Course Outline and Syllabus

CS 4240: Compilers and Interpreters (3 credit hours)

- Instructor Contact Information:
    - Prof. Santosh Pande (E-mail: santosh@cc.gatech.edu)
    - Office : KACB 2338
    - Office hours: Monday, Wednesday : 1 to 2 pm
- TA Contact Information:
    - Christopher Porter (E-mail: cporter35@gatech.edu)
    - TA Office and Hours: TBD

Learning objective: To learn the theory and practice behind building automatic translators (compilers) for higher level programming languages and to engineer and build a complete compiler in Java.

Topics

- Front End: Compiler phases and overall working, Scanners (Regular Expressions, NFA/DFA, Scanner Generators), Parsers (Grammars, Ambiguity Removal, LL, LR and other deterministic parsing), Semantic Analysis (Symbol Tables, Syntax Driven Analysis, Type Systems, Attribute Grammars)
- Middle End: Intermediate Forms, Syntax Directed Translation, Translation of: Expressions, Control Structures and Back-patching, Function and Procedure Calls, Runtime Organization
- Back-end: Instruction Selection, Register Allocation, Code layout and Code Generation, Instruction Scheduling, Brief Introduction to Code Optimizations

Course Material:

- **Required textbook:**
  Modern Compiler Implementation in Java [Hardcover]
  Authors : Andrew W. Appel And Jens Palsberg
  Publisher**:** Cambridge University Press; 2nd edition (October 21, 2002)
  ISBN-10**:** 052182060X
  ISBN-13: 978-0521820608
- **Supplement :** Course slides and handouts: To be posted on T-square

Workload and grading:

- Home-works: About 4-5 exercises (some of them could involve programming, some just paper and pencil exercises): 25% weightage
- Mini-projects: A series of mini-projects to build a complete working compiler – spread out throughout the semester, work in teams of 2 students: 30% weightage
- Midterm Examination: 20 % weightage (topics until intermediate forms)
- Finals: 25% weightage (comprehensive covering all the topics)

Policies: Class absences minimize, Be on time to class, Internet off policy, Georgia Tech Honor Code