

CS 596 Functional Programming and Design
Fall Semester, 2014 Syllabus
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CS 596 Functional Programming & Design Fall 2014

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Office Hours 3:15-5:15 pm Tuesday, Thursday
10 am to Noon Friday

Course WWW Site: <http://www.eli.sdsu.edu/courses/fall14/cs596/index.html>
All course handouts will be delivered via WWW at the above URL.

Texts: **Clojure Programming** by Chas Emerick, Brian Carper and Christophe Grand
Functional Thinking: Paradigm Over Syntax by Neal Ford

Useful Resource: **Clojure Cookbook** by VanderHart & Neufeld

Safari Books Online: The three books listed above can be accessed on-line using your Red ID and SDSU library password at: <http://proquest.safaribooksonline.com.libproxy.sdsu.edu>

Prerequisites: CS310 (Data Structures), CS320 (Programming Languages)

Grading: All programs will be done in Clojure, which will be covered in the course. Your grade in this course will be determined as follows:

Homework, Programs	2/3
Exam (1) Oct 23	1/3

Crash Policy: As seats open up in the class they will be filled by seniority. Two undergraduate students will be admitted for each graduate student. In order to determine seniority students must provide unofficial transcripts. Each class period all open seats will be filled. To be considered I must have unofficial transcripts at least 2 hours before class.

Goals of the Course:

Understand the common features of functional programming
Know how to use features of functional programming
Become comfortable using functional programming
Be able to build well designed functional programs

Late Policy: Late homework will be accepted, but with a penalty. An assignment turned in 1-7 days late, will lose 3% of the total value of the assignment per day late. The eighth day late the penalty will be 40% of the assignment, the ninth day late the penalty will be 60%, after the ninth day late the penalty will be 80%. Once a solution to an assignment has been posted or discussed in class, the assignment will no longer be accepted. Late penalties are always rounded up to the next integer value.

Email & Assignments: Unless indicated by the assignment all assignments are to be submitted to the course repository. No assignments will be accepted via email.

No Extra Credit: There will not be any extra credit assignments. There will not be any extra credit problems in the assignments.

Cheating: Any one caught cheating will receive an F in the course.

Disabled Students: If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that accommodations based upon disability cannot be provided until you have presented your instructor with an accommodation letter from Student Disability Services. Your cooperation is appreciated.

Course Outline:

Introduction Imperative versus Functional programming

Clojure & Functional Basics

Scalar Data Types, Composite types, Lazy evaluation

Functional forms, recursion

Lambdas, Closures, Macros

Namespaces, Multi-methods

Lazy evaluation, Immutability

Pure functions, first-class functions

Currying, memorization, high order functions

List compressions, restructuring

Collection pipelines

Testing, Clojure - Java interoperation

Concurrency & Mutation

Software Transactional memory

Vars, Refs, Agents, Atoms, promises, futures

Functional programming, Web Apps, Databases

Functional programming patterns and practices