

**Second Exam Study Guide
CISC 471 Compiler Design
Spring 2008**

1. References

- a. Classtime notes and slides from April 15 through May 15.
- b. Readings listed on schedule for topics covered in class so far
- c. Project 2, symbol table exercise, compiler case study slides online
- d. Quizzes

2. Topic Coverage

- compiler handling of scope through the symbol table construction and management
- runtime storage management – static, stack and heap
- activation records and runtime stack management with method calls/returns
- heap allocation and garbage collection
- implementing oop languages: inheritance graph, implementation of dynamic dispatch
- case studies of different publicly available compilers
- optimizing the optimizer – Guest: John Cavazos
- An optimizing compiler for parallel programs – Guest: Antony Danalis
- Using dynamic compilers for software testing – Guest: Ben Breech
- General compiler overview questions

3. Format of Exam

The exam is closed book, closed neighbor and you will have the full class period to work. In general, the exam will be a combination of testing your basic knowledge and understanding of the concepts covered in class and application of the concepts. Here are some sample questions:

- Short answer.
- What are some possible data structures for a symbol table for a single method
- What is needed in the symbol table design for whole programs that have static scoping with blocks and methods
- How are the operations implemented – insert, lookup, exitblock, enterblock
- Which data objects are most appropriately stored in static, stack, and heap
- contents of an activation record
- how method calls/returns are implemented
- how access to variables with static scoping is handled at runtime
- how different (reference counting and mark-sweep) garbage collectors work and their advantages/disadvantages
- object layout and dispatch (virtual) table structures and how they are created/used for dynamic dispatch and oop
- showing understanding of terminology related to these concepts
- outline the actions for a particular syntax construct to translate to iloc

How to Study

Review notes and slides; practice performing some of the activities above, reviewing what you did on the project, using the textbook as backup for understanding.