# CSC3094-1 SP24 - Programming Languages

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**CSC 3094: Programming Languages**

**Spring 2024**

**4 units**

**Point Loma Nazarene University**

**College of Natural and Social Sciences**

**PLNU Mission**

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

**Instructor:**

Dr. Benjamin Mood

**bmood@pointloma.edu (mailto:bmood@pointloma.edu)**

619 849 2269

RS 216

**Meeting Times and Locations:**

**Lecture:**

**RS265 -** MWF: 8:30 – 9:35am

**Office Hours:**

M – 11:00am to 12:00pm (office), 12:15pm – 1:15pm (caf)

T –  12:30pm to 1:30pm (caf), 1:45pm – 2:45pm (office)

W - 11:00am to 12:00pm (office), 12:15pm – 1:15pm (caf)

R - 12:30pm to 1:30pm (caf), 1:45pm – 2:45pm (office)

F - 11:00am to 12:00pm (office), 12:15pm – 1:15pm (caf)

**Books:**

*Concepts of Programming Languages* by Robert W. Sebesta

**Course Description:**

This course in programming languages covers language design issues and language translators. Laboratories give students a practical understanding of programming language concepts as well as give experience in programming using several programming languages.

**Learning Outcomes:**

Students will be able to write correct and robust software.

Students will use the theory of algorithms and computation to solve problems.

Students will analyze the interaction between hardware and software.

**Department Mission:**

The Mathematical, Information, and Computer Sciences department at Point Loma Nazarene University is committed to maintaining a curriculum that provides its students with the tools to be productive, the passion to continue learning, and Christian perspectives to provide a basis for making sound value judgments.

**Additional Course Information:**

**Missed Classes:** Homework/Quizzes/Exams missed due to PLNU excused absences (i.e., sports teams, choirs, etc), can be made up. Missed Quizzes/Exams/etc. due to emergencies can be made up once the dean of students informs Dr. Mood that PLNU has approved the reason. Non-emergency missed exams will result in a zero. It is the student's responsibility to inform the professor of when they will be gone. Missed class activities, which are due to a non-dean of students approved-emergency situation, will result in a zero.

**Project:** The best way to truly understand what goes on in a compiler and a lot of techniques in programming languages is to write and explore code for a compiler. To that end, each student will be implementing a compiler partially in Java and mostly in C++ as a semester long project.

For C++ components, your code should work with the make file provided w/G++. (Note: some IDE's code will not compile with G++). You will be given a makefile that must actually make your program compile for each section of the compiler.

No part is meant to be done in one sitting or on one day.

**Other Assignments:** There will be other assigned assignments during class. They will be due 1 week from the time they are given out. In these assignments, you will get to explore other programming language concepts.

**Cheating:** Unless otherwise noted, talking and working with fellow students to understand concepts is OK. However, copying code from another student (or giving your code to another student) is not acceptable and will result in a staggering penalty of -100% on whatever assignment/exam it was. Although sharing code seems a "nice" to help a friend, the penalty applies to all involved. **Do not share your code with anymore. Do not let someone look at your code.** If you use online resources, you must site the direct URLs in the labs you turn in.

**Grading:**

| | |
|---|---|
| Compiler Project | 20% |
| Assignments | 10% |
| Midterm | 25% |
| Written Final | 20% |
| Programming Final | 25% |

Grading scale

| | |
|---|---|
| 93 – 100% | A |
| 90 – 92% | A- |
| 87 – 89% | B+ |
| 83 – 86% | B |
| 80 – 82% | B- |
| 77 – 79% | C+ |
| 73 – 76% | C |
| **70 – 72%** | **C-** |
| 67 – 69% | D+ |
| 63 – 67% | D |
| 60 – 62% | D- |
| 0   – 59% | F |

**PLNU Policies**

**STATE AUTHORIZATION**

State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students.  If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state.  It is the student's responsibility to notify the institution of any change in his or her physical location.  Refer to the map on State Authorization to view which states allow online (distance education) outside of California.

## INCOMPLETES AND LATE ASSIGNMENTS

Late work is not accepted.

## SPIRITUAL CARE

PLNU strives to be a place where students grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith.

