**100070003 Foundations of Computer Application**

**Lecture Hours: 20**

**Laboratory Hours: 12**

**Credits: 2**

**Prerequisite(s): None**

**Course Description:**

This course is a compulsory course for the students who are not majoring in computer or the correlative majors. The goal of this course is to guide students to understand the evolution, essential concepts, core methods and technology of computer science, making them understand the overview and branches of computer science, grasp relevant basic knowledge, and form Computational Thinking consciousness. The final purpose of this course is to foster the students’ interest to computer science and utilize the computer as an appliance and get them prepared for future study which may be related to computer science.

**Course Outcomes:**

After completing this course, a student should be able to:

1. Understand relevant knowledge of Computational Thinking.

2. Understand the definition and components of a computer, and the category of computers.

3. Understand the basic ideas in Information digitization

4. Understand the principles of computer organization.

5. Understand the definition and category of computer software, and the evolution and functions of operating systems.

6. Understand the basic concepts of algorithm design and programming languages.

7. Understand the concepts and typical models of computer networks and security.

8. Understand the concepts of database.

**Course Content:**

**Lectures and Lecture Hours:**

1 Problem Solving based on Computer 4

Problem description and abstraction

Problem solving method based on Computer

Domain knowledge of Computer Science

2 Foundation of Computer Information digitization 3

Number system and number system conversion

Binary numerical representation and calculation

Character information encoding and standard exchange

Multimedia information coding

Barcode and RFID

Information standardization

3 Computer working principle and hardware architecture 4

Development of computer and Turing machine model

Hardware composition of a computer

Basic working principle of computer

Microcomputer architecture

Performance indicators for Microcomputers

Parallel computer architecture

4 Computer software platform 4

Computer software platform overview

Data storage and file management

Program running management

Practical operating system

5 Computer network platform 4

Computer network platform

Internet and Its Applications

Information security

Cloud computing services

Internet of things based on network platform

6 Data processing and Data Base 5

Data and data processing

Multimedia data processing

Database technology foundation

Introduction to SQL

Data warehouse and data mining

WWW Database Technology

7 Computation and Computational Sciences 2

The nature of computation

About computational discipline

Pervasive computing and Its Applications

8 Algorithm and program design 4

Algorithm

Algorithm design of typical problems

Data structure

The general process of programming

9 Final review 2

**Grading:**

Final exam 60%

Experiments 10%

MOOC 20%

Quiz and attendance 10%

**Text & Reference Book:**

Li Fengxia, Chen Yufeng, Shi Shumin. College Computer, Higher Education Press, 2014

Li Fengxia. College Computer Experiment, Higher Education Press, 2014