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Fall 2012

### CS 3180/5180: Comparative Languages

Krishnaprasad Thirunarayan

*Wright State University - Main Campus*, [t.k.prasad@wright.edu](mailto:t.k.prasad@wright.edu)

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## CS 3180/5180 Comparative Languages

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- Instructor : T. K. Prasad
  - Phone No. : (937)-775-5109
  - Email : [t.k.prasad@wright.edu](mailto:t.k.prasad@wright.edu)
  - Home page: <http://www.cs.wright.edu/~tkprasad/>
  - Quarter : Fall, 2012
  - Class Hrs : MW, 6:10 - 7:30pm, 154 Russ Center
  - Office Hrs : MW, 3:00 - 4:00pm, 395 JC (or by appt.)
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### Course Description

This course will introduce fundamental concepts and paradigms underlying the design of modern programming languages. For concreteness, we study the details of an object-oriented language (e.g. Java, C#, C++), a functional language (e.g. Scheme), and get introduced to multiparadigm languages (e.g., Python, Scala). The overall goal is to enable comparison and evaluation of existing languages. The programming assignments will largely be coded in Java and in Scheme, and optionally in Python or Scala.

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### Prerequisites

- Data Structures and Algorithms. (Equivalently, CS3100/5100.)
  - Experience with programming in imperative languages such as C/C++, Pascal, or Ada.
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### Course Material

1. On-line Lecture Notes
2. [OOP Basics](#)

### References

1. K. Arnold, J. Gosling, and D. Holmes: The Java Programming Language. Addison-Wesley Publishing Co., 4th Edition, 2005. ISBN 0-321-34980-6
  2. Michael L. Scott, Programming Language Pragmatics. Morgan Kaufmann Publishers, 2nd Edition, 2006. ISBN 0126339511
  3. [The Java Tutorial](#)
  4. Ravi Sethi, Programming Languages: Concepts and Constructs. Addison-Wesley Publishing Co., 2nd Edition, 1996. ISBN 0-201-59065-4
  5. R. Kent Dybvig, [The Scheme Programming Language](#), 3rd Edition. Prentice Hall, 2003.
  6. [Scheme : Language Reference Manual](#)
  7. [Chez Scheme Download Site \(http://www.scheme.com\)](http://www.scheme.com)
  8. [DrScheme Download Site \(http://www.drscheme.org/\)](http://www.drscheme.org/)
  9. [Jython Home Page](#)
  10. [Dive into Python](#)
  11. [Scala](#)
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### Relevant Websites

- [The Teaching About Programming Languages Project](#)
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### Course Load

The course load includes programming assignments worth 30 points, a midterm worth 30 points and a final worth 40 points. Normally, graduate students are assigned additional homework problems and are expected to solve additional/different problems in the tests.

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### Grading

The letter grades will be assigned using the following scale: A[90-100], B[80-90), C[70-80), D[60-70), and F[0-60). However, I reserve the right to adjust the scale somewhat to utilize the gaps in the distribution. Academic dishonesty will be "rewarded" with a grade of "F". "Sharing/reuse" of solutions to assignment problems is strictly prohibited.

### Attendance Policy

All registered students are expected to attend all lectures. In case a student is absent from a lecture due to unavoidable circumstances, the student is still responsible for the material covered in the class, as it is typically available from the course web-page well in advance. Furthermore, the student is expected to find out about in-class announcements from their colleagues/instructor.

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### Class Schedule and Syllabus

	Topic
Class 1	<a href="#">Evolution of Programming Languages</a>
Class 2	<a href="#">Syntax Specification : Grammars</a>

Class 3	<a href="#">Object-Oriented Programming</a>
Class 4	(continue)
Class 5	<a href="#">Symbolic Data; List Processing</a>
Class 6	<a href="#">Styles : Functional vs Procedural</a>
Class 7	<a href="#">Recursive Definitions ( Scheme-Startup )(Examples)</a>
Class 8	<a href="#">Abstraction : Higher Order Functions</a>
Class 9	Scoping; Closures
Class 10	(cont'd)
Class 11	<a href="#">Java Design Goals</a>
Class 12	<a href="#">Types, Values, Variables</a>
Class 13	<b>Midterm (Oct 8)</b>
Class 14	Arrays; Classes
Class 15	<a href="#">Inheritance; Polymorphism</a>
Class 16	Interfaces; <a href="#">Packages</a> ; <a href="#">Strings</a>
Class 17	<a href="#">Exceptions</a>
Class 18	<a href="#">Threads</a>
Class 19	(continue)
Class 20	<a href="#">(Scripting vs Systems PL)</a>
Class 21	Multiparadigm Languages: Python
Class 22	Multiparadigm Languages: Scala
Class 23	<b>Type Inference</b>
Class 24	SCHEME INTERPRETER (2/3 classes)
Class 25	<a href="#">Code (scm/txt)</a>
Class 26	Hand Written Slides ( <a href="#">83M pdf</a> ) ( <a href="#">43M pdf</a> )
Class *	Parameter Passing Mechanisms
Class *	Implementing Subprograms
	<b>Final (Dec 12, 5:45pm-7:45pm)</b>

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## Assignments (Fall 2012)

- [Assignment 1](#)
  - [Assignment 2](#)
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## Exams (Summer 2012)

- [Midterm](#)
  - [Final](#)
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[T. K. Prasad](#)