California State University, Los Angeles  
College of Engineering, Computer Science, and Technology  
Computer Science 3035:  
Programming Language Paradigms  
Fall 2019

COURSE INFORMATION

Instructor Information
Instructor: John Hurley
Office Location: E&T A310

Email: jhurley2@calstatela.edu  
Office Hours: Check web page: http://www.calstatela.edu/faculty/john-hurley
Class Days/Time: MW 2:00 PM – 4:05 PM
Classroom: E&T A220
Prerequisites: Hard Prerequisite: CS 2013

Course Description
Description of programming language principles; principles concerning variables, data types, subprograms, compilation/interpretation of languages. Introduction to functional programming as a programming paradigm in one or more languages. Lecture 2 hours, laboratory 3 hours. Graded ABC/NC.

Course Objectives/Outcomes

The Student Learning Outcomes that are addressed by the course are:

SLO #1. Students will be able to apply concepts and techniques from computing and mathematics to both theoretical and practical problems.

SLO #2. Students will be able to demonstrate fluency in at least one programming language and acquaintance with at least three more.

SLO #3. Students will have a strong foundation in the design, analysis, and application of many types of algorithms.

SLO #5. Students will have the training to analyze problems and identify and define the computing requirements appropriate to their solutions.

SLO #6. Students will have the training to design, implement, and evaluate large software systems working both individually and collaboratively.

Other outcomes of instruction: At the end of the course, students will be able to

- Describe the concepts and design issues involving language compilation and interpretation.
- Describe the concepts and design issues involving variables, the different attributes of variables.
- Describe the concepts and design issues involving data types for different languages.
- Describe the process of defining and running subprograms.
- Describe concepts and design issues involving the formal and actual parameters of subprograms.
- Describe basic operation of a call stack.
- Describe the distinguishing features of functional programming languages.
- Be able to create programs using one or more functional programming languages.
- Be able to use functions as parameters and return types, to use higher-order functions such as map, fold, etc., lambda functions.
- Understand immutability in functional languages.
- Understand partial functions and currying.
- Understand how side-effects are created and the dangers they present.
REQUIRED COURSE MATERIALS

Textbooks

Title: Concepts of Programming Languages (Optional)
Author: Robert W. Sebesta
Edition (IMPORTANT!): 12th
ISBN 13: 9780134997186
ISBN 10: 0134997182

Title: Learn You A Haskell for Great Good
Author: Miran Lipovača
This is a free, online book: http://learnyouahaskell.com/

Software Requirements: (see links on CSNS)
Haskell GHCI
Python 3

COURSE POLICIES

Course Structure
Course meetings include 100 minutes per week of lecture and 140 minutes per week of lab time. You may complete in-class work using lab computers, but you will need access to a reasonably powerful computer for homework assignments.

Computer Requirements
You may complete in-class work using lab computers, but you will need access to a reasonably powerful computer for homework assignments.

ASSIGNMENTS AND GRADING POLICY

Late Work
I do not accept late work except for cases of documented emergencies

All work must be submitted through CSNS. **Do not email me your assignments!**

**Grading Criteria**

**Grade Allocation**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Lab Exercises</td>
<td>20%</td>
</tr>
<tr>
<td>Homework Assignments</td>
<td>40%</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**Grading Scale**

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100%</td>
</tr>
<tr>
<td>A-</td>
<td>90-93%</td>
</tr>
<tr>
<td>B+</td>
<td>86-90%</td>
</tr>
<tr>
<td>B</td>
<td>Lowest passing grade for grad students 80-86%</td>
</tr>
<tr>
<td>B-</td>
<td>76-80%</td>
</tr>
<tr>
<td>C+</td>
<td>73-76%</td>
</tr>
<tr>
<td>C</td>
<td>Lowest passing grade for undergrads 70-73%</td>
</tr>
<tr>
<td>NC</td>
<td>Below 80% (graduate students)</td>
</tr>
<tr>
<td></td>
<td>Below 70% (undergraduates)</td>
</tr>
</tbody>
</table>

**Grades**

You should be able to calculate your current grade at any time using the grading allocations listed above. This calculation is tedious, but not difficult. Please do not ask the instructor to do this for you.

