Texas Tech University
Department of Computer Science

Course Name: Concepts of Programming Languages
Number: CS3361 **Semester:** Spring 2020
Website: TTU BlackBoard
Instructor: Dr. Yuanlin Zhang **Office:** EC313 **Email:** y.zhang@ttu.edu
Office hours: 11:00-12:20 (Tue, Thur) or by appointment

TA: TBD **Office:** TBD **Email:** TBD
Office hours: TBD

Class room: PE110 **Class Hours:** 8:00am-9:20am (Tue, Thur)
Lab: No Lab.

Text: *Programming Language Pragmatics (4th Edition) by M. Scott, Published by Morgan Kaufmann, 2016.*

Catalogue Listing: Study of programming language design. The investigation and comparison of different programming language paradigms.

Course objectives: This course will cover fundamental concepts of the majority of the thousands of programming languages: techniques for syntax and semantic analysis of programming languages and the major constructs and concepts of procedure, functional and logic languages. It aims to provide not only a unified view of (many) programming languages, but also the foundation which makes it easier for students to grasp/evaluate new languages and enables better programming (modeling) skills.

Key Topics:

1. Brief introduction of the programming languages
2. Formal syntax
   a. Regular expression and tokens
   b. Context free grammar and parsing
3. Semantics
4. Procedural paradigm
5. Logic programming paradigm
6. Functional programming paradigm

Course Prerequisites: CS2413 (Data Structures).

Expected prior knowledge and skills in: basic problem-solving methodology and ability to develop a solution for a problem using pseudo-code and to program in some high-level language (including control flow and functions).

Learning Outcomes & Assessment Methods: Students who have completed this course should have the ability to:

Objective	ABET Outcomes	Assessment Methods
1. Be capable of specifying the simplified syntax of programming languages	a	Homework, midterm and/or final exams.
2. Comprehend the formal semantics of simplified programming languages	a	Homework, midterm and/or final exams.
3. Know how to construct the simplified tokenizer and parser	a, j	Homework, Projects
4. Comprehend and apply the program paradigms to simple problems	a, h	Homework, programming assignment, exams

Course Schedule:

The list (below) provides a tentative schedule which may be adjusted in terms of the overall progress of the class. All changes will be announced in class or on the course website.

01/16 Introduction to programming languages
01/20 Compilation and interpretation
01/23 Syntax (regular expression -1)
01/28 Syntax (regular expression - 2)
01/30 Practice - 1
02/04 Syntax (Context free grammar - 1)
02/06 Syntax (Context free grammar / parsing)
02/11 Syntax (Parsing)
02/18 Practice - 2
02/20 Semantic analysis
02/25 Semantics (attributed grammar)
02/27 Semantics (evaluation of attributes)
03/03 Practice - 3
03/05 Semantics (issues in the evaluation - 1)
03/10 Semantics (issues in the evaluation - 2) / review
03/12 Midterm
03/24 Procedural language constructs - Names
03/26 Procedural language constructs - Types
03/31 Procedural language constructs - control
04/02 Practice - 4
04/07 Procedural language constructs - abstraction (function)
04/09 Procedural language constructs - abstraction (function)
04/14 Functional Programming
04/16 Practice - 5
04/21 Functional Programming
04/23 Logic Programming
04/28 Logic Programming
04/30 Holiday
05/05 Practice / Review / Summary

Grading Policy:

- Homework (15%), class participation 10%, programming assignments (20%), midterm (25%), and final exam (30%).
- No submission will be accepted after the due date.
- The usual grading scale will be used: A (90-100), B (80-89), C (70-79), D (60-69), F (0-59).

Ethical Conduct:

- The rules governing academic conduct and Honesty by TTU (http://www.depts.ttu.edu/opmanual/OP34.12.pdf) and College of Engineering should be strictly obeyed.
- Zero tolerance to plagiarism – once caught in any assignment (from a single homework to a project), all involved will get an F for this class and be reported to the university.
- Everything you do for credit in this subject is supposed to be your own work. Whenever you have doubts about the problems in homework and assignment, discussions with other students and the instructor are encouraged. However you need to write the solution yourself and list the contributions from other people.

Student with Disabilities:

Any student who, because of a disability, may require special arrangements in order to meet course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note that instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services Office in 335 West Hall or 806-742-2405.