

CSCI 6220: Topics in Language Design Spring 2015

Class Meeting	Tuesday and Thursday, 11am – 12:15pm Science & Technology Building, Room 144 (Global Classroom) NOTE: We will be relocating at some point during the semester.
Instructor	Dr. Mark Hills
Office	Science & Technology Building, C-110
Office Hours	Tuesday 10:00am – 11:00am Wednesday 1:00pm – 3:00pm Wednesday evening 9:00pm – 10:00pm Thursday 10:00am – 11:00am
Phone	252-328-9692
Email	hillsma@ecu.edu (response within 24 hours during the week, possibly longer on weekends)
Course web page	http://blackboard.ecu.edu

Course Summary

The catalog description for this course is as follows:

Semantics and implementation characteristics of languages supporting modern computing paradigms such as functional programming, logic programming, constraint programming, and object-oriented programming.

The course teaches about the definition of programming languages using K, an executable framework for programming language semantics. During the course we will look at a variety of language styles (e.g., functional, object-oriented, logic) and discuss various semantic formalisms (e.g., big-step, small-step, and modular structural operational semantics, denotational semantics).

Prerequisites

The only prerequisite for this course is CSCI 3675 or consent of instructor. The expectation is that you are comfortable with basic concepts in programming languages. CSCI 3675 is what is typically called a “programming languages survey” course, discussing a number of different programming languages, language types, and language features. We will be exploring individual features in depth as the course progresses.

Learning Outcomes

After taking this course, you should be able to:

- effectively work with (read and write) different styles of programming language semantics;
- define the semantics of new or existing programming languages and language features;
- reason about how programming languages and language interpreters work.

Textbooks

There are no required texts for this course – we will cover everything in class, and online tutorials and guides are available for K.

The recommended text for the course is *Semantics with Applications: An Appetizer*, by Hanna Riis Nielson and Flemming Nielson. This book does a good job describing operational and denotational semantics at an introductory level. You can buy it online at Amazon, here: <http://www.amazon.com/Semantics-Applications-Appetizer-Undergraduate-Computer/dp/1846286913/>. You should also be able to buy it at the campus bookstore.

An optional text for the course is *Formal Semantics of Programming Languages* by Glynn Winskel. This book is a much deeper introduction to the topic, but is not a good introductory book – it's much better to read once you have a basic understanding of the area. There are also a number of errors, so you should download the online errata sheet for the book (talk to me if you decide to purchase it). All that said, it is a very good book, covering a lot of material in depth. You can buy it online at Amazon here: <http://www.amazon.com/Formal-Semantics-Programming-Languages-Winskel/dp/0262731037/>. It may also be possible to buy it at the campus bookstore (they can definitely order it for you, but most likely don't have it on hand).

Exams

The final exam for the course will be a take-home exam. It will be issued on the last day of class (Tuesday, April 28) and will be due by the end of day on the following Monday, May 4th. There will not be a midterm exam.

Grading

Students will be evaluated based on a combination of homework, an individual course project, and the final exam. The following grade cut-offs, using a 100 point scale, will be used:

Grading	
A	≥ 90
B	≥ 80
C	≥ 70
F	< 70

This grade is based on the following relative weights of the various activities:

Weighting	
Homework	40%
Individual Project	40%
Final Exam	20%

Homeworks will be due roughly every two weeks. The project will be due at the end of the course, with project presentations during our scheduled final exam period: 11am – 1:30pm on Thursday, May 7.

Student conduct

Smoking is not permitted in classrooms. Please turn off telephones while in class. Laptops and tablets can be used for taking notes, but should not be used for other work (or recreational browsing, playing games, etc).

Students are expected to abide by the university's Student Honor Code. The homework that you do is a critical part of your education. Each student is expected to do his or her own work, except where teamwork is explicitly allowed or required. That does not mean you are not allowed to discuss your ideas with other students. Working in groups can be beneficial, and I encourage you to talk through ideas with other students. But outright copying is plagiarism and is unacceptable. Students who copy other students' work, or who allow their work to be copied, or who copy their work from other sources, such as the internet, are violating the ECU academic integrity policy.

Other potential academic integrity violations are cheating, falsification, multiple submissions of the same work in different classes, and attempts at any of these violations. Please see http://www.ecu.edu/cs-studentlife/policyhub/academic_integrity.cfm for more details.

Academic integrity violations can result in a grade penalty up to and including an F for the course.

Other Policies

No incompletes will be issued in this course except for extraordinary circumstances, and even then only if you are nearly done already, and have done work of acceptable quality, so that you have a realistic chance to pass the course.

All homework solutions and project deliverables are due by the posted due date. If for some reason you are not able to complete the assignment on time, you must contact me directly with an explanation and request an extension. If something comes up and you are having trouble keeping up with the class, talk to me right away, ***don't wait until the end of the semester!***

Course participation is an important part of the course. If you do not participate you will make it harder to have the kinds of discussions we need to make the class interesting. Please read any assigned readings in a timely fashion, due the homework promptly (so you know if you are going to get stuck!), and come to class prepared to talk.

Success in the class is directly correlated with class attendance, so I highly recommend that you attend and actively participate. If for some reason you cannot attend, please let me know – my expectation is that you will watch the lecture online and ask me questions about the material if you have any. For online students, I recommend that you watch the lecture the day it is given and send any questions before the next class session (so I can address them in class). Falling behind will make the course more difficult than it would otherwise be. I will be taking attendance at regular points in the class for my own records.

To encourage use of the discussion groups on Blackboard, I will not answer any questions about the course material using either email or Skype. These questions ***must*** be posted in the discussion groups. You are welcome to contact me directly with questions about grading or other personal class-related items, or to discuss the material with me more fully if I agree to take it “offline” from the discussion groups. I will answer questions about the syllabus, but will not answer questions where the answer is already clearly given in the syllabus.

Weather emergencies

In the event of a weather emergency, information about ECU can be obtained through the following sources:

ECU emergency notices

<http://www.ecu.edu/alert>

ECU emergency information hotline 252-328-0062

Students with disabilities

East Carolina University seeks to comply fully with the Americans with Disabilities Act (ADA). Students requesting accommodations based on a disability must be registered with the Department for Disability Support Services located in Slay 138 ((252) 737-1016 (Voice/TTY)).

For more information, please see <http://www.ecu.edu/cs-studentlife/dss/>.

Retention Requirements

Academic requirements for retention have changed. Please be aware of the following new GPA requirements. Please discuss the retention requirements, entrance to major requirements, and your goals with your academic advisor.

GPA Hours at ECU (identified in Transcript in Banner Self Service) plus transferred credit hours	"Old" Retention Requirement All courses taken at ECU	New Retention Requirements Effective with Fall 2011 grades All courses taken at ECU
1-29 semester hours	1.6 GPA	1.8
30-59 semester hours	1.8 GPA	1.9
60-74 semester hours	1.9 GPA	2.0
75 or more semester hours	2.0 GPA	2.0

Caveats

Occasionally, it may be necessary to revise this syllabus due to extenuating circumstances. I reserve the right to revise this syllabus if the need arises. If I do so, I will provide you with advance notice.