

CS 1027A: Computer Science Fundamentals II

Fall 2021

Course Outline

1. Course Information

Lecture Schedule

| | | |
|---|--|---------|
| Section 001 (LEC) <i>Prof. Sarlo</i> | Mondays 11:30am to 1:30pm Wednesdays 11:30am to 12:30pm | MC-105B |
| Section 002 (LEC) <i>Prof. Morey</i> | Mondays 3:30pm to 5:30pm Wednesdays 3:30pm to 4:30pm | PAB-106 |

Lab Schedule

| | | |
|-------------------|-----------------------------|---------|
| Section 003 (LAB) | Wednesdays 1:30pm to 2:30pm | HSB-16 |
| Section 004 (LAB) | Tuesdays 7:30pm to 8:30pm | MC-235 |
| Section 005 (LAB) | Mondays 9:30am to 10:30am | MC-235 |
| Section 007 (LAB) | Thursdays 3:30pm to 4:30pm | MC-235 |
| Section 008 (LAB) | Thursdays 4:30pm to 5:30pm | TEB-454 |
| Section 009 (LAB) | Thursdays 5:30pm to 6:30pm | TEB-454 |

List of Prerequisites

CS 1025A/B or CS 1026A/B (ES 1036A/B engineering students), with a mark of at least 65% in either. You cannot do either course concurrently with this course.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

| Instructors | Email | Office | Office Hours* |
|-------------------------------------|--|--------|----------------------|
| Bryan Sarlo (Course Coordinator) | bsarlo@uwo.ca | MC 361 | Thursdays 3pm to 5pm |
| Jim Morey | jmorey2@uwo.ca | MC 362 | Tuesdays 3pm to 5pm |

| Teaching Assistants (TAs) | Email | Office Hours* |
|---------------------------|--|---------------|
| Ruizhi Pu | rpu2@uwo.ca | TBD |
| Chandrika Saha | csaha@uwo.ca | TBD |
| Soudeh Nilforoushan | snilforo@uwo.ca | TBD |

Students must use their Western (@uwo.ca) email addresses when contacting their instructors or TAs. Include the course code (CS1027) in the subject line of emails you send regarding this course.

*Office hours will be held on Zoom at least for the month of September. The format may be re-assessed at the end of September for the remainder of the semester. If there are changes at that time, they will be announced in class and/or on OWL.

3. Course Syllabus, Schedule, Delivery Mode

Course Description

A continuation for both Computer Science 1025A/B and Computer Science 1026A/B. Data organization and manipulation; object-oriented principles; abstract data types and their implementations in a modern programming language; lists, stacks, queues, trees; recursion; file handling and storage.

Course Learning Outcomes

- Program in an object-oriented language, namely Java
- Create classes and using inheritance for sub-classes
- Differentiate arrays and linked data structures
- Implement and use abstract data types, i.e. stacks, queues, lists, and trees
- Debug code and use exceptions to handle bugs gracefully
- Identify the different parts of memory during the execution of a Java program
- Program algorithms from pseudo-code or a set of instructions

Lecture Topic Schedule

| Approximate Date(s) | Topic(s) |
|---------------------|------------------------------------|
| Sept. 8 | Course Overview |
| Sept. 13 & 15 | Object-Oriented Programming |
| Sept. 20 & 22 | Inheritance |
| Sept. 27 & 29 | Memory; Exceptions; Debugging, I/O |
| Oct. 4 | Collections; Generics |
| Oct. 4 & 6 | Linked Data Structures |
| Oct. 13 | Stacks |
| Oct. 18 | Queues |

| | |
|-------------------|---|
| Oct. 20 | ** Possible Midterm Review Session ** (time permitting) |
| Oct. 25 & 27 | Lists; Comparable; and Iterable |
| Nov. 8 & 10 | Analysis of Algorithms |
| Nov. 15 | Memory Management |
| Nov. 15 & 17 | Recursion |
| Nov. 22 & 24 & 29 | Trees; Binary Search Trees |
| Dec. 1 & 6 | Sorting |

Lab Topic Schedule

| Lab # | Week | Topic(s) |
|--------|-------------------|----------------------------|
| Lab 1 | Sept. 20 – 24 | Classes; objects; comments |
| Lab 2 | Sept. 27 – Oct. 1 | Inheritance |
| Lab 3 | Oct. 4 – 8 | Debugging; exceptions |
| Lab 4 | Oct. 11** – 15 | Linked Data Structures |
| Lab 5 | Oct. 18 – 22 | Stacks |
| Lab 6 | Oct. 25 – 29 | Queues |
| Lab 7 | Nov. 8 – 12 | Comparable; OrderedLists |
| Lab 8 | Nov. 15 – 19 | Static; string equality |
| Lab 9 | Nov. 22 – 26 | Recursion |
| Lab 10 | Nov. 29 – Dec. 3 | Trees |

** October 11 is Thanksgiving which is a statutory holiday so the university will be closed. You will be contacted around that time if you are registered in the Monday lab section.

