目录

0010121 离散数学

课程编码： 0010121

课程名称： 离散数学

英文名称： The Discrete Mathematics

课程类型： 学科基础必修课

学分： 2.5   **总学时：** 45

面向对象： 信息安全（实验班）专业本科生

先修课程： 高等数学（工），线性代数（工）

考核形式： 平时成绩+考试

撰写人： 公备

课程简介：

离散数学属于理工科高等院校信息安全专业必修的、重要的学科基础课程，是以研究离散结构为对象的数学课程，与计算机科学理论、应用技术有着密切的联系。课程中的综合、分析、归纳、演绎、递推等方法在信息安全中有着广泛的应用，不仅为后续课程如：数据结构、操作系统、编译原理等做必要的理论准备，而且其课程内容中所提供的一些把科学理论应用于实践的范例可以培养学生逐步增强如何实施"科学理论——技术——生产力"转化的观念和方法，提高学生在知识经济时代中的适应能力，培养学生具有一定的解决实际问题的能力和创新能力、抽象思维和概括能力、严谨的数学推理的能力。

推荐教材或主要参考书：

[1] Kenneth H. Rosen，Discrete Mathematics and Its Applications: And Its Applications（英文影印版.第6版），机械工业出版社，2008年5月.

[2] 邵学才，《离散数学(第2版)》，电子工业出版社，2009，4

[3] 邵学才，叶秀明，《离散数学（第四版）》，机械工业出版社，2011

[4] [美] Richard Johnsonbaugh 石纯一等译，离散数学，人民邮电出版社，2009

[5] [美] Kenneth H. Rosen 著，袁崇义等译，《离散数学及其应用》，机械工业出版社，2002

[6] 左孝凌等，离散数学，上海科学技术文献出版社，1982

[7] 屈婉玲、耿素云、张立昂，《离散数学（第2版)》，清华大学出版社，2008

[8] 王元元，离散数学，机械工业出版社，2010

[9] Bemard Kolman, Robert C.Busby, Sharon Ross.Discrete Mathematical Structures, 高等教育出版社，2001

[10] 屈婉玲等，离散数学，高等教育出版社，2008

0010121 The Discrete Mathematics

Course Number: 0010121

Course Title: The Discrete Mathematics

Course Type: Discipline Requirements

Credit: 2.5   **Total Credit Hours:** 45

Students: Undergraduate students majoring in Information Security

Prerequisites: Advanced Mathematics, Linear Algebra

Evaluation Method: Course participation + written exams

Writer： Bei Gong

Course Description:

Discrete mathematics is a compulsory and important subject-based course for information security in universities of science and engineering. It is a mathematics course that deals with the study of discrete structures and is closely related to computer science theory and applied technology. Synthesis, analysis, induction in the course, Deduction, recursion and other methods have been widely used in information Security. Not only do necessary theoretical preparations for subsequent courses such as: data structures, operating systems, compilation principles, etc., but also some of the scientific theories provided in the course content The examples applied in practice can train students to gradually enhance the concepts and methods of how to implement the "scientific theory-technology-productivity" transformation, improve students' adaptability in the era of knowledge economy, and train students to have a certain ability to solve practical problems and Ability to innovate, abstract thinking and generalization, rigorous mathematical reasoning.

Recommended Textbooks/References:

[1] Kenneth H. Rosen，Discrete Mathematics and Its Applications: And Its Applications (English photocopy. 6th edition)，Machinery Industry Press, 2008,5.

[2] Shao Xuecai，Discrete Mathematics (2nd Edition), Electronic Industry Press,2009,4.

[3] Shao Xuecai，Ye Xiuming，Discrete Mathematics (Fourth Edition), Mechanical Industry Press，2011.

[4] [US] Richard Johnsonbaugh, Shi Chun, First Class Translation, Discrete Mathematics, People's Posts and Telecommunications Publishing House，2009.

[5] [US] by Kenneth H. Rosen, translated by Yuan Chongyi, "Discrete Mathematics and Its Applications", Mechanical Industry Press，2002.

[6] Zuo Xiaoling，Discrete Mathematics, Shanghai Scientific and Technical Document Press，1982.

[7] Qu Wanling，Geng Suyun，Zhang Liang, Discrete Mathematics (2nd Edition), Tsinghua University Press，2008.

[8] Wang Yuanyuan，Discrete Mathematics, Mechanical Industry Press，2010.

[9] Bemard Kolman，Robert C．Busby，Sharon Ross．Discrete Mathematical Structures，Higher Education Press，2001.

[10] Qu Wanling，etc., Discrete Mathematics, Higher Education Press，2008.

