Nanchang University
CS11: Computer Science and Programming
(Last Updated in Jan. 2024)

Credit: 6

Contact Hours

This course is composed of 24 lecture sessions, 3 tutorial sessions and 9 office contact hours. Each lecture session takes 2 contact hours in length; each tutorial session takes 3 contact hours in length; There will be a Q-A review session (3 contact hours) and Final Exam (3 contact hours) at the end of this term. This course has 72 contact hours in total.

Course Description

This subject is aimed at students with little or no programming experience. It aims to provide students with an understanding of the role computation can play in solving problems. It also aims to help students, regardless of their major, to feel justifiably confident of their ability to write small programs that allow them to accomplish useful goals. The class will use the Python programming language.

After completing this course, students are expected to achieve the following six major objectives:

1. Experiencing different languages for expressing computations;
2. Learning about the process of writing and debugging a program;
3. Learning how data can be transcribed and stored on internet;
4. Learning how to use simulations to shed light on problems that don't easily succumb to closed form solutions;
5. Learning about how to use computational tools to help model and understand data.

Note: This Syllabus is subject to change based on the needs of the class.

Required Textbook

Textbook: *Computer Science: An Overview,* by Glenn Brookshear and Dennis Brylow (2015). *12th Edition.*

Grading

•Assignment	10%
•Quizzes	10%
•Labs	20%

•Midterm   20%
•Final Exam   40%

Letter Grade	Grade Points
High Distinction	85-100
Distinction	75-84
Credit	65-74
Pass	50-64
Fail	0-49

Course Schedule

The course has 24 class sessions in total. All sessions are 2 contact hours in length. At the end of this term, there will be a Q-A review session(3 contact hours) and Final Exam (3 contact hours).
Note: the course outline and required readings are subject to change.

Class 1:
Goals of the course; what is algorithms; history of computing

Class 2:
Data Storage, bits and memory

Class 3:
Integers, Fractions, Binary

Class 4:
Computer Architecture, Machine Language

Class 5:
Floating point numbers, successive refinement, finding roots

Class 6:
History of Operating System

Class 7:
Architecture of Operating System

Class 8:
Coordinations

Class 9:
Network Fundamentals

Class 10:
Concepts of an Algorithms

Class 11:
Recursive and Iterative Structures, Testing and debugging

Class 12:
Midterm

Class 13:
Sorting Algorithms

Class 14:
Divide and Conquer: Merge Sort

Class 15:
Analysis of knapsack problem, introduction to object-oriented programming

Class 16:
Abstract data types, classes and methods

Class 17:
Programming Language Comparison

Class 18:
Language Implementation

Class 19:
Presenting simulation results, Pylab, plotting

Class 20:
Decimation

Class 21:
Software Engineering

Class 22:
Introduction to Database

Class 23:
Object-Oriented Databases

Class 24:
Course overview; what do computer scientists do?

Attending Policy

Regular and prompt attendance is required. Under ordinary circumstances, you may miss two times without penalty. Each absence over this number will lower your course grade by a third of a letter and missing more than five classes may lead to a failing grade in the course. Arriving late and/or leaving before the end of the class period are equivalent to absences.

Policy on "Late Withdrawals"

In accordance with university policy, appeals for late withdrawal will be approved ONLY in case of medical emergency and similar crises.

Laboratory Schedule

The lab reports have three parts, the pre-lab (to be completed on-line before the lab commences), the data and calculations and the post-lab. The pre-lab Assignment due when you enter the lab. You and your partner will work collaboratively on the data and post-lab sections and hand in one report for the two of you.

In order to do a good job in the experiments, it is essential that you come well prepared. Reading the experiment for the first time in lab will put you and your partner at a disadvantage and make it very difficult to complete the experiment on time.

If you have any technical questions on the pre-lab, data section or post-lab assignments, you are encouraged to ask the instructor.

Academic Honesty

Nanchang University expects all students to do their own work. Instructors will fail assignments that show evidence of plagiarism or other forms of cheating, and will also report the student's name to the University administration. A student reported to the University for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

General Expectations:

Students are expected to:
— Attend all classes and be responsible for all materials covered in class and otherwise assigned;
— Complete the day's required reading and assignments before class;
— Review the previous day's notes before class and make notes about questions you have about the previous class or the day's reading;
— Participate in class discussions and complete required written work on time;
— Refrain from texting, phoning or engaging in computer activities unrelated to class during the class period;

— While class participation is welcome, even required, you are expected to refrain from private conversations during the class period.

Special Needs or Assistance

Please contact the Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material. Our goal is to help you learn, not to penalize you for issues which mask your learning.