Key Sessional Dates:

Classes begin: September 8, 2021

Reading Week: November 1–7, 2021

Classes end: December 8, 2021

Classroom Mask Policy

Students will be expected to wear triple layer non-medical masks at all times in the classroom as per Western policy and public health directives. Students who are unable to wear a mask for medical or religious reasons must seek formal accommodation through Accessible Education at aew@uwo.ca.

Students are expected not to eat or drink while in class to ensure masks stay in place. Students will be able to eat and drink outside of the classroom during scheduled breaks.

Students unwilling to wear a mask as stipulated by Western policy and public health directives will be referred to the Department, and such actions will be considered a violation of the student Code of Conduct.

Contingency plan for an in-person class pivoting to 100% online learning

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

4. Course Materials

There is a required online textbook (ZyBooks) which includes interactive diagrams, examples, and quiz questions along with written text. 5% of your overall course grade will come from the completion of the activities in the ZyBooks.

Note that if you took this course previously and subscribed to the ZyBooks at that time, you do not have to pay again! You have to email support@zybooks.com and let them know that you previously paid and want to subscribe to the new textbook that has the code: UWOCOMPSCI1027ABFall2021.

For everyone else who hasn't previously subscribed to the ZyBooks for CS1027, please follow these steps:

1. Sign in or create an account at <http://learn.zybooks.com>
2. Enter zyBook code: UWOCOMPSCI1027ABFall2021
3. Subscribe

Students are responsible for checking the course OWL site (<http://owl.uwo.ca>) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. The OWL site for this course is labelled "COMPSCI 1027A 001 FW21" regardless of which section you are in. The two sections share the same OWL site.

If students need assistance with the course OWL site, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Technical Requirements

You are required to have a modern laptop or desktop computer that can run an up-to-date version of Java and an IDE such as Eclipse. You must also have a reliable internet connection.

Office Hours are going to be held on Zoom at least for the month of September, if not the entire term, so it is recommended that you have a working microphone and webcam to join the office hours when you have a question.

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

| | |
|----------------------------|-----|
| Assignments (4 at 8% each) | 32% |
| Labs (10 at 1% each) | 10% |
| Midterm Test | 16% |
| Final Exam | 37% |
| ZyBooks Work | 5% |

Assignments

There are four assignments that require you to apply the topics you learned from the lectures and/or labs and combine several concepts in order to complete the project.

All assignments are due via OWL at 11:55pm on the due date unless stated otherwise. If an assignment has to be cancelled by the instructors for any reason, the remaining assignments will be re-weighted to add up to 32%.

Late Policy on Assignments: 10% penalty per day up to 2 days late. Assignments will not be accepted more than 2 days after the due date and will be graded as 0. If you are ill or have another valid reason to not be able to complete an assignment by the due date, you must obtain accommodations from your academic counsellor or a self-reported absence (SRA), and then send an email to the instructor to follow up. This will give you an extension (generally 48 hours) to complete the assignment.

Re-submissions are allowed but note that re-submissions after the deadline will be penalized for being late, regardless of when the initial submission was made.

Assignments will be submitted through Gradescope (not OWL) unless otherwise stated. You have free access to Gradescope as a Western student. Steps to submit on Gradescope will be explained in more detail closer to the deadline of the first assignment.

A portion (typically about 50%) of each assignment's grade will come from auto-graded tests and the rest come from programming style, formatting, logic, comments, etc. The tests are provided so you can run them locally as well, but it is your responsibility to ensure the tests are running and passing on Gradescope in order to get those marks (if they pass on Eclipse but not on Gradescope, you will not get those marks).

Assignments are to be done individually, not in groups. The submitted code is run through a similarity-checking software to look for cheating. Do not copy or share code in any way.

Tentative Assignment Due Dates:

| | |
|--------------|----------------------|
| Assignment 1 | Wednesday, October 6 |
| Assignment 2 | Thursday, October 28 |
| Assignment 3 | Tuesday, November 16 |
| Assignment 4 | Monday, December 6 |

Labs

Lab instructions will be available on the course website in advance. It is expected that students will come prepared to the labs by reading the instructions and performing any preparatory work in advance.

- There are 10 weekly labs which should each take 1 hour or less to complete.
- The labs begin the week of September 20-24.
- You must attend the lab section in which you are registered. You cannot attend a different lab section even if you have a valid reason to miss your scheduled lab. You will receive a mark of 0 if you try to attend a different lab section.
- Each completed lab is worth 1% of your final grade.
- To receive credit for a lab, you must complete the lab work during the schedule slot and submit the completed .java files on OWL by the end of the day in which you had your scheduled lab.
- Coming to your scheduled lab section with the work already complete is not permitted. You will receive a mark of 0 if you try to do this.
- The labs are generally pass/fail, however you could get a mark of 0.5 if you completed about half of the required work, or if you forget to upload the files on OWL after attending your lab.
- If you are ill or have another valid reason to not be able to complete a lab, you must obtain accommodations from your academic counsellor or a self-reported absence, and then send an email to the instructor to follow up. The weight of accommodated missed labs will be shifted to the final exam. Labs that are missed without accommodations will be given a grade of 0 and will not be re-weighted.
- It is your responsibility to sign the TA's attendance sheet and to show your completed lab work to them before leaving the lab room.

