Organization of Programming Languages "OPL"

CS 3363

Fall 2020

Instructor Information:

Richard L. Churchill,
Office: Online and by phone. You can arrange one-on-one Zoom meetings with the instructor, or in-person if required.

Class meetings: Mon. and Weds. at 12:30 PM, Thurs. at 2:00 PM. These meetings will be held on Zoom. Invitations to these meetings will be published as announcements on Canvas.

Phone: 405-334-7674
> NOTE: I do not respond to text messages. This is due to FERPA restrictions, making my responding to such messages a violation of Federal law. Use email if you need me to read something. Also, only call me if it is important, as email is the preferred form of communication: it allows me to budget my time across all students better.

E-Mail Address: richard.l.churchill@okstate.edu

Office Hours: By phone Mon through Thurs, 10:00 AM to 4:00 PM. One-on-one and in-person meetings with the instructor can be arranged. Contact the instructor to schedule such meetings.

T.A. Information:

There is no T.A. assigned for this course.

Emails from and to the instructor:

The instructor will use email and Canvas to notify the class and individual students regarding any information about the course at any point in the semester. Students are responsible for the contents of these emails. The email addresses used will be those used on Canvas, which are OSU email addresses. Emails to the instructor should be via the Canvas email system, as this reports emails both in Canvas and via the OSU email system. Be sure you can receive email from **okstate.edu** addresses.

The instructor will endeavor to use subject lines starting with "CS 3363 OPL:" for all emails regarding this course. Please use that same subject/title for emails you send to the instructor and other students in this course, so that recipients can spot important emails. Allow at least a day for a response to any email to the instructor. Complex questions may require somewhat longer due to any research that may be required.

Textbooks:

- Mandatory text
  - ***Concepts of Programming Languages***, Twelfth edition, Robert W. Sebesta, ISBN-13: 9780135102268.
  - *This is an online/digital textbook. A print edition is available if you prefer, but as with all print editions it is expensive. The text is revised since the 11th edition. Some material been revised or removed, and some added. A number of the problems at the ends chapters are different, as well as the ordering of some of the questions relative to past ordering, so prior editions of the text are not appropriate for use in this course.*
  - *Access to the text via https://console.pearson.com/enrollment/77qavs. Access codes may be available from the OSU Bookstore, but may be purchased directly from Pearson at the above link for $24.99.*
- Suggested supplemental text
  - ***Elements of ML Programming***, ML97 edition, Jeffrey D. Ullman, ISBN-10: 0-13-790387-1.
  - *This is an older book that is much easier to find as a used book. It is not necessary, but if you have never used a functional programming language it is useful in that it does a reasonably good job of introducing this paradigm. It has become somewhat scarce with the current lockdowns, but copies are available for less than $11.00 as this syllabus is being written. Other languages used in this course do not have recommended texts and you are free to choose any you find that fits your need. Links to on-line tutorials and texts for those other languages will likely be sufficient for the courses needs.*

NOTE: Make sure you have the 11th or 12th U.S. edition! There are differences between the 11th and 12th editions and all previous editions. There are also differences between these editions, which will be addressed as they arise.

Non-programming assignments will be largely from the mandatory text, as will the publisher's/author's slides. The majority of the instructor's slides will also reference the mandatory text, though additional materials will be included from other sources. The mandatory text in print format may be ordered from the OSU Student Union Bookstore, or from any of a number of on-line retailers. You may consider using **addall.com** to search for a better price, as this Web site searches over 30 on-line sources for availability and price information.

You will have two assignments in ML and additional assignments in LISP, Haskell, Ruby, Python and Prolog. There is no recommended text for these languages. Tutorial material on each of these languages will be posted to Canvas, along with links to material online.

Both LISP and Prolog are language worth knowing. You may wish to find good, inexpensive books on these languages at some point in your career. Haskell is a language with some very interesting features and is used extensively in several areas of computer science research. Ruby has a distinctive approach (a goal of the designer was "no surprises") and should broaden your understanding of the decisions that may be made in the design of languages.

Note that access to the csx server will require use of Virtual Private Network (VPN) software available via the computer science department Web site at http://cs.okstate.edu/loggingon.html. If you have problems accessing the server using the VPN software, contact the department's technical support via

. Note also the reference to PuTTy as a useful tool for accessing the server, and that an FTP utility (such as Core FTP Lite) can also be useful.

