



THE UNIVERSITY OF WINNIPEG

SCIENTIFIC COMPUTING
PHYS-2102-052 U2022W
Winter 2022-23

Course Information

Lecture/Lab meeting times: Mon., 18:00 – 21:00

Lecture/Lab meeting room: 2L14

Refer course outline, or <https://nexus.uwinnipeg.ca> course page

Contact information:

Instructors Ali Ajmi (lecture & lab)

Office 2C27

Email a.ajmi-ra@uwinnipeg.ca

Office hours Immediately after class, or by appointment

Important dates:

09 Jan. 2023: First class of this course in winter term

17 Jan. 2023: Last date of course-drop-out with refunds.
FINAL DATE to pay all fees for the 2023

20 Jan. 2023: Winter Term without a late payment fee being charged.

19-25 Feb. 2023: Winter Term Reading Week. No classes.

20 Feb. 2023: LOUIS RIEL DAY University closed.

27 Feb. 2023: Mid-Term Exam

14 Mar. 2023: FINAL DATE to withdraw without academic penalty from the Winter Term courses

03 Apr. 2023: (Probably) Last lecture of this course

04 Apr. 2023: “LECTURES END for the 2023 Winter Term”

07 Apr. 2023: GOOD FRIDAY: University closed.

10-21 Apr. 2023: The Winter Term evaluation period.

TBA Final Exam

Course Materials

Required textbook:

- *Programming Principles and Practice using C++*, by Bjarne Stroustrup

Required Softwares:

- gcc compiler, a text editor
- ROOT (to be required later during the course)

This being a hands-on course in the Computer-Lab, regular following of the class lectures, in-class exercises, and doing the assignments are strongly advised.

Other materials if/as necessary will be uploaded to either Nexus or nextcloud, and informed in the class.

Evaluation Criteria

The final grades of the students will be calculated from the following components:

- Weekly Assignments 40%

- In-class exercises 5%
- Midterm Exam 20%
- Final Exam 35%

In-class exercises are mandatory in order to get credit for this course. (Exception: If one is feeling sick, one must avoid attending the class in person, and must notify beforehand if/as applicable.) Masks are optional as of now, but will abide by the University rules as/when implemented.

Assignments – There will be approximately one assignment per week to be posted on nexus.uwinnipeg.ca and students will have one week to complete each one and submit to nexus.uwinnipeg.ca in pdf versions.

The guidelines for conversion from numerical (percentage) grades to letter grades are as follows:

Letter Grade	Percentage	Letter Grade	Percentage
A+	95–100	C+	61–66
A	87–94	C	53–60
A–	80–86	D	50–52
B+	74–79	F	0–49
B	67–73		

Note that the above are guidelines and that final grades shall be approved by the Physics Department Review Committee and may be subject to change.

Topics to be Covered

Course outline: The following topics are expected to be covered to the extent allowed by time or other constraints.

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|---|---|
| <ul style="list-style-type: none"> • Fundamentals of Programming, Introduction to C++ • Inputs/Outputs, Strings/Variables Assignment • Operators and Statements • Conditions and Loops • Computation and Logic Building • Graphics/Plotting | <ul style="list-style-type: none"> • Arrays and Matrices • Functions and Standard Libraries • Files Operations • Comparing C and C++ (if time permits) • Introducing ROOT (if time permits) • Data Plotting and Fitting (if time permits) |
|---|---|

All topics may not be covered or/and other topics may be added or substituted as deemed necessary.

Notes from instructors

- Lectures – Students are expected to attend all the lectures IN-PERSON, however if one is feeling ill, one must avoid attending the class in person and inform as early as possible. A zoom connection to follow the class online will be arranged on request, and the exercises to be followed on their laptops simultaneously, as will be instructed.

Students are advised to follow each class regularly, and are very welcome to get their doubts/queries (if any about the topic taught) clarified, latest before the next class. If a student fails to attend a particular class for some inevitable reason, one is strongly advised to either discuss the lessons taught in class with their fellow-students or ask the instructor and work on the exercises suggested, for their own ease of understanding, so as to be prepared for the next topic to be taught in class.