Midterm Exam

The midterm exam is scheduled for Friday, October 22 from 7:00pm to 9:00pm. More information will be determined closer to that time and announced in class and/or on OWL.

The makeup midterm exam is scheduled for Monday, October 25 from 7:00pm to 9:00pm. The makeup midterm will only be given to those who did not write (or even begin writing) the original midterm, and who have proper accommodations to write it. This means you have to submit an SRA (self-reported absence) or obtain accommodations from academic counselling (i.e. for an illness or religious reasons) to miss the original midterm and instead write the makeup midterm. The format of the makeup may not necessarily be the same as the original midterm.

The midterm exam is expected to cover the following topics (this is tentative and there could be very minor changes to this list depending on our timing):

- OOP
- Inheritance
- Exceptions

- Error checking
- Collections; Generics
- Linked Data Structures
- Stacks

Final Exam

The final exam will be scheduled by the University. The exam period is from December 10 to 21 and the exact date, time, and location for our exam will likely be announced in October or November.

The final exam is cumulative meaning it covers topics from the entire semester. However, the post-midterm topics, which are listed here, are typically more prevalent than pre-midterm topics on the final exam:

- Queues
- Lists; Comparable; Iterable
- Analysis of Algorithms
- Memory Management
- Recursion
- Trees; Binary Search Trees
- Sorting

Grade Requirements

To be eligible to receive a grade of 50% or higher (i.e. to pass the course), you must achieve:

- at least 45% average between the midterm and final exams, and
- at least 45% average between the four assignments

If you fail to meet **either** of these conditions, your final mark will be either 45% or your calculated grade, whichever is lower.

To be eligible to receive a grade of 65% or higher (i.e. to be eligible to go on in a Computer Science module), you must achieve:

- at least 50% average between the midterm and final exams, and
- at least 50% average between the four assignments

If you fail to meet **either** of these conditions, your final mark will be either 60% or your calculated grade, whichever is lower.

Accommodated Evaluations

Accommodations are handled differently depending on the assessment type, as outlined below. Note that for any of these accommodations, you must submit a self-reported absence (SRA) or receive approval from academic counselling. You must follow up with the instructor of your section of the

course within two days of obtaining the accommodation to confirm that it has been received. Failure to follow up within two days may result in the accommodation being void.

Labs – accommodations for a missed lab results in the lab weight being shifted to the final exam

Assignments – accommodations for an assignment results in a 48-hour extension (or longer if academic counselling recommends a longer extension).

Midterm – accommodations for missing the midterm results in the opportunity to write the make-up midterm. If the make-up midterm is also accommodated, the weight of the midterm will be shifted to the final exam.

Final Exam – accommodations for missing the final exam results in the opportunity to write the make-up final exam. Note that SRAs **cannot** be used for the final exam.

6. Student Absences

Academic Consideration for Student Absences

Students who experience an extenuating circumstance (illness, injury or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

- (i) Submitting a Self-Reported Absence (SRA) form provided that the conditions for submission are met. To be eligible for a Self-Reported Absence:
 - an absence must be no more than 48 hours
 - the assessments must be worth no more than 30% of the student's final grade
 - no more than two SRAs may be submitted during the Fall/Winter term
- (ii) For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to the Academic Counselling office of their Faculty of Registration.
- (iii) Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration.

Note that in all cases, students are required to contact their instructors within 24 hours of the end of the period covered, unless otherwise instructed in the course outline.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For the policy on Academic Consideration for Student Absences – Undergraduate Students in First Entry Programs, see:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf

and for the Student Medical Certificate (SMC), see:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

Absences from Final Examinations

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under [Special Examinations](#)).

6. Accommodation and Accessibility

Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD), which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf,

7. Academic Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

No electronic devices (including phones, calculators, etc.) are permitted on the midterm or final exam.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Computer-marked multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Code submitted for labs, assignments, and/or exams may be run through comparison-checking software such as MOSS to look for cases of cheating.

In the event of a lock-down or an unexpected mandate to hold tests online rather than in person, they would be conducted using a remote proctoring service such as Proctorio. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at:

<https://remoteproctoring.uwo.ca>.

8. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at (519) 661-2147 if you have any questions regarding accommodations.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual

support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Students who are in emotional/mental distress should refer to Mental Health@Western (<http://www.health.uwo.ca/mentalhealth>) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.