Instructor - Sean Mackay (DEH 243 snmackay@ou.edu)

Teaching Assistant – Ziyu Wang (you.wang-1@ou.edu)

Class Meetings - Nielsen Hall 0170, 9-10:15 AM (Tues/Thurs)

Office Hours – Dr. Mackay - Monday @ 12:10-2pm (starting week 2) in DEH 243

Dr. Mackay - Wednesday @ 2-4:30pm (starting week 2) in DEH 243

(some other dates may be online via Zoom, and will be announced via email in advance).

Ziyu Wang - Tuesday/Thursday @ 11am-12pm (starting week 2) via Zoom:

https://oklahoma.zoom.us/j/95323955576?pwd=ZGb1PbNV9mxmLDuwlO0JTmfRjRhMKH.1

Course Website - Access through https://canvas.ou.edu

Delivery Method - The course will be delivered by standard in-person lectures. Lectures will also be recorded and shared with students via Canvas. Class recordings must only be used as a complementary learning aid, and not as a replacement for live lectures (synchronous). Recordings may not capture all the material covered, and recordings do corrupt at times, and days may not be posted. **Recordings MAY NOT be reposted or shared by any other means,** and only the instructor will have the authority to share media content beyond the scope of this course. Course materials such as slides, example files, sketches, and assignment instructions will be available for download in Canvas and **may not** be distributed (are considered property of the instructor and the University of Oklahoma). You are responsible for ensuring you have met all the material covered during lectures.

NOTE: EMAIL is the primary form of communication for this class. Anything sent via email is to be considered a part of this class. You are responsible for checking your University of Oklahoma email at least once per day. This is good practice for your other courses as well.

All necessary Zoom links, if applicable, will be posted to Canvas. Depending on weather, classes may move online (up to university policy).

Attendance Policy - In-person attendance is mandatory and highly encouraged. Questions via Tophat will be given starting in the first week Thursday. They will not be graded until week 2. Typically, students who routinely attend class and have been seen taking notes have scored ~1 letter grade higher than their peers who do not.

Integrity - By taking this course, attending lectures, submitting quizzes and assignments, and taking the exams, you acknowledge that you have not sought external help, beyond reasonable means, to any question or graded problem. Furthermore, it is strictly prohibited to search for help by posting assigned graded questions to online sites and similar resources.

Cheating is strictly prohibited at the University of Oklahoma, because it devalues the degree you are working hard to get. As a member of the OU community, it is your responsibility to protect your educational investment by knowing and following the rules. For specific definitions on what constitutes cheating, review the Students Guide to Academic Integrity can be found at https://www.ou.edu/integrity

Generative AI Policy:

The use of Large Language Models (LLM's) without explicit prior permission for the specific assignment is forbidden and will be considered a violation of course academic integrity policies, resulting in a grade of zero on the assignment. Using AI is forfeiting your creative sensibilities, your professional agency, and your unique perspective as a human individual that gives your solutions to problems unique qualities.

When you are allowed to use AI you must:

1. CITE the AI you used.
2. Provide the prompt history used.
3. Explain what the AI contributed to your understanding of the problem, your solution, and why you used it.

Textbook - No required book. However, different topics will be covered from the following books:

- Robert W. Sebesta. 2012. Concepts of Programming Languages (10th ed or 11th ed)*, Addison Wesley. (ISBN: 978-0-13-139531-2).

*11th edition is the preferred book

Required Work - The final grade consists of:

- **Tophat Questions (10%)** – Each class there will be a free text response submission on Tophat. At some point during the lecture, you will be asked to provide your answers to a question within the slides. We will then discuss the correct solution. Your attendance is necessary to earn these points. 50% of the points will be for submitting, 50% will be for correctness.

- **Programming Homeworks (15%)** – A series of three (3) programming homeworks will be given throughout the semester and will be due via Gradescope (assignments will be on Canvas and will have clickable submission links). Please pay attention to Canvas for due dates and specifics.
- **Written Homeworks (10%)** - A series of 5 written homeworks will be given throughout the semester, aligning with key theoretical topics covered in class. These homeworks will serve as good practice for your midterm and final exams. Release and due dates are provided in the schedule (bottom) but are subject to change. Assignments will be found on Canvas and due on Gradescope.

- **Language Project (25%)** – You will develop the components of an interpreted programming language based on a language specification document through three project components. You will have 2-3 weeks for each portion, with deadlines throughout the project. See Canvas for specific dates and details. Details will be discussed as they come about.

  Late Policy: The project consists of 3 parts with deadlines. Part 1 and part 2 will have deadlines with the ability to submit AFTER the deadline has passed. However, these late submissions will only be eligible for at most 80% of the points one could have originally earned. Part 3's submission is the final submission for the project and has a hard deadline. No submissions after this deadline will be accepted.

  Note that once you have submitted a version for part 1 and part 2 you will have the opportunity to continue to revise it for the final submission with NO point penalty. **For example:** Let's say you submit a partially working solution for Part 1 by the deadline. You will earn a placeholder score wherein the max points you could have earned is 100% for part 1. You will then be able to submit still, and your final grade will be based on the final submission. However, should you not submit for part 1 by the deadline, then the max points you can earn from part 1 ever is 80%. This is to ensure that you start work on this project early and ask for help as needed early.

