

THEORY OF PROGRAMMING LANGUAGES

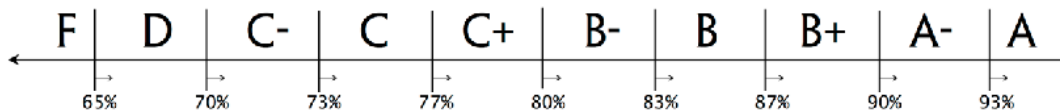
CMPT 331 • SPRING 2022

-Background

When and where	Wednesdays at 8AM and Fridays at 11AM in Hancock 1021	
Required Text	<i>Concepts of Programming Languages</i> , by Robert W. Sebesta, any recent edition Published by Addison Wesley – ISBN 9780133943160	
Web site	http://www.labouseur.com/courses/tpl	
Instructor	Alan G. Labouseur Hancock 3007 Office hours are posted.	Alan.Labouseur@Marist.edu 845-575-3832 <i>Marist</i> 845-440-1102 <i>home office</i>

-Grades

Letter Grades



You can earn up to 1000 points, broken down as follows:

Programming In The Past	20.0%	200 points	[1, 2]
Fun with Lambda Calculus	10.0%	100 points	[1, 2, 5]
Functional Programming	20.0%	200 points	[1, 2]
Mid-term Exam	15.0%	150 points	[1, 2, 5]
Final exam	20.0%	200 points	[1]
Language Design Project	10.0%	100 points	[1]
Attendance & Participation	2.5%	25 points - for quality and quantity	[1]
Laziness & Whining	2.5%	25 points - for not (lazy or whining)	[1]

-Themes, Objectives, and Assessment

Assessment methods include assignments, quizzes, exams, discussions, presentations, peer review, and projects.

[References] refer to Department of Computing Technology Goals available at <http://www.labouseur.com/courses/goals.pdf>

In this course I hope that you will . . .

- learn about and practice programming language criticism based on four domain-independent categories and use this knowledge and practice to better understand today's software development environment. [1, 2]
- explore the concepts of many historical programming languages and their impact on the languages of today, remembering that those who forget the mistakes of history are doomed to repeat them. [1, 2]
- avail yourself of the opportunity to develop small programs in many historical programming languages. [1, 2]
- engage in the philosophy of programming languages. [1, 2]
- evolve critical debugging skills by developing programs in many languages. [1, 2]
- enhance your continuing education skills, realizing that capable problem solvers never stop learning. Additionally, preparation and presentation of the projects, as well as participation in class discussions and assignments, requires at least a little research, so there's that to look forward to. [1, 2, 5]
- have fun with programming. [1, 2]

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-Schedule

#	Wed	Fri	Chapters	Topics	Due Friday
0	19-Jan	21-Jan	1	Introduction • Criteria for programming language evaluation Issues and tradeoffs in prog. language design • Compiler Phases	—
1	26-Jan	28-Jan	2	A brief history of programming languages	—
2	2-Feb	4-Feb	3	Describing syntax • Fruit flies • Chomsky • Grammars • Sheep	—
3	9-Feb	11-Feb	3 4	Derivations • Parse trees • Grammar ambiguity Lexical Analysis and Parsing	—
4	16-Feb	18-Feb	3 4	Beginning semantics • The need for context-sensitive grammars Attribute grammars • Operational Semantics (and Java bytecodes)	—
5	23-Feb	25-Feb	4	Axiomatic Semantics	<i>Programming In The Past</i>
6	2-Mar	4-Mar	4	Axiomatic Semantics Review for the Mid-term exam	—
7	9-Mar	11-Mar	—	Mid-term Exam in HC 2023 Study sheet permitted; some restrictions apply.	—
8	16-Mar	18-Mar	—	<i>Spring Break</i>	—
9	23-Mar	25-Mar	15	Lambda Calculus, part $\lambda f x . (f x)$	—
A	30-Mar	1-Apr	15	Lambda Calculus, part $\lambda f x . (f (f x))$	—
B	6-Apr	8-Apr	15	Functional programming with LISP, ML, and Erlang	Fun with λ Calculus
C	13-Apr	15-Apr	15 16	More functional programming with Erlang Logic programming with Prolog • Unification concepts	—
D	20-Apr	22-Apr	5 6	A tour through the final project: Language Design Project Static and Dynamic type • Type Systems • Scope and Type checking	<i>Functional Programming</i>
E	27-Apr	29-Apr	9, 10 13	Subprograms • Parameter passing Concurrency • Threads	—
F	4-May	6-May	—	Review for the Final Exam Show off your awesome new language designs.	<i>Language Design Project</i>
∞	11-May		all of it	Final Exam at 8AM in HC 2023 Study sheet permitted; some restrictions apply.	—