**Course Communication**

**Questions**

Questions about the course material and assignment requirements should be asked in class or posted on the course forum on CSNS. Individual questions about grades you have received or other questions relevant only to you should be asked by email or in the instructor's office hours.
Netiquette
When posting on the discussion forum it is important to understand how to interact with one another online, netiquette. You can read more about the rules of netiquette at 15 Rules of Netiquette for Online Discussion Boards

HELPFUL STUDENT RESOURCES

Technical Resources
Information on CSULA technical support resources for students: Technical Support

Student Support Services
Information on CSULA student support resources for students: Student Services

Academic Support Services
Information on CSULA academic support resources for students: Academic Support

Moodle Mentor Site
Information for students on how to be a successful online student and how to use Moodle: Moodle Mentor (Moodle Tutorials)

Canvas Student Support
Information for students on how to be a successful online student and how to use Canvas: Canvas Community Guides for Students | Canvas Student Tour Course
COURSE & UNIVERSITY POLICIES

Student Handbook
Information on student rights and responsibilities, academic honesty, standards of conduct, etc., can be found in Schedule of Classes for the current quarter visit the Cal State LA Schedule of Classes Information under Policies and Procedures.

Dropping and Adding
Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. Students should be aware of the current deadlines and penalties for adding and dropping classes by visiting the GET home page. (Registrar news and information)

Americans with Disabilities Act (ADA)
Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation. For more information visit the Office for Students with Disabilities home page.

Academic Honesty/Student Conduct
The work you turn in must be your own. Penalties for cheating range from receiving a 0 on an assignment to expulsion from the university, with the typical penalty being a score of -100% of the points on the assignment.

COURSE OUTLINE/SCHEDULE OF ASSIGNMENTS

<table>
<thead>
<tr>
<th>Wk</th>
<th>Topics</th>
<th>Reading</th>
<th>Lecture Slides</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Programming Language Concepts</td>
<td>Sebesta Ch 1</td>
<td>Lecture 1</td>
<td>Quiz 1</td>
</tr>
<tr>
<td>2</td>
<td>Variables</td>
<td>Sebesta Ch 5</td>
<td>Lecture 2</td>
<td>Quiz 2</td>
</tr>
<tr>
<td>3</td>
<td>Types</td>
<td>Sebesta Ch 6</td>
<td>Lecture 3</td>
<td>Quiz 3</td>
</tr>
<tr>
<td>4</td>
<td>Subprograms I</td>
<td>Sebesta Ch 9</td>
<td>Lecture 4</td>
<td>Quiz 4</td>
</tr>
<tr>
<td>5</td>
<td>Subprograms II</td>
<td>Sebesta Ch 10</td>
<td>Lecture 5</td>
<td>Quiz 5</td>
</tr>
<tr>
<td>6</td>
<td>Haskell: Intro, lists</td>
<td>LYAH Ch 1,2</td>
<td>Haskell Lec 1</td>
<td>Midterm on weeks 1-5, Lab</td>
</tr>
<tr>
<td>7</td>
<td>Haskell: Types and type classes</td>
<td>LYAH Ch 3</td>
<td>Haskell Lec 2</td>
<td>Lab 2</td>
</tr>
<tr>
<td>8</td>
<td>Haskell: Pattern Matching, Guards, Case of, etc.</td>
<td>LYAH Ch 4</td>
<td>Haskell Lec 3</td>
<td>Lab 3, Homework 1</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>-----</td>
<td>------</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>LYAH Ch 5</td>
<td>LYAH Ch 6</td>
<td>LYAH Ch 8</td>
<td>LYAH Ch 9</td>
<td>??</td>
</tr>
<tr>
<td>Haskell Lec 4</td>
<td>Haskell Lec 5</td>
<td>Haskell Lec 6</td>
<td>Haskell Lec 7</td>
<td>Lab 4</td>
</tr>
<tr>
<td>Lab 4</td>
<td>Lab 8</td>
<td>Lab 8</td>
<td>Lab 9</td>
<td>Lab 10, Homework 4</td>
</tr>
</tbody>
</table>