If you have questions, a desire to meet with the chaplain, or if you have prayer requests, you can contact the Office of Student Life and Formation.

## PLNU COPYRIGHT POLICY

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

## PLNU ACADEMIC HONESTY POLICY⊛

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See Academic Policies for definitions of kinds of academic dishonesty and for further policy information.

## PLNU ACADEMIC ACCOMMODATIONS POLICY⊛

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue

an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course and/or if they do not wish to utilize some or all of the elements of their AP in that course.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC.

## SEXUAL MISCONDUCT AND DISCRIMINATION

Point Loma Nazarene University faculty are committed to helping create a safe learning environment for all students. If you (or someone you know) have experienced any form of sexual discrimination or misconduct, including sexual assault, dating or domestic violence, or stalking, know that help and support are available through the Title IX Office at pointloma.edu/Title-IX. Please be aware that under Title IX of the Education Amendments of 1972, it is required to disclose information about such misconduct to the Title IX Office.

If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact Counseling Services at counselingservices@pointloma.edu or find a list of campus pastors at pointloma.edu/title-ix

**Final Exam:** Wednesday 5/1 **at 7:30am**

The final exam date and time is set by the university at the beginning of the semester and may not be changed by the instructor. This schedule can be found on the university website and in th course calendar.  No requests for early examinations will be approved. Only in the case that a student is required to take three exams during the same day of finals week, is an instructor authorized to consider changing the exam date and time for that particular student.

**Class Enrollment:**

It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of F on the official transcript.

## CREDIT HOURS

In the interest of providing sufficient time to accomplish the stated Course Learning Outcomes, this class meets the PLNU credit hour policy for a 3 unit class delivered over 15 weeks. It is anticipated that students will spend a minimum of 37.5 participation hours per credit hour on their coursework.

## COURSE MODALITY DEFINITIONS

In-Person: Course meetings are face-to-face with no more than 25% online delivery.

Online: Coursework is completed 100% online and asynchronously.

Online Synchronous: Coursework is completed 100% online with required weekly online class meetings.

Hybrid: Courses that meet face-to-face with required online components.

## PLNU ATTENDANCE AND PARTICIPATION POLICY⊛

Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions, the faculty member will issue a written warning of de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation.

## Tentative Schedule

| Monday | Tuesday | Wednesday | Thu | Friday |
|---|---|---|---|---|
| Jan: 8<br>Chapter 1 | 9: | 10:<br>Bytecode & Interpreter & compiler project | 11: | 12<br>Interpreter Part 1 Start (Lab) |

**15 (no classes)** | 16 | 17 DFA/REGX/CFG/PDA/Turing Machines | 18 | 19 Interpreter Part 1 End

Interpreter Part 2 Start

DFA/REGX/CFG/PDA/Turi Machines

22 DFA/REGX/CFG/PDA/Turing Machines | 23 | 24 DFA/REGX/CFG/PDA/Turing Machines | 25 | 26 Interpreter Part 2 End

Scanner Start

(Lab)

2

Scanner Due

29 Chapter 4 | 30 | 31 Parser | 1 | Parser Part 1 start

(Lab)

9

Parser Part 1 Due

5 Chapter 5 | 6 | 7 Chapter 6 | 8 | Parser Part 2 Start

(Lab)

12 Chapter 6 | 13 | 14 Chapter 7 | 15 | 16 Chapter 7

| | | | | 23 |
|---|---|---|---|---|
| 19 | 20 | 21 | 22 | Parser due |
| Chapter 8 | | Chapter 9 | | Chapter 9 |

| 26 | 27 | 28 | 29 | 1 |
|---|---|---|---|---|
| Review | | NDSS | | **Midterm** |

| **4 (spring break)** | **5** | **6** | **7** | **8 (spring break)** |
|---|---|---|---|---|
| 11 | 12 | 13 | 14 | 15 |
| Chapter 11 | | Type Checker | | Type checker p1 start (Lab) |

| 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|
| Chapter 11 | | Chapter 12 | | Type checker p2 start |
| | | | | Type checker p1 due (Lab) |

| 25 | 26 | 27 | 28 | 29 |
|---|---|---|---|---|
| Chapter 12 | | Chapter 13 | **EASTER** | **EASTER** |

