Francis Bacon

- Knowledge can be divided into two kinds: one is obtained from the Divine Revelation, the other is the knowledge from the workings of human mind.
- Man's understanding consists of three parts; history to man's memory, poetry to man's imagination and creation, and philosophy to man's reason.

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Compiling and Running of Program

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Professor

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1. **Have a glance at what the course is about?**
2. **Understand why need to study the course? (what you can achieve through studying the course)**
3. **Have an idea about how to study the course?**

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General Information

- **Bilingual Course**
- **Prerequisite**
  - **High-level Programming Languages (C)**
  - **Assembly Language**
  - **Data Structure**
  - **Algorithm Design**
  - **Operating System**
  - **Good English (mainly reading)**
- **Credits: 2**
- **Hours: 60**

General Information

- **Class time: Tuesday（**） & Thursday**
- **Class format**
  - **Lecture**
  - **Reading**
  - **Projects**
  - **Final Exam**

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C

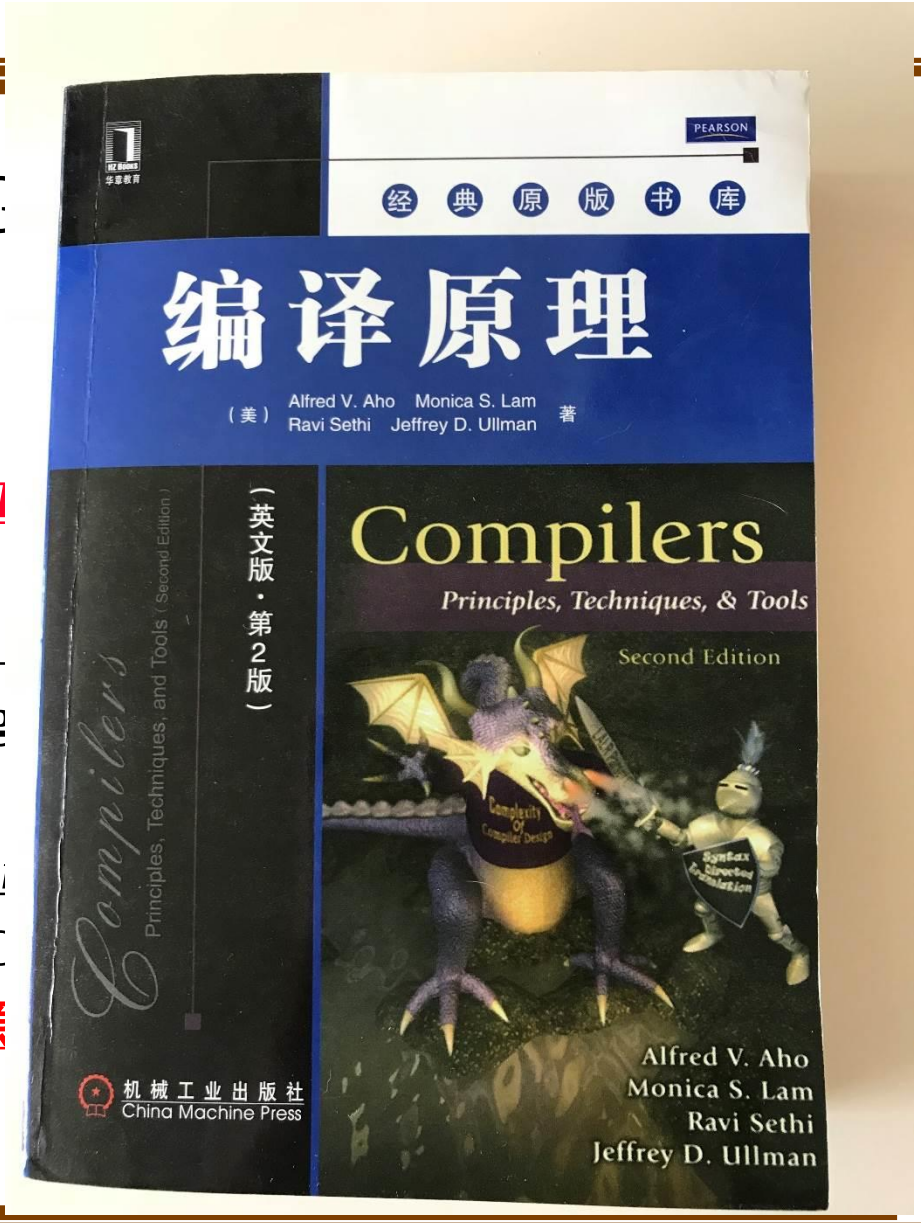
- **Optional Textbooks**

[1] Aho, Alfred V., Ravi Sethi,
Principles, Techniques and T
111-32674-8.

