Programming Languages: Theory and Practice

CIS 352 at Syracuse University — Spring 2026

Kristopher Micinski, CIS352 Professor

Note: Parts of this syllabus are subject to change with adequate notice to students. Changes will be notated (last changed: **January 10, 2026**).

1. Course Description

An introduction to the design and implementation of programming languages, focused on operational semantics, interpreters, and proofs of correctness. This course includes a mix of code synthesis (writing new code), code comprehension (explaining or debugging existing code), and various technical skills. A specific emphasis will be placed upon training in algorithmic thinking, programming, and debugging strategy.

2. Instructors

Instructors:

- Kris Micinski, Asst. Prof at Syracuse ECS
  - Office hours (office location: CST 4–185):
    - **Tuesday** 3:30 – 4:30 PM
    - **Wednesday** 2 – 4 by appointment (schedule via email)
    - **Thursday** 3:30 – 4:30 PM
    - **Friday** by appointment (Zoom)
    - See the email policy below.
  - Naveen Ashok, TA, nashok@syr.edu.
  - Jin Yang, TA, jyang142@syr.edu.
  - Up-to-date TA office hours will be posted on course webpage / Blackboard.
  - TA office hours location TBA, email TA if uncertain.

3. Grading

- 60% — Best three of four in-person exams
  - **Midterms:** Three midterms, each worth 20%. Focus topics will be announced via electronic announcement (Blackboard, email) several days before the exam. Students are allowed a handwritten, two-sided, US letter-sized note sheet.
  - **Final Exam:** Comprehensive, slightly longer than the midterms, worth 20%. The lowest exam grade drops (effectively replaced); students are encouraged to skip the final if they are otherwise happy with their exam grades.
- 30% — Programming Homeworks / Exercises. **4–6 individual programming homeworks**, along with (potentially) several smaller exercises. See the **important AI usage policy below**; in brief, unrestricted AI usage on homeworks is allowed with caveats.
- 5% — Written Homeworks. There will be roughly 2–4 written homework assignments distributed throughout the term, weighted equally unless stated otherwise. These will largely occur later in the term to give more conceptual practice.
- 5% — Participation quizzes.
- Up to 4% — Bonus points

3.1. Final Letter Grading Bars

Final grades will be assigned as follows. A small "bump" (0–2 points usually, uniformly applied to the total course grade) may be given in practice, but is not guaranteed. The value of the bump, if any, will be announced near end of the course (before the final).

- A – 92%
- A- – 90%
- B+ – 87%
- B – 83%
- B- – 78%
- C+ – 74%
- C – 70%
- C- – 65%
- D – 60%
- $<$D – $<$60%

3.2. Course Tags

The university recommends instructors label their courses with shared competencies. We intend for this course to fit the following:

- Critical and Creative Thinking
- Scientific Inquiry and Research Skills

3.3. Office Hours

Office hours will be *drop-in* on **Tuesdays** and **Thursdays** after class for 1 – 1.5 hours, as interest dictates. During drop-in office hours I will often triage student questions, generally handling questions on a first-come first-serve basis, but will sometimes reorder or group questions if some students are working on similar things. On **Wednesdays**, I will have office hours from 2–4PM which will generally be *by appointment* (email kkmicins@syr.edu). These times will be reserved for students in CIS352 who email me personally (24 hours notice please); during times where there is no interest, the professor reserves the right to use the time for other work-related activities (such as meetings with PhD students). The professor will also generally be available via Zoom on Fridays with notice.

4. Monday Labs

Monday labs are optional, and may sometimes contain bonus credit activities (which count towards the 4% maximum extra credit points). Otherwise, the Monday labs will be used either for TA office hours or extra discussion of relevant topics (of the TA and professor's choosing) as deemed useful to students.

5. Topics

Topics include the following, based on pacing and course progression:

- Functional Programming
- Racket / Scheme
- Algebraic Data
- Direct-style recursion
- Tail recursion
- Accumulation via loops, recursion, and `foldl/r`
- Closures
- Pattern Matching
- Untyped Lambda Calculus
- Simply-Typed Lambda Calculus

- Polymorphism
- Natural Deduction
- Operational Semantics
- Control operators and continuations
- Pencil-and-paper proofs of program correctness
- Code comprehension and debugging intuition
- Objects, Classes, and Object-Oriented Programming
- Dependent types
- Rust and ownership

6. Academic Drop Deadline

As part of our efforts to track satisfactory academic progress, the Academic Drop Deadline and the Financial Drop deadline will both occur on Monday, Feb 2, 2026. Students may still withdraw from courses after these deadlines; this would place a 'WD' grade on their transcripts.

