Jiangxi University of Science and Technology
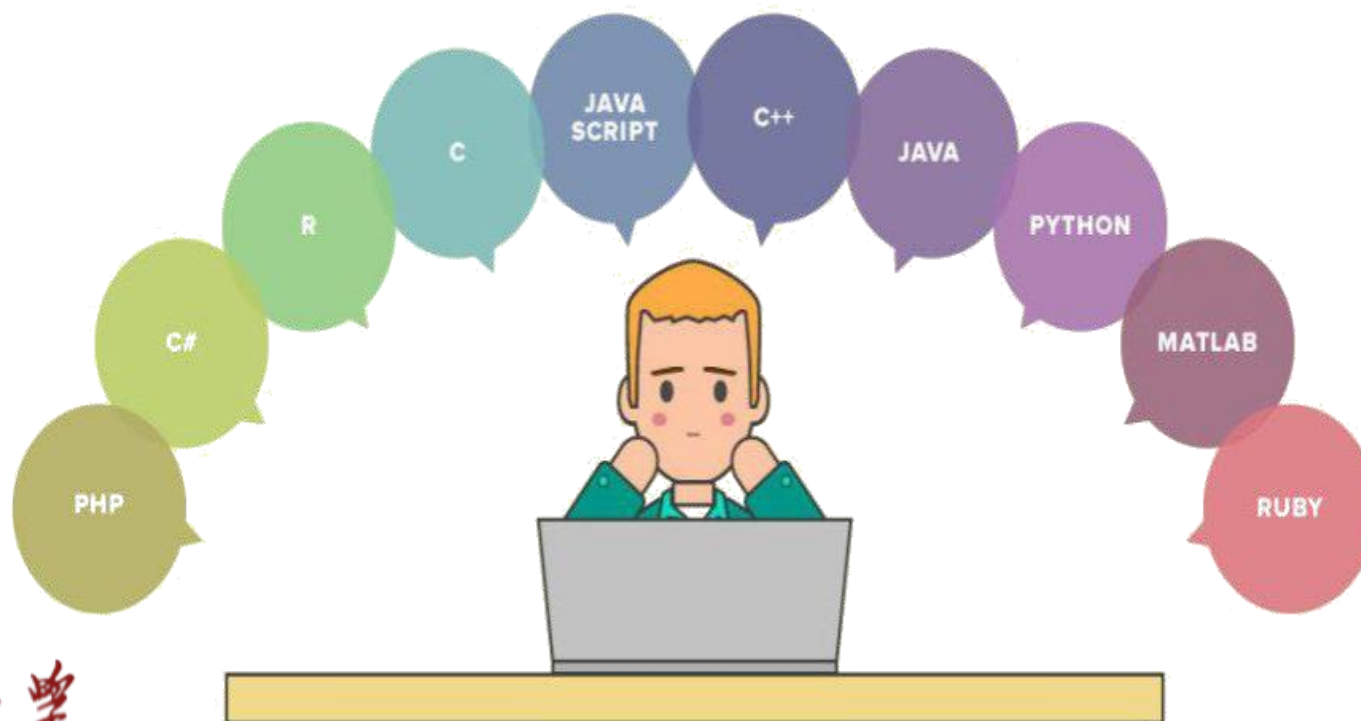
Ch01 Introduction to Computer Programming

Lecture0101 introduction / History and Programming Languages

THE C PROGRAMMING LANGUAGE

Nihau

- Let us have a brief view to our course

- Don't worry we will learn lots of thing this semester

Who Am I?

Dr. Ata Jahangir Moshayedi

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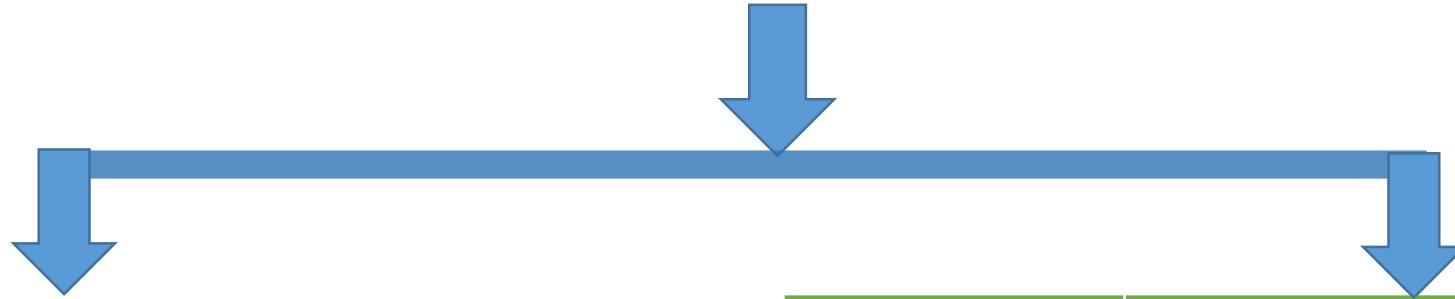
Visiting faculty of Azad University, IRAN