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **EASTER** | | Code Generator | | **Type checker due** |
| | | | | **Code gen p1** (Lab) |

| 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|

| Chapter 13 | | Chapter 15 | | Code gen p2 (Lab) |
| --- | --- | --- | --- | --- |
| 15 Chapter 15 | 16 | 17 Chapter 15 | 18 | 19 Code gen due |
| 22 TBD | 23 | 24 Review | 25 | 26 **Written Final** |
| 29 | 30 | 1 **Programming Final.** | 2 | 3 |

# Course Summary:

| Date | Details | Due |
| --- | --- | --- |
| Fri Jan 19, 2024 | 📝 **Interpreter, Part 1 (https://canvas.pointloma.edu/courses/72319/assignments/1012805)** ⬡ | due by 8:30am |
| Fri Jan 26, 2024 | 📝 **Interpreter, Part 2 (https://canvas.pointloma.edu/courses/72319/assignments/1013784)** ⬡ | due by 8:30am |

| Date | Details | Due |
|------|---------|-----|
| Fri Feb 2, 2024 | 📝 **Scanner (https://canvas.pointloma.edu/courses/72319/assignments/1014775)** ♿ | due by 8:30am |
| Fri Feb 9, 2024 | 📝 **Parser, Part 1 (https://canvas.pointloma.edu/courses/72319/assignments/1015086)** ♿ | due by 8:30am |
| Mon Feb 12, 2024 | 📝 **DFA/NFAs/RegXs (turn in ON PAPER in class) (https://canvas.pointloma.edu/courses/72319/assignments/1015943)** ♿ | due by 8:30am |
| Fri Feb 23, 2024 | 📝 **Parser, Part 2 (https://canvas.pointloma.edu/courses/72319/assignments/1017348)** ♿ | due by 8:30am |
| Mon Feb 26, 2024 | 📝 **Grammar Assignment (turn in on paper) (https://canvas.pointloma.edu/courses/72319/assignments/1019702)** ♿ | due by 8:30am |
| Fri Mar 22, 2024 | 📝 **Type Checker Part 1 submission (https://canvas.pointloma.edu/courses/72319/assignments/1025945)** ♿ | due by 11:59pm |
| Fri Mar 29, 2024 | 📝 **Type Checker Part 1 grade (https://canvas.pointloma.edu/courses/72319/assignments/1026741)** ♿ | due by 8:30am |
| Fri Apr 5, 2024 | 📝 **Tic Tack Toe, goto style! (https://canvas.pointloma.edu/courses/72319/assignments/1027328)** ♿ | due by 8:30am |
| | 📝 **Type Checker Part 2 (https://canvas.pointloma.edu/courses/72319/assignments/1027825)** ♿ | due by 8:30am |
| Fri Apr 12, 2024 | 📝 **Code Gen 1 (https://canvas.pointloma.edu/courses/72319/assignments/1029282)** | due by 8:30am |

| Date | Details | Due |
|---|---|---|
| | 🧑 | |
| Fri Apr 19, 2024 | 📝 **Code Gen 2** **(https://canvas.pointloma.edu/courses/72319/assignments/1031178)** 🧑 | due by 8:30am |
| Mon Apr 29, 2024 | 📝 **Optimization** **(https://canvas.pointloma.edu/courses/72319/assignments/1031443)** 🧑 | due by 8:30am |
| Wed May 1, 2024 | 🚀 **That Final Thingy.** **(https://canvas.pointloma.edu/courses/72319/assignments/1040410)** 🧑 | due by 10am |
| | 📝 **Final Turnin Spot** **(https://canvas.pointloma.edu/courses/72319/assignments/1040411)** 🧑 | due by 10:05am |
| | 🚀 **Honorlock test** **(https://canvas.pointloma.edu/courses/72319/assignments/1040296)** 🧑 | |
| | 📝 **Midterm Grade** **(https://canvas.pointloma.edu/courses/72319/assignments/1025445)** 🧑 | |
| | 📝 **Programming Final** **(https://canvas.pointloma.edu/courses/72319/assignments/1037371)** 🧑 | |
| | 📝 **Written final** **(https://canvas.pointloma.edu/courses/72319/assignments/1037370)** 🧑 | |