CS 280: Programming Language Concepts
Fall 2024

Syllabus

CS 280 - Programming Language Concepts
Prerequisites: CS 114 or CS 116 or IT 114 or equivalent with a grade C or better.
Conceptual study of programming language syntax, semantics and implementation. Course covers language definition structure, data types and structures, control structures and data flow, run-time consideration, and interpretative languages.

Course Instructor and Coordinator:

> **Dr. Bassel Arafeh**
> GITC, Rm. 4408
> E-mail: ba62@njit.edu
> Office Hours:
>> Tuesday: 1:10 pm to 2:10 pm
>> Wednesday: 10:00 am to 12:00 noon
>> Thursday: 1:10 pm to 2:10 pm
>> Or by Appointment

Textbook:

   T: Robert W. Sebesta, Concepts of Programming Languages, 12th Edition., Pearson, 2019.

References:

   The following sources are recommended as supporting references for the topics of the course.
   - **R1:** Nell Dale; Chip Weems; Tim Richard, Programming and Problem Solving with C++, 6th/7th Edition, Jones & Bartlett Learning.
   - **R2:** Michael D. Adams, Lecture Slides for Programming in C++ [The C++ Language, Libraries, Tools, and Other Topics] (Version 2021-04-01)
     http://www.ece.uvic.ca/~mdadams/cppbook

Goals for the Course:

 At the conclusion of this course, the successful (passing) student would have developed:
   1. Ability to recognize common features of different programming languages.
   2. Ability for learning new programming languages.
   3. Appreciation of the strengths and weaknesses of different programming languages.

4. Ability to apply programming language syntax and semantics concepts in the implementation of a specified programming language.
5. Ability to apply computer science concepts and software development fundamentals to produce computing-based solutions for some programming languages issues.

Major Topics:

- Common features of programming languages
- Language syntax and semantics
- Lexical and syntax analysis
- Variables bindings, scopes and lifetimes
- Data types
- Expressions, and assignment statements
- Control flow statements
- Subprograms
- Abstract data types
- Support for object-oriented programming
- Exception Handling

Weight of Each Course Component:

Projects Assignments	**30%**
Recitation Assignments	**20%**
Midterm	**20%**
Final	**30%**

Grading Scale:

A	**>= 88%**
B+	**82%-88%**
B	**76%-82%**
C+	**70%-76%**
C	**60%-70%**
D	**50%-60%**
F	**< 50%**

Course Format and General Policies

CS280 is being taught in lecture/lab format. Lectures will be held on **Tuesdays for all sections.** While recitation classes for all sections, except section 101, will meet on **Thursdays**, and the recitation class for section 101 will meet on **Tuesdays.** More detailed instructions related to recitation assignments (RAs), programming projects (PAs), vocareum environment and Exams will be given next.

1. **Recitation Assignments**

   Recitation Assignments (RA) are short programming assignments that will be graded as part of your final course grade. **There will be <u>9 recitation assignments</u> with a weight of <u>20%</u> of your total grade. A RA work will be posted on a recitation class day or before, and will be due five days from the recitation class day. An extended submission period of two days will be allowed after that with a penalty of 25% deduction from the student's score. Note, no RA submissions will be considered after the extended deadline for submission. See also the course calendar schedule for more details.**

2. **Projects Assignments**

   There will be 3 programming projects with a weight of **<u>30%</u>** of your total grade. All submissions are done through Canvas to the Vocareum Environment. **Extended submission period of PAs will be allowed after the announced due date with a fixed penalty of 25% deduction from the student's score <u>for 3 days.</u>** The schedule of posting the programming projects and their due dates are shown in the course calendar.

   Note: All programming assignments must be written in C++, and must be submitted through Canvas to the Vocareum Environment for automatic grading.