Prerequisites for This Course:

Prerequisites for this course include experience programming in at least one commonly used programming language, such as Python, C, C++ or Java. Preferably, you should have completed Programming I and II courses at a college or university. Ideally, you should have taken Theoretical Foundations, but this is not required. If you have questions about your experience, ask the instructor.

Course Objectives:

In this course, we will
- Describe fundamental concepts of programming languages.
- Examine the design issues of various language constructs
   o Examine implementations of these constructs in some of the most common programing languages, and
   o Compare design alternatives.

Roughly speaking
- We study concepts underlying high-level programming languages and different programming paradigms.
- We study how and why different programming languages were developed and their similarities and differences.

Skills and knowledge obtained in this course:
1. Increased capacity to express programming concepts;
2. Background for choosing appropriate languages and language abstractions for solving a given problem;
3. Increased ability to learn new languages, to understand the significance of programming language implementations.

Style/Mode of Teaching:

This is an on-line course. Zoom meetings will be held each week as described above, and you are required to attend at least one each week unless otherwise excused. The assignments are accessed by using Canvas. Non-programming assignments are to be submitted via Canvas drop-boxes, while programming assignments are to be submitted via 'handin' on the department's csx server.

The CS3363, Organization of Programming Languages home page is accessed via the Internet at http://oc.okstate.edu , logging in to Canvas, then clicking the link to this course. The class assignments are in the Content section. Each individual assignment can then be accessed by clicking that assignments link. All of the dates and times when assignments are due will be posted on the Canvas home site.

Graded Materials:

Non-programming Assignments (8 @ 25 points) 200
Mid-term Exams (2 @ 50 points)   100
Final Exam (1 @ 50 points)   50
Programs (7 @ 25 points)   175
Total   525

Assignment Due Dates:

All assignments will be due at 11:59 PM, Stillwater time, on the Saturdays they are due. The first two assignments do not require the textbook. Programming and non-programming assignments alternate, week to week.

> **Assignments cannot be made up if they are missed except under circumstances such as severe illness, family emergency, etc. Contact the instructor if the need to submit an assignment late arises. Such contact should be prior to the deadline for the assignment in all but emergency situations.**

There will be seven (7) programming assignments for this course, plus one "proof of access to csx" assignment for ten (10) points that counts as extra credit. Apart from the "proof of access" assignment, these will be posted to Canvas about two weeks prior to the due date. Programming assignments must be submitted via 'handin' to the department's csx server unless otherwise stated in the assignment document. Late programs (except the last) will be accepted at a 20% penalty for each day late, with any fraction of a day counting as a full day. Thus, a program four days and one second late would count as five days late, and receive no credit. Non-programming assignments must be submitted to the corresponding Canvas folder.

Acceptable Formats for Assignment Submission:

All non-programming assignments must be submitted in one of three formats: an ASCII text file, an Adobe Acrobat .pdf file, or Microsoft Office Word document format (.docx). Do not submit scans of text. You may submit scanned images of graphs, diagrams and such, but text must be submitted in one the file format listed above. You are in a computer science course, and are expected to use the tools that you will be using when you have a job in this field.

Programming assignments must be submitted as properly formatted and documented files of the type required by the language used in the assignment. The programs must compile (or interpret) and execute correctly on the Computer Science Department's csx server. NO POINTS WILL BE AWARDED FOR PROGRAMS THAT DO NOT COMPILE/INTERPRET, OR DO NOT RUN, ON THAT SERVER.

Program documentation must include your name, the assignment name, the course and semester it is for, the instructor's name, the date of submission, the purpose of the program, and all other suitable comments regarding the code contained. A documentation template for each programming language will be provided on the Canvas site.

Grading Policy:

Grades will be assigned based on point totals as follows:

> A: 90-100%
>
> B: 80-89%
>
> C: 70-79%
>
> D: 60-69%
>
> F: < 60%

Examinations:

There are **TWO Mid-term Exams** for this course. The mid-terms will be administered Friday, September 25, and Friday, October 30. The format will be announced at least two weeks prioer to the exams. The **Final Exam** will require proctoring, and will be on Friday, December 11.