0005686 数字逻辑Ⅰ

课程编码：0005686

课程名称：数字逻辑Ⅰ

英文名称：Digital Logic Ⅰ

课程类型：学科基础必修课

学分： 3.0　　**总学时：** 48

面向对象：计算机类专业本科生

先修课程：模拟电子技术

考核形式： 平时成绩+考试

撰写人：王秀娟

课程简介：（250-300 字）

　　数字逻辑是计算机基础理论的一个重要组成部分,它为计算机组成原理等后续课程提供必要的逻辑基础。本课程的目标是要求学生掌握数字逻辑的基本概念和方法；掌握电路的抽象、分析、设计能力；掌握应用开发工具进行相应的仿真及应用的能力。课程的主要内容包括：必要的数制和码制知识，逻辑代数的基本定律、规则、常用公式、卡诺图，硬件描述语言的语法规则、三种基本建模方法，组合电路的分析与HDL设计，组合电路中的竞争与险象，触发器的工作原理、逻辑特性和硬件描述语言模型，典型时序电路的分析与HDL设计，基于状态机和HDL的一般同步时序电路的设计。

　　教学内容重点是逻辑代数的理论、知识，组合电路的分析与设计方法，同步时序电路的分析与设计方法，基于硬件描述语言的Verilog建模方法。教学内容难点是组合电路与时序电路的设计方法。

推荐教材或主要参考书：

[1] 王秀娟等. 数字逻辑基础与 Verilog 硬件描述语言（第 2 版）. 清华大学出版社，2020.6

[2] 彭建朝等. 数字电路的逻辑分析与设计. 北京工业大学出版社，2007.9

[3] M. Rafiquzzaman; Steven A. McNinch. Digital Logic: With an Introduction to Verilog and Fpga-Based Design. Wiley. 2019.9

0005686 Digital Logic

Course Number: 0005686

Course Title: Digital Logic Ⅰ

Course Type: Required course of subject basis

Credit: 3.0   **Total Credit Hours:** 48

Students: Undergraduate students majoring in Computer class

Prerequisites: Analog circuit technology

Evaluation Method: Course participation + written exams

Writer： Wang Xiujuan

Course Description:

   Digital Logic is one of the required courses of subject basis for undergraduate students Major in Computer class. The main target of this course is students mastering the basic concepts and methods of digital logic, mastering the abstraction, analysis, and design abilities of circuits and developing ability to apply development tools for corresponding simulations and applications. The teaching contents are mainly covered by the following aspects: numerical system and code system; the basic laws, basic rules and formulae commonly used of logic algebraic; Karnaugh map; grammatical rules of HDL; three basic modeling methods; the analysis of the combinational logic circuit and the HDL design; the hazard phenomenon in combination logic circuit; the operation principle of flip-flop; the logical performance and HDL model; the analysis of typical sequential circuits and HDL design; the design of general synchronous sequential logic circuits based on the state machine and HDL.

   The teaching contents are mainly covered by the following aspects: Theory and knowledge of logic algebra, analysis and design method of combinational circuit, analysis and design method of synchronous sequential circuit, Verilog modeling method based on hardware description language. The difficulties of teaching contents are described as followings: Design method of combinational circuit and sequential circuit.

Recommended Textbooks/References:

1. WANG Xiujuan, WEI Jianhua, JIA Xibin The basis of digital logic and Verilog hardware description language (The second edition). *Beijing: Tsinghua University Press*, 2020

2. PENG Jianchao. Logic analysis and design of digital circuits. *Beijing: Beijing University of Technology Press*, 2007

3. M. Rafiquzzaman;Steven A. McNinch. Digital Logic: With an Introduction to Verilog and Fpga-Based Design. *Wiley*. 2019.9

0010677 网络空间安全导论

课程编码： 0010677

课程名称： 网络空间安全导论

英文名称： Introduction to Cyberspace Security

课程类型： 学科基础必修课

学分： 2.0　　**总学时：** 32

面向对象： 信息安全（实验班）专业本科生

先修课程：

考核形式： 平时成绩+作业成绩+期末考试

撰写人： 林莉

课程简介：（250-300 字）

　　网络空间安全导论是信息学部为信息安全专业本科生开设的必修课程，也是其他专业学习信息安全知识的入门课程，是信息安全专业完整知识体系的绪论。本课程任务是使学生了解和掌握网络空间安全学科的内涵特点、信息安全专业涉及的主要学科知识、课程体系和人才培养基本要求等，旨在帮助学生了解网络空间安全技术的发展历史和沿革、树立信息安全专业的整体知识框架，明确信息安全专业大学毕业生应该具备的素质和能力，培养学生追求科学真理、热爱祖国，为保护网络空间安全努力奋斗的情怀，为后续其他专业课程学习打下坚实基础。教学内容重点：网络空间安全基础知识、信息安全技术体系以及密码学、系统安全、网络安全、内容安全等关键技术和网络安全法律法规。教学内容的难点：信息安全技术体系及关键技术。