7. Autograder Homeworks (30%)

There are 4–6 *individual programming homeworks* in Racket. While I will assign the final grade from these projects at the end of the semester, you will be given an account on an *autograder*, to which you may submit your assignments. You will receive credentials for the autograder (let the professor know if not received by the second week of class). You must learn Git to use the autograder. I will cover the Autograder in class—if you have not used it before, I recommend getting help from one of the TAs, they will assist you in how to set it up. The individual programming homeworks are to be completed individually, unless otherwise stated. AI usage *is* permitted, under some circumstances (see below).

The instructor will also plan to assign various programming *exercises*. These exercises will be smaller than the larger project-sized homeworks, and will be clearly labeled. You may work with anyone, including a team of students, to solve these exercises.

7.1. Homework Late Policy

- Homeworks turned in within 72 hours of the deadline will receive a 15% penalty. Homeworks turned in after 72 hours and until the end of the course will receive a 25% penalty.
- **No** one-off project extensions will be granted without a good reason. The late policy is already liberal. A single late submission likely will not change the final course grade.

- The instructor will move homework deadlines for religious observances, excused medical absence, or similar unforeseen circumstances. Please email to discuss.

8. Written, In-Person Exams (60%)

In-person, written exams measure your ability to produce solutions regarding relevant course content in an open-ended fashion. There will be four exams: three midterms and one final. Each of the exams will include a mix of code synthesis / comprehension and also technical topics from the course. Questions (broad topics) of focus for exams will be announced several days before the exam, and the instructor will post a practice exam, which will be covered in class the day before the exam. Each midterm will be worth 20%, and will take 80 minutes to complete. There will also be a final exam, scheduled for 120 minutes: the grade of the final exam will replace the lowest of the other two midterm grades.

Exams can be stressful; students may wish to look into the resources provided by the Barnes Center (such as extended exam time). I am happy to accommodate exam-related needs but request at least 72 hours notice for each exam so that I can arrange for testing center materials if needed.

9. Written Homeworks (5%)

There will be 2–4 written homework assignments, to be submitted either via Blackboard or on paper to the TAs. These homeworks will all be weighted equally, and will be dispersed at irregular intervals throughout the term. They will primarily stress writing-based skills (such as pencil-and-paper proofs). These will be announced with specific policies and grade guidelines dictated on a per-assignment basis. By default, you should assume that the AI usage policy on written homeworks is as follows: using AI in a limited basis is okay, but you should be focusing on course materials (slides, reading, lectures) to understand the foundations. You should be driving the solution yourself and using it to practice writing answers for the exams.

10. Participation Quizzes (5%)

5% of the course grade will be given to participation quizzes. Participation quizzes will be hosted through Socrative. These participation quizzes will be irregular, intended to encourage course attendance. Participation quizzes will be weighted equally. Grading will be as follows: students who receive a participation rate of 70% will receive the full 5% credit, while students who achieve a lower participation quiz will receive a grade of $(g + .3) * 5\%$, where $g \in [0, 1]$ is their total participation grade (all quizzes weighted equally).

11. Bonus Credit (up to 4%)

There will be occasional bonus credit opportunities of varying percentages, whose point value will be decided on a per-assignment basis. You may achieve up to 4% bonus points

throughout the course, which applies on top of all other course grades (participation quizzes, written homeworks, programming homework, and exams).

12. Academic Integrity and Generative AI Policy

As a pre-eminent and inclusive student-focused research institution, Syracuse University considers academic integrity at the forefront of learning, serving as a core value and guiding pillar of education. Syracuse University's Academic Integrity Policy provides students with the necessary guidelines to complete academic work with integrity throughout their studies. Students are required to uphold both course-specific and university-wide academic integrity expectations such as crediting your sources, doing your own work, communicating honestly, and supporting academic integrity. The full Syracuse University Academic Integrity Policy can be viewed by visiting the Syracuse University Policies website.

Upholding Academic Integrity includes the protection of faculty's intellectual property. Students should not upload, distribute, or share instructors' course materials, including presentations, assignments, exams, or other evaluative materials without permission. Using websites that charge fees or require uploading of course material (e.g., Chegg, Course Hero) to obtain exam solutions or assignments completed by others, which are then presented as your own violates academic integrity expectations in this course and may be classified as a Level 3 violation. All academic integrity expectations that apply to in-person assignments, quizzes, and exams also apply online.