For students who can be in Stillwater on test dates for proctored exams, the exams will be administered by the instructor at a time and on-campus location to be posted two weeks prior to each test. If extenuating circumstances apply, alternative arrangements are possible, but students are encouraged to attend the group test session. The group test sessions are usually held at 4:00 PM on the exam date in a room in the MSCS building on the Stillwater campus.

For all other students, proctored exams must be administered by a proctor acceptable to the OSU College of Arts and Sciences Out-reach program office. The current plan is to use an on-line proctoring service such as Examity. If other arrangements are required, students will be informed sufficiently in advance to make any necessary arrangements.

Proctored exams must be completed on the calendar date where the exam is administered.

Students with disabilities may obtain additional time to complete the exam by first obtaining the required endorsements from Student Disability Services. See the Web page at following URL for contact information:

https://apps.okstate.edu/directory/osu/index.php/module/Default/action/ViewFunctionalGroup?group_id=870

Hardware/Software Requirements:

Students are required to have access to the Internet, to be able to read standard Microsoft Office documents (.docx and pptx files) and .pdf files, and to be able to log into and use the Computer Science department's server (csx#.cs.okstate.edu where # is the cluster to be used). They must also be able to submit documents of the appropriate types for all assignments.

Class Attendance:

As this is an on-line course, there are no set class times, other than for the mid-term exams and the final exam. These tests will be administered either by a proctor at a suitable testing site (for those students not in Stillwater on the test dates) or by the instructor, in Stillwater, on the exam dates, or as "take home" exams. (See Examinations above.)

Students are responsible for all assignments posted on the Canvas course site, regardless of the student's physical location. Due dates and times will be posted on the Canvas site. All of the necessary instructions and data files (if any) will be posted with the assignment.

Quizzes:

There are no quizzes for this course.

Projects/Programming Assignments:

Programming assignments are due at the date and time posted in the assignment documents.

> **Programs are severely penalized for being late. The penalty for late program submissions is 20% per day. See above in Assignment Due Dates for more details. Note, though, that getting an assignment in at all is better than not submitting it. You gain nothing from doing nothing.**

Collaboration Policy:

Assignments and Programs: Discussion with classmates and others is allowed, and you should feel free to use the Canvas discussion board. You may not share code. After any such discussion, each student must write up his/her own solution, or implement his/her own program. Copying the work of anyone else, whether a fellow student or any other party, is not allowed and is regarded as cheating. Giving another student your work is considered cheating as well.

> **Students who do not comply with the described collaboration policy will be reported for an Academic Integrity violation to the University and a punishment up to and including F! will be assessed.**

Disabilities Act:

If you feel that you have a disability and need special accommodations of any nature whatsoever, the instructor will work with you and the Office of Disabled Student Services, 315 Student Union, to provide reasonable accommodations to ensure that you have a fair opportunity to perform in this class. Please advise the instructor of such disability and the desired accommodations at some point before, during, or immediately after the first scheduled class day.

Important Dates for Fall 2020 semester:

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
AUG	16	17	18	19	20	21	22
		Class Starts					program 0
	23	24	25	26	27	28	29
							Homework 1
	30	31	1	2	3	4	5
							program 1
SEP	6	7	8	9	10	11	12
		Holiday					Homework 2
	13	14	15	16	17	18	19
							program 2
	20	21	22	23	24	25	26
						Mid-term 1	Homework 3
	27	28	29	30	1	2	3
							program 3
OCT	4	5	6	7	8	9	10
							Homework 4
	11	12	13	14	15	16	17
							program 4
	18	19	20	21	22	23	24
							Homework 5
	25	26	27	28	29	30	31
						Mid-term 2	program 5
NOV	1	2	3	4	5	6	7
						W Drop deadline	Homework 6
	8	9	10	11	12	13	14
							program 6
	15	16	17	18	19	20	21
						W/F Drop deadline	Homework 7
	22	23	24	25	26	27	28
		Fall Break and Holiday					program 7
	29	30	1	2	3	4	5
		DEAD WEEK					Homework 8
DEC	6	7	8	9	10	11	12
		FINALS WEEK					
	13	14	15	16	17	18	19
		Grades reported					