- Assignments – There will be one assignment per week approximately that will be posted on nexus.uwinnipeg.ca and students will have one week to complete each one. **Late assignments receive a mark of zero – no exceptions.** Assignments must be submitted to nexus.uwinnipeg.ca in **pdf versions**. Specific instructions, if any will be posted on the Nexus page.
- Respect – Please respect your colleagues’ right to their education by silencing your cellphone during the lectures.
- **Academic Integrity** – You are expected to take academic integrity very seriously and be mindful of your own activities and the requests/offers you may receive from others.

In addition to the guidelines in the Academic Calendar (Regulations and Policies, Subsection 8a), for all assessment items in this course, the following are considered cheating, plagiarism, or academic misconduct:

- Copying from another student’s work and submitting it as your own (group or collaborative work approved by the instructor is not considered cheating).
- Consulting or copying from any unauthorized sources, including, but not limited to: the Internet; online calculators and graphing tools; assignments or tests/exams from previous years or from other courses; solutions provided by a third party (purchased or otherwise).
- Asking questions from another student or any unauthorized person during the exams and tests.
- Using any unauthorized sources during the tests and exams. Soliciting and obtaining solutions to the assignments, tests, and exams via any means of communication (e.g., e-mail, text, phone call, social media chats, etc.).
- Providing test or exam questions and/or solutions to another student, uploading them to a filesharing website, or otherwise sharing them outside the course.

It is your responsibility to know the policies and guidelines, and to be aware of the academic misconduct procedures. Anybody involved in the process could be charged with academic misconduct. For more information, please see the Academic Calendar, Regulations and Policies, Subsection 8a. <https://uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf>.

Notes from the Dean

1. A permitted or necessary change in mode of delivery may require adjustments to important aspects of course outlines, like class schedule and the number, nature, and weighting of assignments and/or exams.
2. Students can find answers to frequently asked questions (FAQ) related to University Services and updates during the COVID-19 pandemic here: <https://www.uwinnipeg.ca/covid-19/index.html>.
3. When it is necessary to cancel a class due to exceptional circumstances, I will make every effort to inform students via uwinnipeg email (and/or using the preferred form of communication, as designated in this outline), as well as the Departmental Assistant and Chair/Dean.
4. Students are reminded that they have a responsibility to regularly check their uwinnipeg e-mail addresses to ensure timely receipt of correspondence from the University and/or their course instructors.
5. Please note that withdrawing before the VW date does not necessarily result in a fee refund.
6. The first day of class is **Jan 04, 2023**. Last class will be held on **Tuesday, Apr. 04, 2023**. The winter term evaluation period is Apr. 07 - 21, 2023.

[See <https://www.uwinnipeg.ca/academics/calendar/docs/dates.pdf> for all dates].

7. **Regulations, Policies, and Academic Integrity.** Students are encouraged to familiarize themselves with the “Regulations and Policies” found in the University Academic Calendar at: <https://uwinnipeg.ca/academics/>

[calendar/docs/regulationsandpolicies.pdf](#). Particular attention should be given to subsections 8 (“Student Discipline”), 9 (“Senate Appeals”), and 10 (“Grade Appeals”).

Please note the importance of maintaining academic integrity, and the potential consequences of engaging in plagiarism, cheating, and other forms of academic misconduct.

Even “unintentional” plagiarism, as described in the UW Library video tutorial “Avoiding Plagiarism” (<https://www.youtube.com/watch?v=UvFdxRU9a8g>) is a form of academic misconduct.

Similarly, uploading essays and other assignments to essay vendor or trader sites (filesharing sites that are known providers of essays for use by others who submit them to instructors as their own work) is a form of misconduct, as it involves “aiding and abetting” plagiarism. More detailed information can be found here:

Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-procedures.pdf>.