Researcher in the field of robotic and Automation

MSc. Instrumentation

BE. Power electronic

12/21/2021

Course Meeting Times

Subject: C Programming /C语言程序设计

| Date:	星期二Tuesday
Duration	（1-14W）
Time:	Period 1: 10:10-10.55 Period 2: 11:05-11:50

Date:	星期四Thursday
Duration	（1-14W）
Time:	Period 1: 10:10-10.55 Period 2: 11:05-11:50

- **huangjin campus**

2019-2020 school year 1st semester teaching week calendar

Week	Monday	Tuesday	Wednesday	Thursday	Friday	on Saturday	on Sunday	Remarks
1	2	3	4	5	6	Sep-07	Sep-08	
2	9	10	11	12	13	Sep-14	Sep-15	
3	16	17	18	19	20	Sep_21	Sep-22	
4	23	24	25	26	27	Sep-28	Sep-29	
5	30	1	2	3	4	Oct-05	Oct-06	
6	7	8	9	10	11	Oct-12	Oct-13	
7	14	15	16	17	18	Oct-19	Oct-20	
8	21	22	23	24	25	Oct-26	Oct-27	
9	28	29	30	31	1	Nov-02	Nov-03	
10	4	5	6	7	8	Nov-09	Nov-10	
11	11	12	13	14	15	Nov-16	Nov-17	
12	18	19	20	21	22	NOV_23	NOV_24	
13	25	26	27	28	29	Nov-30	Dec-01	
14	2	3	4	5	6	Dec-07	Dec-08	
15	9	10	11	12	13	Dec-14	Dec-15	
16	16	17	18	19	20	Dec-21	Dec-22	
17	23	24	25	26	27	Dec-28	Dec-29	
18	30	31	1	2	3	Jan-04	Jan-05	
19	6	7	8	9	10	Jan-11	Jan-12	

Weekly compilation

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Reference book

A First Book of ANSI C,
Fourth Edition
(Introduction to Programming)
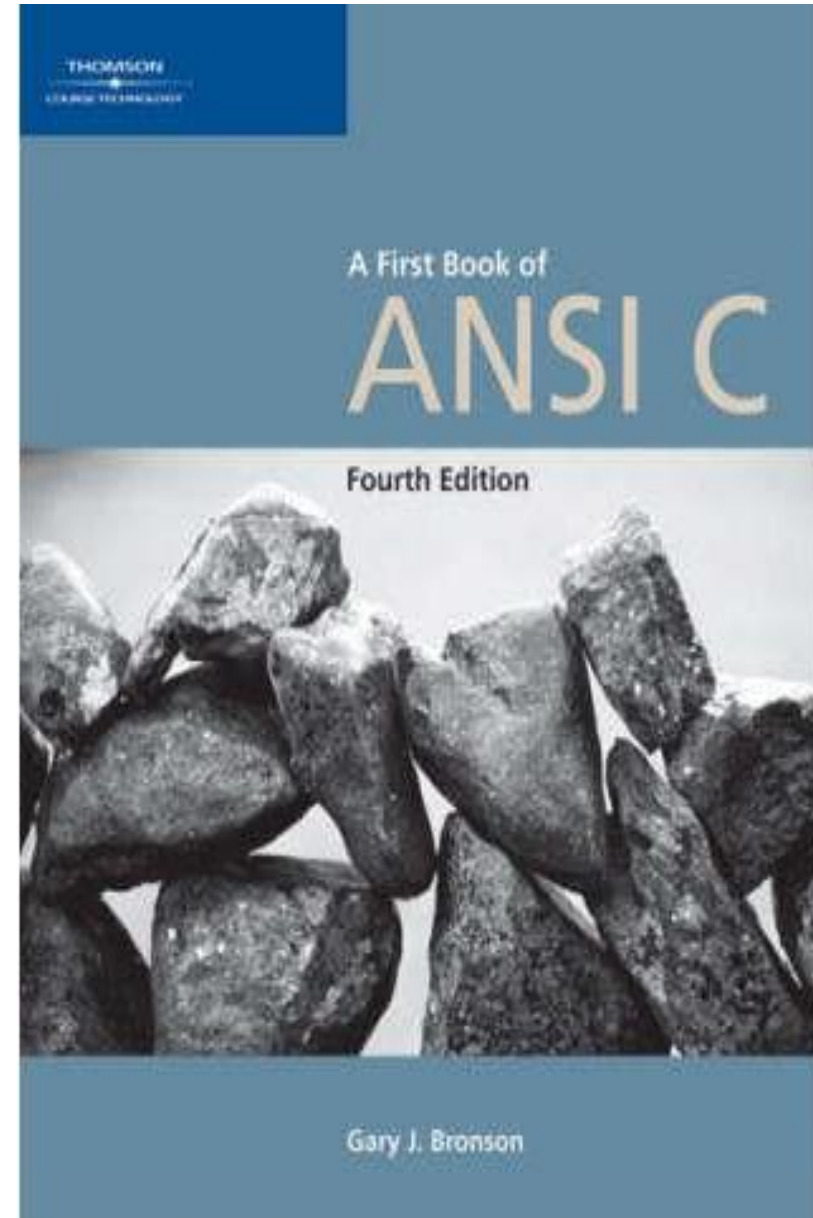
The C Language & Why we should learn

