people that support your views, and help support others in their challenges. Leading by example can be a powerful way to inspire others to do the same.
6. **Be Vigilant:** Change can happen slowly, but do not let this deter you. Stay prepared, keep speaking up, and do not let yourself be silenced.

University Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and the Senate.

<https://academiccalendar.dal.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=69&chapterid=3457&loaduserredits=False>

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity. http://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie’s centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of: a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (NS, NB, PEI, NFLD). http://www.dal.ca/campus_life/student_services/academic-support/accessibility.html

Student Code of Conduct

² Source: Speak Up! © 2005 Southern Poverty Law Center. First Printing. This publication was produced by Teaching Tolerance, a project of the Southern Poverty Law Center. Full “Speak Up” document found at: <http://www.dal.ca/dept/dalrespect.html>. Revised by Susan Holmes from a document provided April 2015 by Lyndsay Anderson, Manager, Student Dispute Resolution, Dalhousie University, 902.494.4140, lyndsay.anderson@dal.ca www.dal.ca/think.

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/student-life-policies/code-of-student-conduct.html

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness (Strategic Priority 5.2). <http://www.dal.ca/cultureofrespect.html>

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit the office in the McCain Building (room 3037) or contact the programs at elders@dal.ca or 902-494-6803 (leave a message).

Learning and Support Resources

- General Academic Support — Advising
http://www.dal.ca/campus_life/student_services/academic-support/advising.html
- Fair Dealing Guidelines
<https://libraries.dal.ca/services/copyright-office/guidelines/fair-dealing-guidelines.html>
- Dalhousie University Library <http://libraries.dal.ca/>