[2] Appel, Andrew W. *Modern*
Cambridge, UK: Cambridg
0521583888.

[3] Kenneth C. Louden. *Compi*
***Practice*. PWS Publishing C**

[4] 金成植 《*编译程序构造原*



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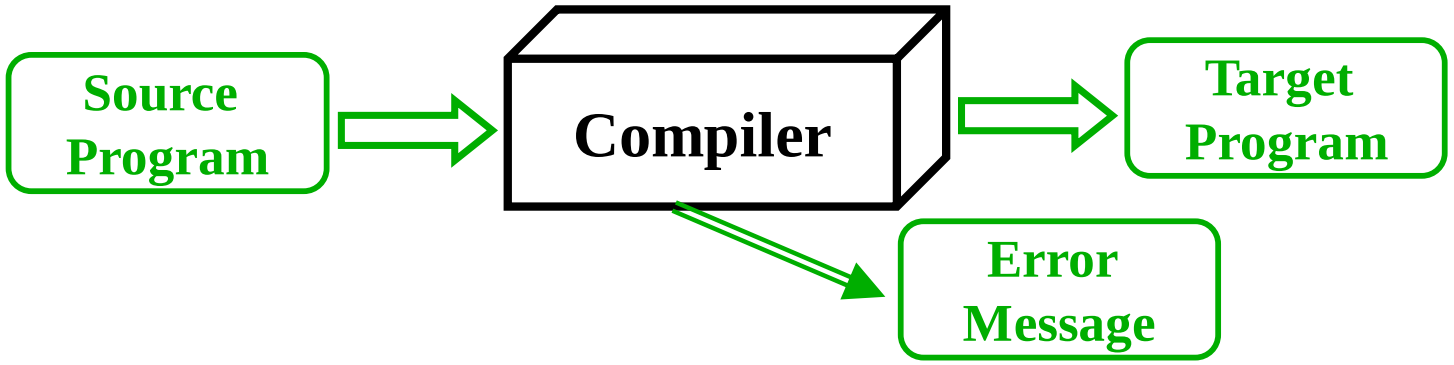
Course Outline

- **This course aims at**
  - **Introducing *general design principles*, *methods*, and *implementation techniques* in developing a compiler for a *high-level procedural programming language*;**
- **What is a compiler?**



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Course Outline

- **Main content**
  - **§ 1. Introduction to Compiler**
  - **§ 2. Scanning** ※
  - **§ 3. Parsing** ※
  - **§ 4. Top-down Parsing** ※
  - **§ 5. Bottom-up Parsing** ※
  - **§ 6. Semantic Analysis** ※
  - **§ 7. Intermediate Code Generation**
  - **§ 8. Intermediate Code Optimization**
  - **§ 9. Runtime Environment** ※
  - **§ 10. Target Code Generation** ※

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Why

Course Goals

- ***Learn compiler related techniques***
  - **Design, implementation, theory/method**
  - **How to *utilize* them in the future application**
- ***Understand high-level programming languages deeply***
  - **Design & implementation**
- ***Improve programming skills***
  - **The first time to have a chance to know about *meta-software system***
  - **The first time to know how to *Develop a complex, large scale, system software***
- **Application**
  - **Learn some easy ways to develop some applications**

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Application of DFA for some Problems

- ***Problem 1***: **Develop a program for checking whether a string is a binary number can be divided by 3;**

With DFA we can solve it!

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How to study the course

- Have a ***whole picture*** in mind!
- Do not treat this course as theoretical one, but treat it as a course for ***solving programming problems***!
- Be aware
  - **What** we are learning?
  - **Where** we can use it?
  - **How** different parts are connected to each other?
- ***Class attendance*** is very important!
- ***Preview*** and ***Read*** before each lecture!
- Solving problems after class independently! (homework)
- Do the projects for practice!

Some Issues

- **Teaching strategy**
  - **Outline → Problem → Discussion → General Method → Implementation Technique → Examples**
  - **Emphasis on principles, main idea;**
- **Learning method**
  - **The class will be divided into several groups;**
  - **Several topics (reading assignment) will be given;**
  - **Each group should finish one report;**
  - **Each group will have a chance to give presentation on the topic;**
  - **Each group should hand in its answers and questions;**
- **Projects**
  - **Scan;**
  - **Parsing;**

Some Issues

- **About class time**
  - **Require every student attend the class on time;**
  - **Welcome any comments/questions about the course at any time;**
  - **Keep a comfortable environment for teaching and learning;**
  - **Turn off or Vibrate Mobile phones;**

Course Materials

- **Video**
- **Syllabus (教学大纲)**
- **Dictionary for the course (most terms both in English and Chinese)**
- **Slides after each class**

Any Questions?