- Currently, the most commonly-used language for embedded systems
- "High-level assembly"
- Very portable: compilers exist for virtually every processor
- Easy-to-understand compilation
- Produces efficient code
- Fairly concise

Course Aims & Objectives

- This is a introductory course to the C programming language.
- At the end of this semester we have the goal to reach the below points:
  - By the end of this course, you should be able to:
  - Understand and use the basic programming constructs of C/C++
  - Manipulate various C/C++ datatypes, such as arrays, strings, and pointers
  - Isolate and fix common errors in C/C++ programs
  - Use memory appropriately, including proper allocation/deallocation procedures
  - Apply object-oriented approaches to software problems in C/ C++
  - Write small-scale C/C++ programs using the above skills

Course Mechanics

Learn and Enjoy

- You are responsible for all material presented in lectures. There will also generally be some extra notes in the problem sets building on the material that you should read before attempting the problem set.

- I strongly recommend that you attend labs, as you will almost certainly need help on the problem sets (C/C++ can be tricky!), but you are not required to stay for the entire lab.

ASSIGMENT

- There will become problem sets and a final project. You are encouraged to collaborate, but any code and write-ups you hand in must be your own.

- some of the assignment will be mentioned in the class during the lecture and some will be share with you in the group

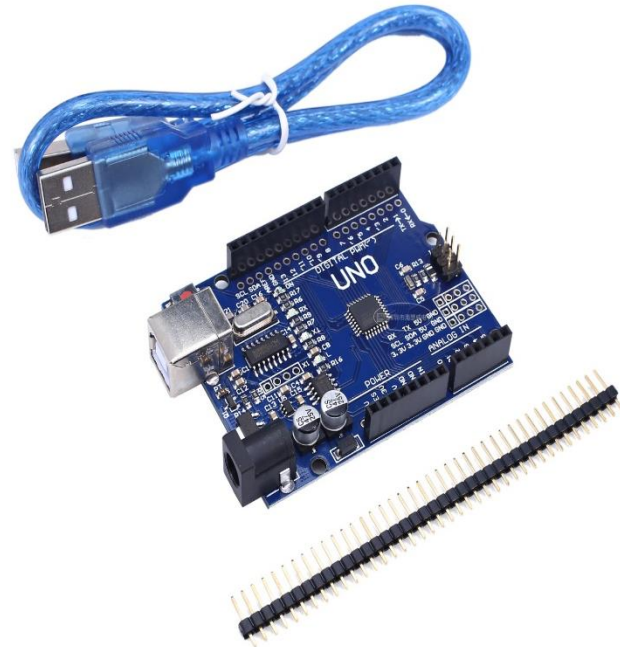- Please try to solve as much as you can and share your problem and difficulty with me

MY SPECIAL SUGGESTION

- Please try to buy a Arduino board and start to work with this board even may be you may have embedded course but you can learn so many thing with this board.

Arduino UNO R3 development board ATmega328P microcontroller improved version development learning control board

https://item.taobao.com/item.htm?spm=a230r.1.14.55.461ca7392hKNE r&id=533871686531&ns=1&abbucket=20#detail

￥ 22.90

Coding Environment

- Generally, software developers do their development work in some sort of "integrated development environment" (IDE), which will have many built-in tools for editing, compiling, running, and debugging programs. We recommend that you use the IDE known as Code::Blocks, which is freely available.

