

SG400 Compiler and Interpreter Design

Instructor	Course Dates
<i>Tom Sinclair</i>	<i>10/10/2006 – 12/14/2006</i>

Classroom Hours	Office Hours
<i>MT 10A – 1:50P, H 2P – 5:50P</i>	<i>W Noon to 4P</i>

Course Description

This class introduces students to the construction of compilers and interpreters. During this course students will build either an interpreter or a compiler from scratch for either a custom designed language or a language such as Pascal or Assembly. Upon completion of this course, students should be able to build a compiler or interpreter from scratch using a language such as C++.

Course Outcomes

The course outcomes are the goals of instruction. These outcomes identify the knowledge, skills, and attitudes a student should have upon completing this course.

Upon completion of this course, students should be able to:

Knowledge

1. Distinguish between a compiler and interpreter and how computers execute the programs differently.
2. Explain how compilers and interpreters convert a high-level programming language to the machine language that a computer is able to execute.
3. Evaluate the role of compilers and interpreters in the development of a game product.

Skills

1. Design a theoretical compiler or interpreter on paper prior to any code implementation.
2. Translate a regular expression into the corresponding automaton that will be the basis for the interpreter written for that expression.
3. Create an interpreter for a defined high-level language that will execute on a computer.

Attitudes

1. Appreciate the challenges of designing compilers and interpreters for full programming languages and scripting languages.

Course Prerequisites

SG220, SG310, SG360

Class Breakdown

Lecture Hours:	72
Lab Hours:	36

Total Hours: 108

Credit Hours

CO/IL = 9.0 Credit Hours

CA/VA = 8.5 Credit Hours

Course Texts

Writing Compilers and Interpreters, 2nd Edition, Ronald Mak, Wiley, 1996, ISBN: 0-471-11353-0

Teaching Strategies

The teaching strategies for this course include facilitated discussion (with visuals as needed), demonstration, class discussion, hands-on guided practice, and feedback.

Texas only: The maximum student-instructor ratio in a lecture setting is 30 to 1. In a laboratory setting, the maximum student-instructor ratio is 20 to 1.

Grading

Key Graded Assignment: Interpreter Project	30%
Key Graded Assignment: Game Engine Research Project**	30%
Quizzes	20%
In-Class and Out-of-Class Activities	20%

** Indicates that this Key Graded Assignment has a research component.

At the end of each course, each student is assigned a final grade as follows:

Grade	Quality Points	Point Range	Interpretation
A	4.0	93-100	Excellent
A-	3.7	90-92	
B+	3.3	87-89	
B	3.0	83-86	Above average
B-	2.7	80-82	
C+	2.3	77-79	
C	2.0	73-76	Average
C-	1.7	70-72	
D+	1.3	66-69	
D	1.0	60-65	Below average
F	0.0	59 & below	Failure
I	0.0		Incomplete

Course Completion Requirements

Students must achieve a passing grade of D or above by completing all required examinations, submitting all required lab exercises and projects, and meeting the standards of the school attendance policy.

Attendance and Classroom Policies

Students are expected to adhere to the attendance and tardiness policies stated in the current catalog. This course consists of 108 in-class hours. Students that miss more than 10% of class time (10.8 hrs.) will be issued a written warning in the form of a SAR. Students that miss more than 20% of class time (21.6 hrs.) will be dropped from the course.

Supplemental materials for this course can be found on the Web at:

<http://homepage.mac.com/tsinclair/SG400/SG400.html>

Students are expected to manage their time sufficiently well to meet the assignment deadlines set by the instructor. **Work is due on the day assigned. If it is late, you will receive a grade of zero for that assignment. Therefore, even if you aren't done, hand in what you have on the due date.**

All written assignments (unless otherwise specified) must be provided in PDF format with your name included in the name of the file (ex. Dbarco3DGames.pdf). Assignments not meeting either or both of these requirements will be discarded.

Course Topics

Week 1

Introduction to Compilers and Interpreters (Library Research)

Week 2

Scanning

Week 3

Symbol Table

Parsing Expressions

Week 4

Parsing Statements

Parsing Declarations

Week 5

Parsing Programs, Procedures, and Functions

Week 6

Interpreting Declared Procedures and Functions

Week 7

Interpreting Control Statements and the Standard Procedures and Functions

Week 8

Machine Architecture and Assembly Code

Week 9

Compiling Procedures, Functions, Assignment Statements, and Control Statements

The above course guide may be changed at the discretion of the instructor to fit the needs of the class. In addition, students will also be responsible for the content of any supplemental materials provided by the instructor unless otherwise stated.

I, _____, have received and read the course syllabus and understand those policies outlined in it.

signature