CS 4303 Programming Language Concepts

Department of Computer Science and Engineering Technology

Course Prefix, Number and Title: CS 4303 Programming Language Concepts
Credits/Lecture/Lab Hours: 3 credit hours
Year/Semester/Class Number: Summer II 2025, CRN: 15527

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Office Hours:
Day(s)/Time(s): Tuesday & Thursday 1:00pm-2:30pm
Also, by appointment
Location: S-717

Course Description
The Object of this course is to provide a foundation in the concepts and implementation of modern programming languages. We will also cover imperative, functional, logic, and object-oriented programming paradigms. Programming assignments and/or closed labs will be conducted for syntax and semantics analysis and different paradigms.

Prerequisite(s)
CS 2301 and CS 3304

Course Learning Outcomes
By successfully completing this course, students will be able to:

Course Learning Outcome	Program Learning Outcome
1. Determine the paradigms of a programming language and find out the abstractions used in that language; become familiar with the history of programming languages and their major design principles.	Demonstrate an understanding of various aspects of computing environments, including hardware organizations, programming languages and paradigms, operating systems, and other computing tools.
2. Define language structures using regular expressions, context-free grammars, parse trees, abstract syntax trees, and syntax diagrams; implement parsers using recursive descent parsing techniques.	Master the fundamental concepts of computer programming, including data models and abstraction, control structures, symbolic logic, algorithmic thinking and testing and debugging with various computing environments
3. Perform basic semantic analysis, including binding and scoping using symbol tables and box-and-circle diagrams.	Same as 2.
4. Define abstract data types using algebraic specifications and implement abstract data types using classes; apply object-oriented programming principles – inheritance and dynamic binding, in writing Java/C++ programs.	Same as 2.

5. Write basic Lambda Calculus expressions and do basic conversions; write functional programs in Lisp, particularly, recursive functions.	Same as 2.
6. Use first-order logic in composing Prolog programs and describe how Prolog clauses are executed.	Same as 2.

The program's PLOs can be found at Bachelor of Science in Computer Science (uhd.edu)

Required Materials

Kenneth C. Louden & Kenneth A. Lambert, Programming Languages Principles and Practice, 3rd Edition, Cengage Learning 2012, ISBN-13: 978-1-111-52941-3, ISBN-10: 1-111-52941-8.

Recommended Materials

Students are encouraged to read materials about the topics that are helpful in their study, e.g., resources about functional, logic, and object-oriented programming languages should be helpful in learning programming in corresponding paradigms.

Note: A student of this institution is not under any obligation to purchase a textbook from a university-affiliated bookstore. The same textbook may also be purchased from an independent retailer, including an online retailer. A digital copy of the textbook may be available on the UHD library website.

Evaluation Criteria

Course grades will be determined as the weighted point average (WPA) of the following items:

Item Number	Item Description	Weight
1	2 Tests (20% each)	40%
2	Final Exam	30%
3	Labs and Programming Assignments	30%

Letter grades will be assigned per UHD's Policy.

90 =< WPA → A, 80 =< WPA < 90 → B, 70 =< WPA < 80 → C, 60 =< WPA < 70 → D, WPA < 60 → F

Note: While I will post your assignment grades in Canvas, final grades will be calculated solely on the basis of the weighting and values described on the syllabus. Final grades or point totals in Canvas may not be accurate and should not be taken as the official grade source unless confirmed by the instructor.

Course Policies

- **Methods of Communication with the Instructor**

Several communication methods will be used:

1. Email:
   a) The Canvas email will be the official UHD email communication system for this class. If you have an immediate/urgent question, please email me at my UHD email which is: linh@uhd.edu
   b) I will be checking both my UHD email accounts and will respond to your questions in less than 48 hours (excluding weekends and holidays).
2. Class Announcements:
   a) I will be using the Announcements feature in Canvas to communicate information to the entire class. Please check your Canvas email and Class Announcements, frequently.
3. Phone:
   a) You can call me or leave a voice message at 713-221-2781

- **Online Course Support**:
  I will use the Canvas LMS (https://canvas.uhd.edu/) to provide you with online course material. As the semester progresses, various materials will be posted there, including lecture notes, labs, and course announcements.
- **Average Workload:** 6-10 hours/week, in addition to class time.
- **Grading and Course Evaluation**
  - **Late Work:** All coursework, including closed labs, must be submitted by the deadline. No late submissions will be accepted.

- **Make-Up Exams:** Make-up exams will *only* be given in cases of documented emergencies. It is your responsibility to contact your instructor with documentation of your emergency at least 3 days before the exam date.

- **Class Attendance & Tardiness (if applicable)**
  Student attendance in the synchronous class meetings is expected. It is strongly recommended that the students attend closed lab sessions. Attendance in exams is mandatory.

- **Lab Safety Rules (if applicable)**
  N/A.

- **Course hardware and Software Requirements (if applicable)**
  During the course, students will be required to do programming assignments using Lisp, Prolog, C++, and Java. Lisp and Prolog programming will be done using free IDE such as Racket software (Racket (racket-lang.org)) and SWI Prolog (http://www.swi-prolog.org/). C++ and Java programming can be done using any IDE of your choice. Make sure that your computers have those software installed.

- **Other**
  N/A.

UHD Common Course Syllabus Policies

https://www.uhd.edu/academics/syllabus.aspx

In addition to the policies specified in this course syllabus, all UHD courses also follow shared policies published on our syllabus website addressing the following areas:

- *Responses to University-Wide Disruptions*
- *Academic Honesty*
- *Accessibility and Statement of Reasonable Accommodations*
- *Attendance and Roster Certification*
- *Book Purchasing*
- *Recording of Class Sessions*
- *Religious Holy Days*
- *Safety Precautions*
- *Student Support Services*
- *Student Counseling Services*
- *Technology Requirements*
- *Testing and Final Exams*
- *Use of Blackboard, Canvas, Gatormail, and Zoom*

Course Outline and Tentative Schedule

Note: This is a tentative schedule, and any changes will be timely communicated to the class and posted in Canvas.

Week	Monday (Virtual)	Tuesday (In person)	Wednesday (Virtual)	Thursday (In person)
1	7/7 Chapter 1	7/8 Chapter 2 & 3	7/9 Chapter 3	7/10 Chapter 3 Lisp Lab
2	7/14 Chapter 3	7/15 Chapter 4 **Midterm Exam 1**	7/16 Chapter 4	7/17 FPGA programming Chapter 4 Prolog Lab
3	7/21 Chapter 4	7/22 Chapter 5	7/23 Chapter 5	7/24 Chapter 5 Dynamic Binding Lab

4	7/28 Chapter 6	7/29 **Midterm Exam 2** Chapter 6	7/30 Chapter 6	7/31 Chapter 6 Scanner Lab
5	8/4 Chapter 7	8/5 Chapter 7 Parser Lab	8/6 Chapter 7	8/7 **Final Exam (onsite)**

PREPARED BY
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