3. **Mid-term and Final Exams**

   All Exams are conducted online in the designated exam rooms. All exams require Respondus Lockdown Browser. Please read the following NJIT policy in regard to using Lockdown Browser as the proctoring method. The course will use the "New" quizzes engine on Canvas. The instructions required to prepare yourself for an online quiz with a Lockdown Browser are shown below.

   The common midterm will be on **Monday 4:00 pm - 5:30 pm – 10/21/2024**. The final exam date will be determined later on. However, the **Fall 2024** finals will be during the period **<u>December 15-21, 2024</u>**. **<u>Both exams MUST be taken by all students and cannot be rescheduled.</u>**

General Language for All Courses

NJIT policy requires that all midterm and final exams must be proctored, regardless of delivery mode, in order to increase academic integrity. Note that this does not apply to essay or authentic based assessments. Effective beginning Fall semester 2019,

students registered for a fully online course section (e.g., online or Hyflex mode) must be given the option to take their exam in a completely online format, with appropriate proctoring.

In this course you will be required to use the following proctoring method to ensure academic integrity for exams. Please see NJIT's response to questions about online proctoring here. See below for more information about how exams will be proctored in this course.

For "New" Quizzes in Canvas:

If a *New Quizzes* assessment requires the use of LockDown Browser, it will automatically launch from the student's regular browser session. At the end of the quiz, LockDown Browser will close, allowing the student to continue with their standard browser. To be clear, the LockDown Browser application must first be installed to the computer or device. But once installed, it will automatically launch (and close) as needed with New Quizzes.

1. Download and install LockDown Browser from this link:
   http://www.respondus.com/lockdown/download.php?id=264548414
2. Once your download and installation has finished, log into Canvas using your standard browser.
3. From your Dashboard or under "Courses", click on the course in which you have to take the exam that requires LockDown Browser.
4. After you enter the course, find the exam and click on it.
5. A new tab will open with a message stating "Assessment Loading". You will also see a pop-up window asking you to open Lockdown Browser. Click "Open Lockdown Browser".
6. Lockdown Browser will automatically launch and your quiz will be loaded into Lockdown Browser. Click "Begin" to take the quiz. Once a quiz has been started with LockDown Browser, you cannot exit until the "Submit Quiz" button is clicked.
7. If you are required to use a webcam (Respondus Monitor), you will be prompted to complete a Webcam Check and other Startup Sequence steps.

YWCC Tutoring for CS 280

Tutoring assistance is provided to CS 280 students through the College. Please visit the College page for Fall 2024 undergraduate tutoring scheduled periods at https://computing.njit.edu/tutoring.

Notes:

1. When you communicate with me by email, please include CS280-0xx where xx is your section number in the Subject line of any email you send me.
2. If your inquiry is about a recitation class material, a recitation assignment or C++ help, please contact your Recitation class Instructor first.
3. For tutoring assistance, visit the YWCC site for undergraduate tutoring.
4. You will have one calendar week from when a grade for any assignment or exam is posted on Canvas to raise any questions that you may have about your grade to me or the instructor of your recitation class. After that time, I will not discuss any grading changes.
5. You are responsible for any material that you miss if you don't attend a lecture or a recitation class.
6. **No request for an assignment submission extension will be considered, if it is not supported by a confirmed evidence from the Office of the Dean of Students.**
7. **Requests of waiving the late submission penalty will not be considered in most situations, specially, those submissions that are done with no history of activities for that assignment before.**
8. **If you need accommodations due to a disability please contact:**
    Marsha Williams-Nicholas, Associate Director of Office of Accessibility Resources and Services (OARS),
    e.mail: marsha.williamsnicholas@njit.edu
    (973) 596-2994
    Kupfrian Hall 201
    A Letter of Accommodation Eligibility from the office authorizing student accommodations is required.