8. **Respectful Learning Environment.** Students are expected to conduct themselves respectfully on campus and in the learning environment irrespective of platform being used. Behaviour, communication, or acts that are inconsistent with a number of UW policies (e.g. Respectful Working and Learning Environment Policy <https://www.uwinnipeg.ca/respect/respect-policy.html>, Acceptable Use of Information Technology Policy <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/acceptable-use-of-information-technology-policy.pdf> could be considered “non-academic” misconduct. More detailed information can be found here: Non-Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-procedures.pdf>. Instructors whose mode of delivery includes Zoom or a similar platform should clarify expectations for appropriate “remote classroom” behaviour or decorum (being on time, muting/unmuting, raising hand, reacting, etc.), and make appropriate allowances in order to respect the privacy of students (e.g. clarifying need to have video on/off).
9. **Copyright and Intellectual Property.** Course materials are the property of the instructor who developed them. Examples of such materials are course outlines, assignment descriptions, lecture notes, test questions, and presentation slides—irrespective of format. Students who upload these materials to filesharing sites, or in any other way share these materials with others outside the class without prior permission of the instructor/presenter, are in violation of copyright law and University policy. Students must also seek prior permission of the instructor/presenter before, for example, photographing, recording, or taking screenshots of slides, presentations, lectures, and notes on the board. Students found to be in violation of an instructor’s intellectual property rights could face serious consequences pursuant to the Academic Misconduct or Non-Academic Misconduct Policy; such consequences could possibly involve legal sanction under the Copyright Policy (https://copyright.uwinnipeg.ca/docs/copyright_policy_2017.pdf).
10. **Research Ethics.** Students conducting research interviews, focus groups, surveys, or any other method of collecting data from any person, including a family member, must obtain research ethics approval before commencing data collection. Exceptions are research activities done in class as a learning exercise. For submission requirements and deadlines, see <http://www.uwinnipeg.ca/research/human-ethics.html>.
11. **Privacy.** Students should be reminded of their rights in relation to the collecting of personal data by the University (<https://www.uwinnipeg.ca/privacy/admissions-privacy-notice.html>), especially if Zoom is being used for remote teaching (<https://www.uwinnipeg.ca/privacy/zoom-privacy-notice.html>) and testing/proctoring (<https://www.uwinnipeg.ca/privacy/zoom-test-and-exam-proctoring.html>).

University of Winnipeg Senate Regulations

1. Students will not be asked for identification when writing a test or examination.

2. A basic scientific calculator will be allowed in exams. No dictionaries, or handheld memory devices (cell phones) will be allowed in exams.
3. Regarding the date of the last test/exam or the due date for the last item of work, such as an essay or project, be advised that Senate does not allow term tests to be administered during the 12th week of regularly scheduled classes (i.e. during the last 3 hours of the course); such tests must be administered during the exam period (the two weeks, or so, following the 12th week of lectures). However, the last item of work (e.g. research paper, essay) may be submitted at the last class, or at a specified time up to and including the scheduled final examination date. Lab exams may be held during the 12th week and on the days between the last scheduled class and the final exam period.
4. Students may choose not to attend classes or write examinations on holy days of their religion, but they must notify their instructors at least two weeks in advance. Instructors will then provide opportunity for students to make up work examinations without penalty. A list of religious holidays can be found in the 2021-22 Undergraduate Academic Calendar.
5. Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., note-takers) are encouraged to contact Accessibility Services (AS) at 204-786-9771 or accessibilityservices@uwinnipeg.ca to discuss appropriate options. All information about a student's disability or medical condition remains confidential <http://www.uwinnipeg.ca/accessibility>.
6. Reference to the appropriate items in the Regulations & Policies section of the Course Calendar, including Senate appeals and academic misconduct (e.g. plagiarism, cheating) <http://uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf> Instructors should become familiar with the procedures for dealing with alleged academic misconduct at <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-procedures.pdf>
7. All students, faculty and staff have the right to participate, learn, and work in an environment that is free of harassment and discrimination. The UW Respectful Working and Learning Environment Policy may be found online at <http://www.uwinnipeg.ca/respect/>