CSE 535: Programming Languages - **Fall** 2002

Instructor:

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Course Description:

Modern topics in programming languages such as: object-oriented languages, functional programming logic programming, parallel programming, concurrent programming in a distributed environment, formal syntax and semantics, exception handling, client- server programming. Prerequisites: CSE 231, 335 and 343.

Course Objectives:

Tentative topics to be covered in the fall semester of 2002 includes

1. Syntax
2. Operational semantics
3. Denotational semantics
4. Axiomatic semantics
5. (*Constraint*) logic programming
6. *Functional programming*
7. Abstract interpretation: Galois connections, Upper closure operators
8. Domain operations: reduced product, down-set completion, functional dependency, pseudo-complementation
9. Analysis of imperative programs: available expressions analysis, reaching definitions analysis, very busy expressions analysis, live variables analysis
10. Analysis of logic programs: groundness analysis, mode analysis, sharing analysis, type analysis

Course materials:

No textbook is required. Materials will be drawn from reference books and articles in literature. The following are useful reference books.

[NN] Hanne Riis Nielson and Flemming Nielson: Semantics with applications – A formal introduction, http://www.daimi.au.dk/~hrn.

[NNH] Flemming Nielson, Hanne Riis Nielson, Chris Hankin: Principles of Program Analysis. Springer, (450 pages, ISBN 3-540-65410-0), 1999. A web-based analysis engine PAG/WWW is accessible from http://pag.cs.uni-sb.de.

[NM] Ulf Nilsson and Jan Maluszynski: Logic, Programming and Prolog 2nd edition, http://www.ida.liu.se/~ulfni/lpp.

[MS] Kim Marriott and Peter Stuckey: Programming with Constraints: An Introduction. MIT Press, ISBN: 0262133415, 476 pages, 1999

[ASU] Aho, Sethi and Ullman: Compilers – Principles, Techniques and Tools. Addison-Wesley, 1986.

Assessment:

Students are assessed based on reports on projects they are given. There also will a few assignments on basic theories.

Attendance:

Attendance is expected. You are responsible for anything you missed due to your absence.

Important Dates:

Lecture hours: 5:30-7:17PM, Tuesdays and Thursdays
Class room: 384 SEB
Office hours: 2 PM – 3PM, Wednesday
Thinks-giving recess: November 27-December 1.
First class: Tuesday, September 3.
Last class: Tuesday, December 10.
Final report: due on Tuesday, December 17