Students found in violation of the policy are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered. Students may not drop or withdraw from courses in which they face a suspected violation. Any established violation in this course may result in course failure regardless of violation level.

All academic integrity expectations that apply to in-person quizzes and exams also apply to online quizzes and exams. In this course, all work submitted for quizzes and exams must be yours alone. Discussing quiz or exam questions with anyone during the quiz or exam period violates academic integrity expectations for this course.

If a student is found in violation of the policy (by the academic integrity coucnil), I, as the instructor of CIS352, reserve the right to impose *any* grade-related sanction I see fit, up to and including course failure.

12.1. Generative AI Policy

The following is option 2 of Syracuse University's required generative AI policy language:

Based on the specific learning outcomes and assignments in this course, artificial intelligence is permitted on the following: all programming homeworks. See each assignment, quiz, or exam instructions for more information about what artificial intelligence tools are permitted and to what extent, as well as citation requirements. If no instructions are provided for a specific assignment, then no use of any artificial intelligence tool is permitted. Any AI use

beyond that which is detailed in course assignments is explicitly prohibited except when documented permission is granted.

12.2. Rules and Advice Specific to CIS352

Short answer: AI-assisted programming is completely allowed on course homeworks, without restrictions, provided that you also include a document *in your repository* titled *ai-usage.txt*. In this file, you should clearly state how the AI was used and you should include your specific prompts, including how the AI was used. This file will be relevant, because in cases of apparent copying (e.g., two students with duplicate code), these files will differentiate similar-looking implementations from different efforts.

In previous iterations of CIS352 I had a detailed AI usage policy designed to discourage pervasive AI usage. Now I have changed my mind: you should embrace AI-assisted programming to whatever degree it helps you personally grow you learning. I have written a long blog post detailing my personal thoughts at `https://kmicinski.com/claude-code-and-why-study-cs`. To give you the short version: AI-assisted programming is a current-day reality, but it still has shortcomings and you will not a high-quality end-to-end product unless you truly understand the fundamentals. As students of CIS352, my advice is to use *any* means necessary to rapidly build your mental model and challenge yourself on the complex technical ideas in the class. You should be careful to make sure you practice the basics—the AI is often so capable that we are tempted to avoid the boring or tedious elementary work, but avoiding this will sometimes lead to failure to develop core skills. Remember, the focus in this class is on how to write complex, small programs, not boring, large programs. Thus, it is especially important to focus on the correctness of each line of code.

12.3. My Use of Generative AI

I, as the instructor, may use generative AI tools to help develop course materials such as editing code related to class examples, developing technical examples (e.g., programs) or visualizations, and more generally to be aware of the power of generative AI tools as they pertain to the rapidly-evolving needs of software engineering professionals. When I do, I take full responsibility for reviewing and verifying all AI-generated content to ensure it is accurate, appropriate and aligned with our learning objectives. All final course materials represent my professional judgment about what will best support your learning.

The above was a blanket statement (which I tailored a bit) provided by the university, but I agree with it. I myself believe that AI tools have now reached a degree of utility which is impossible to deny, but we still bear the professional responsibility of ensuring that AI does not turn our content into slop. I myself use Claude (for example Claude Code) to perform routine command-line tasks, but also for more complex software engineering work in a variety of settings. For example, I found AI assistants particularly helpful in refactoring some aspects of the course website (e.g., to rearrange the schedule without touching the HTML code)–this helps me optimize my time to deliver more one-on-one time with students. If you have any concerns or questions surrounding generative AI usage, please email me to discuss.

13. Email Policy

- Please include "CIS352" in your email subject.
- FERPA requirements prohibit discussing grades or other course records on any non-university platform.
- Thus, please keep all written course communication to university-provided email, and no other platform. We may use Zoom for meetings if helpful / necessary.
- For official business (notifications of course absence due to illness, etc.), please email me, even if we discuss in person.
- I aim to respond to all course-related email within a business day. I may not be able to reply during the evening or on weekends. In the event there is an urgent need, please feel free to email me again after a business day.

14. Student Support

Syracuse University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. There may be aspects of the instruction or design of this course that result in barriers to your inclusion and full participation in this course. I invite any student to contact me to discuss strategies and/or accommodations (academic adjustments) that may be essential to your success and to collaborate with the Center for Disability Resources (CDR) in this process.