Academic Integrity:

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu

Course Calendar:

Week	Date	Lect./Lab Topic	Textbook/ Reference Chapter	RA/PA	RA/PA Due Dates
1	September 3-9, 2024	**Lecture 1:** Introduction & Preliminaries	T: 1		
		Lab 1: Introduction to C++	R1: 2-3	RA1	9/9/2024 (Sec. 101: 9/7/2024)
2	September 10-16, 2024	**Lecture 2:** Describing Syntax	T: 3.1-3.3		
		Lab. 2: C++ Streams & Files	R1: 4	RA2	9/16/2024 (Sec. 101: 9/14/2024)
3	September 17-23, 2024	**Lecture 3:** Variables, Bindings & Scopes	T: 5 R1: 10.7, 10.8		
		Lab. 3: Functions and Arrays	R1: 8, 11	RA3	9/23/2024 (Sec. 101: 9/21/2024)
4	September 24-30, 2024	**Lecture 4:** Data Types	T: 6, 11.1-11.4 R1: 10-12		
		Lab. 4: Classes	R1: 12	RA4	9/30/2024 (Sec. 101: 9/28/2024)
5	October 1-7, 2024	**Lecture 5:** Lexical Analysis	T: 4.1-4.2		
		Lab. 5: PA 1-Building a Lexical Analyzer		PA 1 (Lexer)	10/18/2024 (Sec. 101: 10/16/2024)
6	October 8-14, 2024	**Lecture 6:** Operator Overloading, Generic Functions & Classes	T: 7.3, 11.5 R1: 16.1-16.3 R2: 2.4.3		
		Lab. 6: Implementation Issues of PA 1		RA5	10/14/2024 (Sec. 101: 10/12/2024)
7	October 15-21, 2024	**Lecture 7:** Syntax Analysis	T: 4.3		
		Lab. 7: Mid-term Review Examples & Exercise			
	Monday, 4:00-5:30 pm October 21, 2024	**Mid-term Exam**			
8	October 22-28, 2024	**Lecture:** No Lectures Due to Midterm Exam			
		Lab. 8: Recursion		RA 6	10/28/2024 (Sec. 101: 10/26/2024)

9	Oct. 29-Nov. 4, 2024	**Lecture 8:** **Expressions &** **Assignment Statements**	**T: 7**		
		Lab 9: **PA 2-Building a Parser**		**PA 2** **(Parser)**	**11/15/2024** **(Sec. 101:** **11/13/2024)**
10	November 5-11, 2024	**Lecture 9:** **Control Statements**	**T: 8** **R1: 5-7**		
		Lab. 10: **Using STL Containers**	**R1: 17**	**RA7**	**11/11/2024** **(Sec. 101:** **11/9/2024)**
11	November 12-18, 2024	**Lecture 10:** **Support for OPP:** **Inheritance**	**T: 12** **R1: 15.1-15.2** **R2: 2.9.1**		
		Lab 11: **PA 3: Mixed Mode** **Expressions**		**RA8**	**11/18/2024** **(Sec. 101:** **11/16/2024)**
12	November 19-25, 2024	**Lecture 11:** **Support for OPP:** **Polymorphism**	**T: 12** **R1: 15.3** **R2: 2.9.3**		
		Lab 12: **PA3-Building an** **Interpreter**		**PA 3** **Interp.**	**12/8/2024** **(Sec. 101:** **12/6/2024)**
13	Nov. 26-Dec 2, 2024	**Lab 13: Tues. 11/26/2024** **(for ALL)** **Inheritance & Polym.**		**RA 9**	**12/4/2024** **(All Sections)**
		Thanksgiving Recess **Begins**			
14	December 3-9, 2024	**Lecture 12:** **Exception Handling**	**T: 14.1-14.2** **R1: 16.4** **R2: 3.6.3**		
		Lab 14: **Final Exam Review** **Examples & Exercises**			
15	December 10-14, 2024	**Tues. 12/10/2024:** **Final Exam Review** **Lecture**			
		Thurs. 12/12/2024 **Reading Day 1**			
December 15-21, 2024		**Final Exams**			