

**Concordia University  
Department of Computer Science  
and Software Engineering**

**Comparative Study of Programming Languages  
COMP 6411 --- Winter 2014**

**Contact Information**

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office hours: ---J--- 11:00-13:00, EV-3-221  
lectures: --W---- 17:45-20:15, FG-B-055  
laboratory: TBD

**Calendar Description**

Comparison of several high-level programming languages with respect to application areas, design, efficiency, and ease of use. The selected languages will demonstrate programming paradigms such as functional, logical, and scripting. Static and dynamic typing. Compilation and interpretation. Advanced implementation techniques. A project.

**Topics (tentative)**

History/Genealogy of programming languages: Actors, Main branches, Paradigms, Evolutions, Differences.

Paradigms: Procedural (imperative), Object-oriented, Aspect-Oriented, Functional, Reflective, List.

Evaluation methods: Foundation: Turing machine, von Neuman architecture, Compilation, Interpretation, Static/Dynamic typing, Runtime systems, Garbage collection, Dynamic memory allocation, Dynamic binding, Dynamic linking, Distributed computing, Parallel computing.

## Grading

Examination	30%
Programming assignments (4 X 10%)	40%
Team project (paper: 20%, presentation: 10%)	30%

Examination: There is a single examination that will occur when all lectures discussing the material have been covered. The examination will cover all course material.

Programming Assignments: There are four (4) programming assignments, each one dedicated to the writing of programs to solve the same problem in two different programming languages. The aim being to realize by concrete programming experience the differences between the two programming languages in question. The programming assignments are individual work.

Team Project: You have to form a team of exactly 5 students and select 10 different programming languages. The aim of the project is to conduct a detailed comparative study of the 10 languages chosen by the team. This project is graded according to two deliverables: a technical paper presenting the comparative study (20%) and an oral presentation in class presenting the results of your study (10%).

## Bibliography

- [1] R. Sebesta. Concepts of Programming Languages. Addison-Wesley, 10<sup>th</sup> edition, 2012.
- [2] J. Paquet. Course notes for COMP 6411. Concordia University, 2010-2013.
- [3] L.B. Wilson, R.G. Clark. Comparative Programming Languages. Addison Wesley. Third Edition, 2000.
- [4] S.H. Roosta. Foundations of Programming Languages. Thomson Learning Inc. 2003.
- [5] K.C. Loudon. Programming Languages, Principles and Practice. PWS Publishing Company. 1993.