- **Midterm (15%)** – The midterm will be during class-time (see course schedule for the date). The exam will be closed-book and on paper.

- **Final Exam (25%)** – The final exam is scheduled for Friday, May 15th from 8-10am in Nielsen Hall 0170 (our classroom). The exam will be closed-book on paper. The exam is cumulative and does not just cover material learned after the midterm.

Grading:

The following table indicates the number to letter grade mapping I will use to assign letter grades at the end of the course. I reserve the right to adjust the letter grade cut-offs. If adjustments are made they will be adjusted lower (in your favor). Note that this is not the standard scale you will typically see, and this is reflected in overall assignment difficulty.

A	**88-100**
B	**73-87**
C	**59-72**
D	**50-58**
F	**0-49**

Learning Outcomes: -

- Introduction to theoretical foundations and paradigms of programming languages.
- Topics you will learn include:
    - Functional programming
    - Underlying semantics of other paradigms such as OOP, Imperative
    - The OCaml programming language
    - lexical analysis
    - syntax analysis
    - syntax-directed translation
    - type systems and semantics
    - intermediate code generation
    - memory management.

ABET Specific Outcomes of Instruction - By the end of the semester, the students will be able to apply computer science theory and software development fundamentals to produce computing-based solutions. For more information, see https://www.abet.org/ . These include:

1. Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

University Policies

Mental Health Support Services

Support is available for any student experiencing mental health issues that are impacting their academic success. Students can either been seen at the University Counseling Center (UCC) located on the second floor of Goddard Health Center or receive 24/7/365 crisis support from a licensed mental health provider through TimelyCare. To schedule an appointment or receive more information about mental health resources at OU please call the UCC at 405-325-2911 or visit University Counseling Center. The UCC is located at 620 Elm Ave., Room 201, Norman, OK 73019.

Title IX Resources and Reporting Requirement

The University of Oklahoma faculty are committed to creating a safe learning environment for all members of our community, free from sex-based discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking, in accordance with Title IX. There are resources available to those impacted, including: speaking with someone confidentially about your options, medical attention, counseling, reporting, academic support, and safety plans. If you have (or someone you know has) experienced any form of sex-based discrimination or violence and wish to speak with someone confidentially, please contact OU Advocates (available 24/7 at 405-615-0013) or University Counseling Center (M-F 8 a.m. to 5 p.m. at 405-325-2911).

Because the University of Oklahoma is committed to the safety of you and other students, and because of our Title IX obligations, I, as well as other faculty, Graduate Assistants, and Teaching Assistants, are mandatory reporters. This means that we are obligated to report sex-based violence that has been disclosed to us to the Institutional Equity Office. This means that we are obligated to report sex-based violence that has been disclosed to us to the Institutional Equity Office. This includes disclosures that occur in: class discussion, writing assignments, discussion boards, emails and during Student/Office Hours. You may also choose to report directly to the Institutional Equity Office. After a report is filed, the Title IX Coordinator will reach out to provide resources, support, and information and the reported information will remain private. For more information regarding the University's Title IX Grievance procedures, reporting, or support measures, please visit Institutional Equity Office at 405-325-3546.

Adjustments for Pregnancy and Related Issues

Should you need modifications or adjustments to your course requirements because of pregnancy or a pregnancy-related condition, please request modifications via the

Institutional Equity Office website or call the Institutional Equity Office at 405/325-3546 as soon as possible. Also, see the Institutional Equity Office FAQ on Pregnant and Parenting Students' Rights for answers to commonly asked questions.

Reasonable Accommodation Policy

The University of Oklahoma (OU) is committed to the goal of achieving equal educational opportunity and full educational participation for students with disabilities. If you have already established reasonable accommodations with the Accessibility and Disability Resource Center (ADRC), please log into iAdvise to request your semester accommodations as soon as possible and contact me privately, so that we have adequate time to arrange your approved academic accommodations.

If you have not yet established services through ADRC, but have a documented disability and require accommodations, please complete ADRC's pre-registration form to begin the registration process. ADRC facilitates the interactive process that establishes reasonable accommodations for students at OU. For more information on ADRC registration procedures, please review their website. You may also contact them at (405)325-3852 or adrc@ou.edu, or visit www.ou.edu/adrc for more information.

Note: disabilities may include, but are not limited to, mental health, chronic health, physical, vision, hearing, learning and attention disabilities, pregnancy-related. ADRC can also support students experiencing temporary medical conditions.

Religious Observance

It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty. [See Faculty Handbook 3.15.2]

Final Exam Preparation Period

Pre-finals week will be defined as the seven calendar days before the first day of finals. Faculty may cover new course material throughout this week. For specific provisions of the policy please refer to OU's Final Exam Preparation Period policy.

Emergency Protocol

During an emergency, there are official university procedures that will maximize your safety.

