# Programming Languages

Comprehsive Exam Syllabus

Revised: September 1, 2017

## 1   Topics

1. Lexical analysis and syntax specifications. BNF.

2. Parsing: top-down and bottom-up.

3. Knowledge of the Scheme programming language.

4. Recursively specified programs.

5. Scoping and binding of variables. Lexical address.

6. Data abstraction. Concrete and abstract syntax.

7. Parameter passing variations.

8. Stack-based runtime environment augmented with dynamic heap memory allocation.

9. Environments: Environment passing interpreters. Closures.

10. Continuations. Continuation passing interpreters.

11. Transformation to continuation passing style.

12. Type inference.

13. Object-oriented programing: in-depth knowledge of some object-oriented language.

## 2   References

1. *Essentials of Programming Languages, 3rd Ed*, Daniel P. Friedman and Mitchell Wand, MIT Press, 2008. (For topics 3-12 above)

2. Any book that covers lexical analysis, top-down and bottom-up parsing. For example: *Concepts of Programming Languages, 9th Ed*, Robert W. Sebesta, Addison-Wesley, 2010.