

*LAND ACKNOWLEDGEMENT. The School of Computer Science at the University of Windsor sits on the Traditional Territory of the Three Fires Confederacy of First Nations. We acknowledge that this is the beginning of our journey to understanding the Significance of the history of the Peoples of the Ojibway, the Odawa, and the Pottawatomie.*

COMP-4400 Principles of Programming Languages (Winter 2024)

*School of Computer Science, University of Windsor*

Lectures: Monday 2:30 - 5:20 (EH 105)

Instructor: Dr. J. Chen

Office: L.T. 8100

Telephone: 253-3000 ext. 3713

Office Hours: Tu. 11:30 - 12:30, 1:00 – 2:00 (refer to the course webpage for possible changes)

E-mail: xjchen@uwindsor.ca

- Comments to the course should be directed to the course instructor.
- Compared to e-mails, office hours should be used as primary method of communication.
- Only emails originated from a valid University of Windsor student account will be accepted from students wishing to contact the instructor. The email correspondence should provide student name, student ID, and course code. The students are not allowed to spam with multiple or lengthy emails.
- If the feedback to the email inquiries is not received, the student should reach out to the instructor during the office hours.

*GA/TA Information*

Please refer to the Brightspace for the GA/TA contact information and office hours.

*Pre-requisites:*

COMP-2120, COMP-2140, COMP-2310, COMP-2540, COMP-3300.

*Lectures*

The lectures are planned to cover the following major components:

- a) classification of programming languages
- b) prolog and logic programming
- c) Scheme and  $\lambda$ -calculus
- d) parallel and concurrent programming
- e) operational semantics
- f) type and type checking

g) polymorphism

The instructor reserves the right to change the outline in response to the learning curve of the students. The topics described above are tentative and the depth and the order of the presentation are subject to change at the discretion of the instructor according to the learning pace of the students.

*Recommended Textbooks and Some Online Resources*

- 1) M. Fernandez. *Programming Languages and Operational Semantics*. King's College. 2004. Leddy Library Course Reserves: ZPR960 .B004
- 2) G. Michaelson. *An Introduction to Functional Programming Through Lambda Calculus*. Dover Publications. 2011. Leddy Library Course Reserves: ZPR960 .B003
- 3) Severio Perugini. *Programming Languages - Concepts and Implementation*. 1st edition. Jones and Bartlett Learning. 2023.
- 4) Robert W. Sebesta. *Concepts of Programming Languages*. 10th Edition. Pearson. 2013. Leddy Library Course Reserves: ZPR960 .B005
- 5) R. Kent Dybvig. *The Scheme Programming Language*. 4th edition. [www.scheme.com](http://www.scheme.com)
- 6) Web site to download Racket: <http://download.racket-lang.org>
- 7) Web site to download GNU Prolog: <http://www.gprolog.org>
- 8) online Prolog execution environment: <http://swish.swi-prolog.org>
- 9) Cuda C++ programming guide. <https://docs.nvidia.com/cuda/cuda-c-programming-guide/index.html>
- 10) course web page: [brightspace.uwindsor.ca](http://brightspace.uwindsor.ca)

*Evaluation Scheme*

unannounced quizzes	1% * 5	During lectures
home assignments	8% + 3% + 3% + 8% + 8%	
midterm exam	25%	Friday, Mar. 1st, 1:00 - 2:30
final exam	40%	TBD

A numeric grade on a scale of 0 to 100 will be assigned (rounded integer). For undergraduate students, a minimum grade of 50% is required to pass this course. For graduate students, a minimum grade of 70% is required.

Quizzes will be multiple choice questions.

All home assignments must be uploaded into the Brightspace before they are due. No e-mail submission will be accepted. Late submissions will receive 10% deduction if they are submitted within 24 hours after the deadline, and 50% deduction if they are submitted within 3 days after the deadline. No assignments will be graded if they are received more than 3 days after the deadline. The weight of an assignment could be transferred to that of the final exam if there is a valid reason for not being able to complete it in time.

The exams will cover all material already introduced in the course.

There will be no make-up of the midterm test. The weight of a missed midterm could be transferred to that of the final exam if there is a valid reason for missing the test.

The make-up of the final exam will be scheduled for a student only if there is a valid reason for missing the exam.

No alternate considerations will be given to any missed assessment if the instructor is not informed within 3 calendar days after its due date. The instructor will refuse any unsubstantiated or late requests.

### *Appeals*

Informal appeals of the marks for assignments (except for the last one) will be considered only if they are received within 10 days after the release of the corresponding grades. Informal appeals of the marks for the last assignment will be considered only if they are received within 5 days after the release of the corresponding grades. Informal appeals of the marks for midterm will be considered only if they are received before the last week of the lectures. Informal appeals of the marks for the final exam will be considered only if they are received before or during the office hours set up for the final exam review.

### *Content Confidentiality*

Lectures, quizzes, assignments and examinations given in this course are protected by copyright. Reproduction or dissemination of the course material in any manner (e.g., sharing content with other students or websites) without permission of the instructor is strictly prohibited. Students who violate this rule will be subject to disciplinary action under [Senate Bylaw 31](#): Student Affairs and Integrity.

### *Recording of Lectures*

Interaction within the class is an essential part of the course and will be strongly encouraged. Paying respect to the privacy of the students, video recording of the lectures is generally not allowed. If permission to record a lecture is given to a student, the instructor will inform the class of this before the lecture, and the student is not allowed to post or share any recorded material to any other individual or party outside this course. See [Senate Policy on recording lectures](#).