Severe Weather: If you receive an OU Alert to seek refuge or hear a tornado siren that signals severe weather.

1. Look for severe weather refuge location maps located inside most OU buildings near the entrances.
2. Seek refuge inside a building. Do not leave one building to seek shelter in another building that you deem safer. If outside, get into the nearest building.
3. Go to the building's severe weather refuge location. If you do not know where that is, go to the lowest level possible and seek refuge in an innermost room. Avoid outside doors and windows.
4. Get in, Get Down, Cover Up
5. Wait for official notice to resume normal activities.

Additional Weather Safety Information is available through the Department of Campus Safety.

The University of Oklahoma Active Threat Guidance

The University of Oklahoma embraces a Run, Hide, Fight strategy for active threats on campus. This strategy is well known, widely accepted, and proven to save lives. To receive emergency campus alerts, be sure to update your contact information and preferences in the account settings section at one.ou.edu.

RUN: Running away from the threat is usually the best option. If it is safe to run, run as far away from the threat as possible. Call 911 when you are in a safe location and let them know from which OU campus you're calling from and location of active threat.

HIDE: If running is not practical, the next best option is to hide. Lock and barricade all doors; turn of all lights; turn down your phone's volume; search for improvised weapons; hide behind solid objects and walls; and hide yourself completely and stay quiet. Remain in place until law enforcement arrives. Be patient and remain hidden.

FIGHT: If you are unable to run or hide, the last best option is to fight. Have one or more improvised weapons with you and be prepared to attack. Attack them when they are least expecting it and hit them where it hurts most: the face (specifically eyes, nose, and ears), the throat, the diaphragm (solar plexus), and the groin.

Please save OUPD's contact information in your phone.

NORMAN campus: *For non-emergencies call (405) 325-1717. For emergencies call (405) 325-1911 or dial 911.*

TULSA campus: *For non-emergencies call (918) 660-3900. For emergencies call (918) 660-3333 or dial 911.*

Fire Alarm/General Emergency

If you receive an OU Alert that there is danger inside or near the building, or the fire alarm inside the building activates:

1. *LEAVE* the building. Do not use the elevators.
2. *KNOW* at least two building exits
3. *ASSIST* those that may need help
4. *PROCEED* to the emergency assembly area
5. *ONCE safely outside, NOTIFY first responders of anyone that may still be inside building due to mobility issues*.
6. *WAIT* for official notice before attempting to re-enter the building.

OU Fire Safety on Campus

Schedule: The following is tentative and is subject to change due to timing, weather, or unforeseen events:

Week	M	T	W	R	F
1 Jan 19th	First day of classes	Lecture 1 Course Introduction		Lecture 2 Intro to Ocaml	
2 January 26th		Lecture 3 Programming in OCaml continued	Programming HW1 Release	Lecture 4 Functional Programming in OCaml continued	
3 Feb 2nd		Lecture 5 Programming in OCaml continued		Lecture 6 Programming in OCaml continued	Programming HW1 Due (tentative)
4 Feb 9th	Programming HW2 Release	Lecture 7 OCaml continued		Lecture 8 OCaml continued	
5 Feb 16th	Programming HW2 Due	Lecture 9 Formal Grammars		Lecture 10 Formal Grammars (RECORDED LECTURE, am attending a conference)	***Grammars HW Release***
6 Feb 23rd		Lecture 11 Formal Grammars	Interpreter Project Released	Lecture 12 Dynamic Semantics	***Grammars HW Due***
7 March 2nd	***Dynamic Semantics HW Release***	Lecture 13 Dynamic Semantics		Lecture 14 Dynamic Semantics Scoping Rules	
8 March 9th	***Dynamic Semantics HW Due***	Midterm Review		Midterm 1	
9 March 16th	**SPRING BREAK**	**SPRING BREAK**	**SPRING BREAK**	**SPRING BREAK**	**SPRING BREAK**
10 March 23rd	***Scoping Rules HW Released***	Lecture 15 Dynamic Semantics & Scoping Rules (TBD, may have extra to cover)	Interpreter Project Part 1 Due	Lecture 16 Subprograms	
11 March 30th	***Scoping Rules HW Due***	Lecture 17 Implementing Subprograms	***Subprograms HW Released***	Lecture 18 Implementing Subprograms	
12 April 6th		Lecture 19 Streams/ Lazy lists	Interpreter Project Part 2 Due	Lecture 20 Concurrency	***Subprograms HW Due***
13 April 13th	***Concurrency HW Released***	Lecture 21 Concurrency		Lecture 22 Concurrency	
14 April 20th	***Concurrency HW Due***	Lecture 23 Language Architecture (the big picture)		Lecture 24 Project Review	Interpreter Project Part 3 Due
15 April 27th	Programming HW3 Released	Lecture 25 Language Architecture (the		Lecture 26 Flex/Padding	

		big picture) also Flex day		(We WILL NEED THIS)	
16 May the 4th be with you	Programming HW3 Due	Final Exam Review		Final Exam Review	
17 May 11th					Final Exam