CSCI 117: STRUCTURES OF PROGRAMMING LANGUAGES
Fall 2015

COURSE SYLLABUS

Course Description (revised from catalog)
Concepts, design principles and paradigms of programming languages. Subjects include language implementation, syntax, semantics, type system, scope and binding, run-time environment, exception handling. Paradigms include imperative, object-oriented, functional, concurrent, and logic programming.

Prerequisite: CSCI 41 (Introduction to Data Structures),
           CSCI 60 (Foundations of Computer Science)
Units: 4

Lectures: M, W   2:00 pm – 3:15 pm, McF 208
Lab sessions (managed by TA):   F   10:00 am – 11:50 am,   McF 201
                                       12:00 pm – 1:50 pm,   McF 201

Instructor: Jin H. Park, Ph.D.	**Lab T.A.:** Jimmy Ouyang
Office: Science II, #249	Office: Science II, #260
Office hours: M 3:30 – 5:00 pm	Office hours: T, Th 2:00 pm – 3:00 pm
T, Th 2:00 – 3:30 pm	Phone:
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Text book (available at campus bookstore):
• Robert Sebesta, *Concepts of Programming Languages, 11th Ed.*, Pearson, 2016 (ISBN: 978-0-13-394302-3)
Textbook is easy to read and it is suggested that students should read all the chapters, except Ch.4.

Reference books (students do not have to purchase):
• Scott, *Programming Language Pragmatics, 3rd Ed.*, Morgan Kaufmann, 2009
• Tucker and Noonan, *Programming Languages: Principles and Paradigms, 2nd Ed.*, McGraw-Hill, 2007
• Any Java book that describes Threads and concurrent programming is recommended for reading.

Course Goals and Expected Learning Outcomes:
This course provides computer science undergraduate students essential knowledge and practice in programming languages in various paradigms. Students will design and implement their own programming languages, as well as practicing programs in different paradigms, including object-oriented, functional, concurrent, and logic programming.
At the conclusion of this course, students will be able to:
1) demonstrate an understanding of the design principles of programming languages;
2) demonstrate an understanding of language translation and run time environment;
3) design and implement language constructs using syntax/semantic notations;
4) write programs in various programming paradigms.

Assignments:
There will be frequent problem solving and programming assignments.
All work must be done individually. Violating this will result in an assignment grade of zero and possible academic dishonesty penalties. Problem solving assignments are due at the beginning of the class, and no late assignments are acceptable. Programming assignments are due as directed by the instructor, and there will be 20% off per day on late submissions. Programs should be readable with good documentation.

Evaluation and Grading Policy:
    Midterm 1   25%, date will be announced in advance
    Midterm 2   25%, data will be announced in advance
    Final exam   30%, Dec. 16th (W), 3:30pm – 5:30pm
    Assignments 20%
Note: no make-up exams, except emergency cases verified with official documents.

Participation:
Attending classes/labs is very important. It is not guaranteed that a student can succeed in this course without attending classes regularly.

University Policies:

Students with Disabilities
Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities in the Henry Madden Library, Room 1202 (278-2811).

Honor Code
 "Members of the CSU Fresno academic community adhere to principles of academic integrity and mutual respect while engaged in university work and related activities." You should:
    a) understand or seek clarification about expectations for academic integrity in this course (including no cheating, plagiarism and inappropriate collaboration)
    b) neither give nor receive unauthorized aid on examinations or other course work that is used by the instructor as the basis of grading.
    c) take responsibility to monitor academic dishonesty in any form and to report it to the instructor or other appropriate official for action.

Instructors may require students to sign a statement at the end of all exams and assignments that "I have done my own work and have neither given nor received unauthorized assistance on this work." If you are going to use this statement, include it here.

Cheating and Plagiarism
 "Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one's grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term 'cheating' not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating which consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (i.e., their intellectual property) so used as one's own work." Penalties for cheating and plagiarism range from a 0 or F on a particular assignment, through an F for the course, to expulsion from the university. For more information on the University's policy regarding cheating and plagiarism, refer to the Class Schedule (Legal Notices on Cheating and Plagiarism) or the University Catalog (Policies and Regulations).

Computers
"At California State University, Fresno, computers and communications links to remote resources are recognized as being integral to the education and research experience. Every student is required to have his/her own computer or have other personal access to a workstation (including a modem and a printer) with all the recommended software. The minimum and recommended standards for the workstations and software, which may vary by academic major, are updated periodically and are available from Information Technology Services
(http://www.csufresno.edu/ITS/) or the University Bookstore. In the curriculum and class

assignments, students are presumed to have 24-hour access to a computer workstation and the necessary communication links to the University's information resources."

Disruptive Classroom Behavior
"The classroom is a special environment in which students and faculty come together to promote learning and growth. It is essential to this learning environment that respect for the rights of others seeking to learn, respect for the professionalism of the instructor, and the general goals of academic freedom are maintained. ... Differences of viewpoint or concerns should be expressed in terms which are supportive of the learning process, creating an environment in which students and faculty may learn to reason with clarity and compassion, to share of themselves without losing their identities, and to develop and understanding of the community in which they live . . . Student conduct which disrupts the learning process shall not be tolerated and may lead to disciplinary action and/or removal from class."

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Tentative course schedule (subject to change with prior notice)

Class	Date	Topic	Textbook reading
week1	8/26	Introduction – paradigms/implementation schemes	Ch1
week2	8/31, 9/2	Syntax – CFG, expression notations	Ch3
week3	9/9	Syntax – CFG more, parse tree/derivation, ambiguity	Ch3
week4	9/14, 16	Semantics – semantic domain, attribute grammar	Ch3
week5	9/21, 23	Semantics – operational/axiomatic/denotational	Ch3
week6	9/28, 30	Type checking, binding and scope rules	Ch5, Ch6
week7	10/5, 7	Type systems – structured types, pointer/reference types	Ch6
week8	10/12, 14	Run time memory management - garbage collection	Ch6
week9	10/19, 21	Imperative programming – features and constructs	Ch7, Ch8
week10	10/26, 28	Subprograms – parameter passing methods/implementations	Ch9
week11	11/2, 4	Subprograms – activation records and run time stack	Ch10
week12	11/9	Data encapsulation, Object-oriented programming	Ch11, Ch12
week13	11/16, 18	Concurrent programming	Ch13
week14	11/23	Exception handling	Ch14
week15	11/30, 12/2	Functional programming	Ch15
week16	12/7, 9	Logic programing, and final review	Ch16