Course Syllabus

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CMPR.X418 - Go Programming, Fundamentals - 3.0 units

Instructor: Suleman Saya, B.S.

Course Description

Go language (golang), often considered the "C for the 21st century", is an open source programming language developed by Google to help build simple and advanced-level software systems. The core strength of **Go** is its concurrency mechanisms that make it simpler to write reliable software and to exploit multi-core architectures. **Go** is a **C-like** compiled language that offers portability, speed, and modularity, as well as compatibility with C language. The **Go** compiler can produce an executable binary for many different hardware architectures without rewriting the application source code and has a **built-in garbage** collection mechanism. Participants in this class learn to write faster and modular code, for real-world, cloud-based and general purpose applications. Assignments and exercises accompany lectures.

Prerequisite Skills

Students should have C programming skills. Advanced C is recommended.

Notes

Students must have access to a GO compiler.

Learning Outcomes

At the conclusion of the course, you should be able to:

- Write faster and modular code, for real-world, cloud-based and general purpose applications.
- Understand and use the basic programming constructs of GO language.
- Manipulate various GO language data types, such as arrays, strings, and pointers.
- Write GO language code using principles of concurrency programming.
- Understand how to wirte web servers for cloud-based applications.
- Manage memory apropriately, including proper allocation/deallocation procedures.

Course Outline

Here’s an outline of what I plan to cover in class. But, it may be changed to meet your class’s needs.

[Week/Module]	Topics	Assignments

1	History of Go Language Setting up golang compiler Introduction to golang and its program structure The iota and enumerated values. Control Flow The switch statement	
2	Golang control structures, arrays, slices, pointers, and functions	Assignment #1 Convert C source code into golang
3	Slices in Golang, Variable scopes and shadowing, range, variadic functions, maps, and user defined data structures	Assignment #2 Using structure, write a program to read employee data.
4	Anonymous and promoted struct fields, exported/unexported identifiers in golang, method vs functions, receivers, and interface.	
5	Interfaces in golang Memory allocation with make vs new, data structures using (link list, stack, tree), file I/O and util package	Assignment #3 Simulates the operation of a parking lot by using a stack data structure.
6	Using standard package and Creating custom packages init Function Error Handling	

	Panic and Recover Reflection	
7	POSIX thread (pthread) libraries, Goroutines , Channels in Go Language, Channels Usage	Assignment #4 Write a program using link list to read a data from the text file.
8	Golnag web foundation, HTTP protocol, Populare web Frameworks, Building web server, Using templates, Templates control structures, JSON and golang	
9	Big O Notation Complexity Categorizing Time Complexity into Classes Constant time O(1), Linear complexit O(n), Quadratic complexity O(n^2), logarithmic complexity O(log n)	Assignment #5 Write a program to demonstrate the understand of the race condition of goroutines.
10	Testing Package in golang Table Driven Testing Checking Test Coverage Cross-Compilation Useful golang tools	

	Debug golang application with LLDB	

Required Tools and Materials

- None

Recommended Tools and Materials

- The Go Programming Language

  By Alan A. A. Donovan and Brian W. Kernighan

  Press: Addison-Wesley, ISBN-13: 978-0-13-419044-0

Performance Evaluation

Activity	Percentage	Description
5 Assignments	40%	
Quiz #1	30 %	Covers lecture #1 to lectures #4
Quiz #2	30 %	Covers lecture #5 to lecture #10
Total:	100 %	
Total:	**100%**	

Grading

Letter grades (A through F) are the default options. However, students have until the day before the course end date to change their grading preference to a Credit/No Credit Option.

Grading scale

Grade options	%
A	>93
A-	90-92
B+	88-89

B	83-87
B-	80-82
C+	78-79
C	73-77
C-	70-72
D+	68-69
D	63-67
D-	60-62
F	59 and below
Credit	60 and above
No Credit	59 and below

***For alternative grading options, students MUST contact extensiongrades@ucsc.edu (mailto:extensiongrades@ucsc.edu) with the Alternative Grade Form.**

Click Here to Review the Grading and Credits Website (https://www.ucsc-extension.edu/info/policies/grading-and-credits-policy/)

UCSC Extension Policies:

Click here to view and print the **UCSC Extension Policies (PDF) (https://file.ucsc-extension.edu/unexfiles/UNEX_Policies_Syllabus.pdf)**

Course Summary:

Date	Details	
Thu Feb 4, 2021	assignment1 (https://classroom.ucsc-extension.edu/courses/5087/assignments/41856)	due by 11:59pm
Thu Feb 11, 2021	assignment2 (https://classroom.ucsc-extension.edu/courses/5087/assignments/41857)	due by 11:59pm
	Complete Course Evaluation (https://classroom.ucsc-extension.edu/calendar?event_id=14756&include_contexts=course_5087)	
	Complete Course Evaluation (https://classroom.ucsc-extension.edu/calendar?event_id=14757&include_contexts=course_5087)	

Date	Details
	Complete Course Evaluation (https://classroom.ucsc-extension.edu/calendar?event_id=14758&include_contexts=course_5087)
	Complete Course Evaluation (https://classroom.ucsc-extension.edu/calendar?event_id=14759&include_contexts=course_5087)
	Complete Course Evaluation (https://classroom.ucsc-extension.edu/calendar?event_id=14760&include_contexts=course_5087)