If you would like to discuss disability accommodations or register with CDR, please visit Center for Disability Resources. Please call (315) 443-4498 or email `disabilityresources@syr.edu` for more detailed information.

15. Accreditation and Use of Student Work

As part of the regular ABET accreditation process for the undergraduate program in computer science, we may be collecting samples of students' work in each of our undergraduate classes. Some of your labs/homeworks/exams may be photocopied or electronically copied for accreditation at some later point. When doing so, your name and other personally-identifying information will be scrubbed.

16. Faith Tradition Observances

Syracuse University's Religious Observances Policy (link) recognizes the diversity of faiths represented in the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to their traditions. Under the policy, students are given an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance, provided they notify their instructors no later than the academic drop deadline. For observances occurring before the drop deadline, notification is required at

least two academic days in advance. Students may enter their observances in MySlice under `Student Services/Enrollment/My Religious Observances/Add a Notification`.

17. Student Mental Health

Mental health and overall well-being are significant predictors of academic success. As such, it is essential that during your college experience you develop the skills and resources effectively to navigate stress, anxiety, depression, and other mental health concerns. Please familiarize yourself with the range of resources the Barnes Center provides at https://ese.syr.edu/bewell and seek out support as needed. Counseling services are available 24/7, 365 days a year, at 315.443.8000.

18. Disability Statement

Syracuse University values access and inclusion; we are committed to a climate of mutual respect and full participation. There may be aspects of the instruction or design of this course that result in barriers to your inclusion and full participation in this course. I invite any student to contact me to discuss strategies and/or accommodations (academic adjustments) that may be necessary to ensure equitable access, and to collaborate with the Center for Disability Resources (CDR) in this process.

If you would like to discuss disability-related accommodations or register with CDR, please visit Center for Disability Resources. Please call (315) 443-4498 or email CDRspecialist@syr.edu for more detailed information.

CDR is responsible for coordinating disability-related academic accommodations and will work with the student to develop an access plan. Since academic accommodations are generally not provided retroactively, please contact CDR as soon as possible to initiate this process.

19. Discrimination and Harassment

The University does not discriminate and prohibits harassment or discrimination related to any protected category including creed, ethnicity, citizenship, sexual orientation, national origin, sex, gender, pregnancy, reproductive health decisions, disability, marital status, political or social affiliation, age, race, color, veteran status, military status, religion, sexual orientation, domestic violence status, genetic information, gender identity, gender expression or perceived gender.

Any complaint of discrimination or harassment related to any of these protected bases should be reported to Sheila Johnson-Willis, the University's Chief Equal Opportunity & Title IX Officer for Faculty and Staff. She is responsible for coordinating compliance efforts under the various laws including Titles VI, VII, IX and Section 504 of the Rehabilitation Act. She can be contacted at Equal Opportunity, Inclusion, and Resolution Services, 621 Skytop Road,

Suite 1001, Syracuse University, Syracuse, NY 13244-1120; or by email: equalopp@syr.edu; or by telephone: 315-443-4018.

Federal and state law, and University policy prohibit discrimination and harassment based on sex or gender (including sexual harassment, sexual assault, domestic/dating violence, stalking, and sexual exploitation). If a student has been impacted by any prohibited behavior based on sex or gender, they can obtain confidential counseling support, 24-hours a day, 7 days a week, from the Sexual and Relationship Violence Response Team at the Counseling Center (315-443-8000, Barnes Center at The Arch, 150 Sims Drive, Syracuse, New York 13244). Incidents of sexual or relationship violence or harassment can be reported to the University's Title IX Coordinators (Sheila Johnson Willis, Chief Equal Opportunity Officer and Title IX Officer for Faculty and Staff, 315-443-4018, equalopp@syr.edu or Pamela Peter, Director/Coordinator of Student Title IX Case Management, 315-443-0211, titleix@syr.edu). Reports to law enforcement can be made to the University's Department of Public Safety (315-443-2224, 005 Sims Hall), the Syracuse Police Department (511 South State Street, Syracuse, New York, 911 in case of emergency or 315-435-3016 to speak with the Abused Persons Unit), or the State Police (Campus Sexual Assault Victims Unit, 844-845-7269). I will seek to keep information you share with me private to the greatest extent possible, but as a professor I have mandatory reporting responsibilities to share information regarding sexual misconduct, relationship violence, stalking, harassment, and crimes I learn about with the University's Title IX Officer to help make our campus a safer place for all and to ensure you have access to available resources.