- You will also need to download the GNU C/C++ compiler (GCC). For Windows machines, you should use the MinGW version of it; you can install the version of Code::Blocks that comes bundled with MinGW, or follow the instructions here. If you're on a Mac, the easiest thing to do is install Xcode, which comes bundled with GCC. Xcode can be downloaded here (registration with Apple is required). If you're using Linux, you probably don't need our help on this one, and your operating system probably came with GCC anyway.

- There are many IDEs available besides Code::Blocks, and you may use any of them if you so desire. Another freely available one is Eclipse, which is very powerful and works on all operating systems, though many have had technical problems in the past with installing/using it for C++. (We recommend that you download the edition of Eclipse for C/C/C++ developers, but if you already have a different version of Eclipse, you can install the C/C/C++ add-ons through Eclipse's add-on manager.) On a Mac, you can simply use the Xcode IDE; on Windows you can use Microsoft Visual Studio on Windows (registration with Microsoft DreamSpark required). While all of these will serve the purpose well, we cannot guarantee that we will be able to help you with any problems that arise in the course of using them.

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THE COURSE :
WHY & WHAT & HOW

What is C Programming Language ? - The Basics

- C is a general-purpose programming language used for wide range of applications from Operating systems like Windows and iOS to software that is used for creating 3D movies.

- C programming is highly efficient. That's the main reason why it's very popular despite being more than 40 years old.

- Standard C programs are portable. The source code written in one system works in another operating system without any change.

- As mentioned, it's a good language to start learning programming. If you know C programming, you will not just understand how your program works, but will also be able to create a mental picture on how a computer works.

What will you gain if you learn C ?

If you don't know C, you don't know what you are doing as a programmer. Sure, your application works fine and all. But, if you can't say why while (*s++ = *p++); copies a string, you're programming on a superstition.
(Joel Spolsky's words, not mine).

Avram Joel Spolsky (born 1965) is a software engineer and writer. He is the author of *Joel on Software*, a blog on software development, and the creator of the project management software Trello. In 2008, he launched the Stack Overflow programmer Q&A site in collaboration with Jeff Atwood. Using the Stack Exchange software product which powers Stack Overflow, the Stack Exchange Network now hosts over 170 Q&A sites

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You will understand how a computer works.

- If you know C, you will not only know how your program works but, you will be able to create a mental model on how a computer works (including memory management and allocation). You will learn to appreciate the freedom that C provides unlike Python and Java.

- Understanding C allows you to write programs that you never thought were possible before (or at the very least, you will have a broader understanding of computer architecture and programming as a whole).

C is the lingua franca of programming.

- Almost all high-level programming languages like Java, Python, JavaScript etc. can interface with C programming. Also, it's a good language to express common ideas in programming. Doesn't matter if the person you are talking with doesn't know C, you can still convey your idea in a way they can understand.

Opportunity to work on open source projects that impact millions of people.

- At first, you may overlook the fact that C is an important language. If you need to develop a mobile app, you need Java (for Android), Swift and Objective C (for iOS). And there are dozens of languages like C#, PHP, ASP.net, Ruby, Python for building web application. Then, where is C programming?

- Python is used for making wide range for applications. And, C is used for making Python. If you want to contribute to Python, you need to know C programming to work on Python interpreter that impacts millions of Python programmers. This is just one example. A large number of software's that you use today is powered by C.

- Some of the larger open source projects where C programming is used are Linux Kernel, Python Interpreter, SQLite Database.

- Another language that's commonly used for large open source project is C++. If you know C and C++, you can contribute to large open source projects that impacts hundreds of millions of people.

You will write better programs.

- To be honest, this statement may not be true all the time. However, knowing how computer works and manage memory gives you insight on how to write efficient code in other programming languages.

You will find it much easier to learn other programming languages.

- A lot of popular programming languages are based on C (and C++, considered superset of C programming with OOP features).

- If you know C, you will get a head start learning C++.

- Languages like C# and Java are related to C and C++. Also, the syntax of JavaScript and PHP is similar to C.

- If you know C and C/C++ programming, you will not have any problem switching to another language.

NOW

- Welcome to be a coder

Reference

- BOOK
- Some part of this PPT given by Prof 欧 (**Chengtian Ouyang**)
- with special thank
- https://www.codingunit.com/c-tutorial hello-world