### *Learning Outcome*

At the end of the course, the successful student will know and be able to:

- Explain key concepts of programming languages.
- List paradigms of programming languages and their characteristics.
- Write correct terms in lambda calculus and carry out reductions in lambda calculus.
- Describe semantics of conventional programs, using formal notations.
- Identify and describe new developments in programming languages.
- Describe the pros and cons of declarative and imperative programming languages.

- Read and write programs in functional and logic programming languages.
- Communicate with programmers effectively using concepts in programming languages.

#### *Student Perceptions of Teaching*

The Student Perceptions of Teaching (SPTs) forms will be administered in the last two weeks of classes. Students will be provided with up to 15 minutes at the beginning of a class to complete the SPTs online.

#### *Support Contacts:*

- For CS Tutors (free tutoring support for all CS undergrad courses): <http://tutor.cs.uwindsor.ca/>
- For Computer Science Society: <https://css.uwindsor.ca/>
- For CompSci undergraduate programs and advising, including IT certificate: [csinfo@uwindsor.ca](mailto:csinfo@uwindsor.ca)
- For CompSci graduate programs (MSc, MSc-AI stream, and PhD): [csginfo@uwindsor.ca](mailto:csginfo@uwindsor.ca)
- For CompSci professional graduate programs (MAC/MAC-AI stream): [macprogram@uwindsor.ca](mailto:macprogram@uwindsor.ca)
- For the office of the Director of the School of Computer Science: [csdir@uwindsor.ca](mailto:csdir@uwindsor.ca)
- For CompSci technical support: <https://help.cs.uwindsor.ca/>
- For Student Accessibility Services: <https://www.uwindsor.ca/studentaccessibility/>
- For other general inquiries: <https://ask.uwindsor.ca/>
- For student counselling services (ext. 4616): <https://www.uwindsor.ca/studentcounselling/>
- For student health services (ext. 7002): <https://www.uwindsor.ca/studenthealthservices/>
- For student Peer Support Centre (ext. 4551): <https://www.uwindsor.ca/studentexperience/wellness/>
- For USci Faculty of Science student support network: <https://www.uwindsor.ca/science/usci/>

*Good2Talk* provides free, 24/7, single-session professional counselling and referral by phone to post-secondary students in Ontario. Services are provided in English and French, with translation services available in 100+ languages.

- Call: 1-866-925-5454 (reach professional counsellors)
- Text: GOOD2TALKON to 686868 (reach trained volunteers)

*Wellness Together Canada* provides free, 24/7 professional mental health and substance use counselling by phone to anyone in Canada and Canadians abroad. Service is provided in English and French, with translation services available by request.

- Call: 1-866-585-0445 (reach professional counsellors)
- Text: WELLNESS to 686868 (reach trained volunteers)

#### *Students with Disability:*

Students who require academic accommodations in this course due to a documented disability must contact an Advisor in Student Accessibility Services (SAS) to complete SAS Registration and receive the necessary Letters of Accommodation. After registering with SAS, the student must present the Letter of Accommodation and discuss the needs with the course instructor as early in the term as possible. Deadlines for the submission of documentation and completed forms to SAS are available at <http://www.uwindsor.ca/studentaccessibility/>

#### *Academic Integrity*

The following behaviours will be regarded as cheating:

- Copying assignments or quizzes or presenting someone else's work as your own.
- Allowing another student to copy an assignment/project from you and present it as their own work.
- Copying from another student or any other unauthorized source during a test or exam.
- Falsifying your identity during the exam or having someone else assist or complete your assessment.
- Referring to notes, textbooks, and any unauthorized sources during a test or exam (unless otherwise stated).
- Not sitting at the pre-assigned seat during a test or exam.
- Communicating with another student in any way without permission during a test or exam.
- Having unauthorized access to the exam/test paper prior to the exam/test.

- Explicitly asking a proctor for the answer to a question during an exam/test.
- Modifying answers after they have been marked.
- Any other behaviour which attempts unfairly to give you some advantage over other students during the grade-assessment process.
- Refusing to obey the instructions of the officer in charge of an examination.

The list given above is not exhaustive. More examples are given in Appendix A, [Senate Bylaws 31](#).

The instructor will report any suspicion of academic integrity to the Director of the School of Computer Science. If sufficient evidence is available, the Director will begin a formal process according to the University Senate Bylaws. Complete guidelines and procedures on the sanctions imposed by the university are listed in Table A.1 of the [Senate Bylaws 31](#).

#### *Equity, Diversity, and Inclusiveness (EDI)*

This course is, without question, a safe place for students of all races, genders, sexes, ages, sexual orientations, religions, disabilities, and socioeconomic statuses. Disrespectful attitude, sarcastic comments, offensive language, or language that could be translated as offensive and/or marginalize anyone are absolutely unacceptable. Immediate actions will be taken by the instructor to protect the safety and comfort of the students. An ethnically rich and diverse multi-cultural world should be celebrated in the classroom. The instructor will treat every student equally and with the respect and compassion that all students deserve. Furthermore, UWindsor is committed to combatting sexual misconduct. All members are required to report any instances of sexual misconduct, including harassment and sexual violence, to the [Sexual Misconduct Response & Prevention Office](#) so that the victim may be provided appropriate resources and support options.

- <https://www.uwindsor.ca/sexual-assault/>
- For police/ambulance emergency call 911 (in Canada)
- For campus police call 519-253-3000 ext. 4444 for emergency, and 1234 for non-emergency issues.

#### *Generative AI tools*

Students cannot use Generative AI tools (e.g., ChatGPT, Bard) to produce assignments or reports. Any submitted assignments must be the students' own work.