

3460:689 T: Software Language Engineering Fall 2021

Section 810 76185 Monday and Wednesday 5:15 - 6:30 pm Arts & Sciences (CAS) 130

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Office Hours: Available on the instructor's homepage. Other times are by appointment.

Course Description The basics of description, parsing, querying, validation, and transformation of computing languages for the purpose of reengineering existing software.

- The specific computing languages include: data formats, XML, programming languages, special-purpose languages such as SQL, and general DSLs (Domain-Specific Languages).
- The grammar representations include regex and BNF
- Parsing is via a parsing toolkit, such as Antlr.
- Transformation approaches include regex, tree transformation languages, and XML transformations.

Learning Objectives Students who complete the course can:

- Create a lexer and parser for a simple programming language
- Apply a parsing toolkit, such as ANTLR, to a parsing problem
- Apply regular expressions to match parts of code and use the regex in popular tools
- Create queries to extract information from source code
- Create transformations for reengineering of a software code base

Prerequisites: Graduate Standing **Credits:** 3

Reference Textbooks

Terrence Parr, *Language Implementation Patterns: Create Your Own Domain-Specific and General Programming Languages*, 2010 ISBN 978-1-934356-45-6

Martin Fowler, *Domain Specific Languages*, 2010 ISBN 978-0-321-71294-3

Grading	Exercises	10%	A	≥ 93%	C	≥ 73%
	Projects	20%	A-	≥ 90%	C-	≥ 70%
	Research	20%	B+	≥ 87%	D+	≥ 67%
	Midterm	25%	B	≥ 83%	D	≥ 63%
	Final	25%	B-	≥ 80%	D-	≥ 60%
			100%	C+	≥ 77%	F

Exercises Exercises occur frequently and are 10% of the overall score. Exercises may include a class participation component. Attendance is necessary to receive exercise credit.

Projects Multiple projects are assigned and collectively are 20% of the overall score. Project grades include correctness, readability, design style, quality of design, and application of concepts presented in the course.

Research Paper The course will include a Research Project that will be presented at the end of the semester, and will count for 20% of the overall grade.

Midterm The Midterm Exam is 25% of the overall score. It occurs after the 8th week of the semester, with the specific date announced at least one week before.

Final Exam The Final Exam is in the regular classroom on Wed Dec 8 5:15 - 7:15 pm and is worth 25% of your overall score.

Policies Class instruction uses various sources; web pages, the instructor's web pages, and written on the board. Examples may be entered by the instructor and discussed during class. Attendance is necessary for a complete understanding of the material.

Any source code created for this course is committed to a Git repository created through GitHub Classroom. For credit, the source code must appear in the proper repository.

So that work can be graded and returned promptly, late assignments require a valid excuse. It is up to the student to make up any missed material. Make-ups of any work for this class are given only with an excused absence or a documented, valid emergency. I encourage you to contact me if an emergency arises.

Students whose names are not on the University's official 15-day class list are not permitted to attend class. Consult University information for specific dates and policies regarding the withdrawal policy.

Academic Honesty All submitted work (exercises, projects, and tests) must be your own. Submission of work that is even partly not yours results in a report to the *Office of Student Conduct and Community Standards*.

COVID-19 Policies The COVID-19 pandemic is still present and serious. Before entering class, you should have completed your daily health assessment. You should not come to class if you fail your health check or feel ill. At that time, I also ask you notify me that you will be absent. When campus policies require masks to be worn indoors, all students are required to wear a mask during in-person classes. While you are in class on campus, you are required to: sit in your designated seat, always cough or sneeze into your elbow or a tissue, and adhere to other public safety protocols and directives for your specific classroom/lab/studio. Students who do not follow these health and safety requirements will be instructed to leave class immediately. Students who violate this protocol will need to leave the classroom and MAY be marked absent. Repeated violations of these health-saving protocols may lead to sanctions under the Student Code of Conduct up to and including suspension or expulsion. Current guidelines can be found at: <https://www.uakron.edu/return-to-campus/>.

Special Notice Any student who feels she/he may need an accommodation based on the impact of a disability should contact the Office of Accessibility at 330-972-7928. The office is at 105 Simmons Hall.

The University of Akron is committed to providing an environment free of all forms of discrimination, including sexual violence and sexual harassment. This includes instances of attempted and/or completed sexual assault, domestic and dating violence, gender-based stalking, and sexual harassment. Additional information, resources, support and the University of Akron protocols for responding to sexual violence are available at uakron.edu/Title-IX