推荐教材或主要参考书：

[1] 刘建伟等编著. 网络空间安全导论. 清华大学出版社. 2020.9

[2] 李剑 杨军主编. 网络空间安全导论. 机械工业出版社. 2020.12

[3] 沈昌祥等编著. 网络空间安全导论. 电子工业出版社. 2018.05

[4] 石文昌编著. 网络空间系统安全概论（第 3 版）. 电子工业出版社. 2021.1

[5] 朱建明等编著. 信息安全导论. 清华大学出版社. 2015.9

[6] 黄波等编著. 网络空间安全素养导论. 清华大学出版社. 2019.8

[7] 教育部高等学校网络空间安全学科专业教学指导委员会 编制. 高等学校信息安全专业指导性专业规范. 清华大学出版社. 2019.12

0010677 Introduction to Cyberspace Security

Course Number: 0010677

Course Title: Introduction to Cyberspace Security

Course Type: Required Course

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in information security

Prerequisites:

Evaluation Method: Course participation + homework evaluation + written exams

Writer：Li Lin

Course Description:

Introduction to Cyber Space Security is a required course set by Faculty of information for undergraduates majoring in information security.   It is also an introductory course for other majors to learn information security knowledge and an introduction to the complete knowledge system of information security major. The task of this course is to enable students to understand and master the characteristics of cyberspace security, the main subject knowledge，the curriculum system and the basic requirements of talent training involved in information security. It aims to help students understand the development history and evolution of cyberspace security technology, establish the overall knowledge framework of information security major, clarify the quality and ability that graduates of information security major should have, and train students to pursue science and truth, love the motherland, and strive for the protection of cyberspace security, laying a solid foundation for the follow-up study of other professional courses. The teaching contents are mainly covered by the following aspects: Basic knowledge of cyberspace security, information security technology framework, the key information security technologies such as cryptography, physical security, system security, network security, content security and cyberspace security laws and regulations. The difficulties of teaching contents are described as followings: information security technology framework and key technologies.

Recommended Textbooks/References:

1.Liu Jianwei et al., Introduction to cyberspace security. Tsinghua University Press. September 2020.

2. Li Jian and Yang Jun. Introduction to cyberspace security. China Machine Press. December 2020.

3. Shen Changxiang et al., Introduction to Cyberspace Security, Electronic Industry Press, May 2018.

4.Shi Wenchang, Introduction to System Security in Cyberspace (3rd Ed.), Electronic Industry Press, January 2021.

5.Zhu Jianming et al., Introduction to Information Security, Tsinghua University Press, September 2015.

6.Huang Bo et al., Introduction to Cyberspace Security Literacy, Tsinghua University Press, August

2019.

7.Ministry of education college cyberspace security discipline teaching steering committee, Information Security Professional Guidance Professional Norms, Tsinghua University Press, December 2019.

0007947 高级语言程序设计

课程编码：0007947

课程名称：高级语言程序设计

英文名称：High Level Language Programming

课程类型：公共基础必修课程

学分： 3.5　　**总学时：** 56

面向对象：计算机科学与技术（实验班）、物联网工程、信息安全、计算机大类

先修课程：无

考核形式： 平时成绩+阶段编程测验+期末考试

撰写人： 蔡越江

课程简介：

　　本课程依托 C 语言进行计算机科学的启蒙教育，初步培养学生的计算思维能力，训练程序设计的基本方法和技巧，使学生能够通过使用高级语言编写程序解决简单的实际问题，为解决复杂工程问题打下坚实基础。本课程在传授知识的同时，还要训练学生动手能力、培养分析问题和解决工程问题的能力，注重能力的培养、个性的发展。课程是后续理论和实践教学的基础和重要工具。课程主要内容包括 C 语言基础语法、三种基本的程序控制结构、数据的组织结构、函数、程序的组织结构、模块化的程序设计思想与方法、初识计算机算法以及程序的基本调试技巧等。

推荐教材或主要参考书：

[1] 廖湖声，叶乃文，周珺编著. C 语言程序设计案例教程(第 3 版). 人民邮电出版社, 2018 年 11 月

[2] 李文新等. 程序设计导引及在线实践(第 2 版). 清华大学出版社, 2017 年 1 月

[3] （美）Brian W.Kernighan,Dennis M.Ritchie 著. C 程序设计语言(英文版)(第 2 版). 机械工业出版社, 2006 年 8 月

[4] P.J.Deitel,H.M.Deitel 著. C 大学教程(第 5 版)(英文版). 电子工业出版社, 2010 年 5 月

0007947 High Level Language Programming

Course Number: 0007947

Course Title: High Level Language Programming

Course Type:

Credit: 3.5   **Total Credit Hours:** 56

Students: Undergraduate students majoring in computer science

Prerequisites: no

Evaluation Method: Course participation + Stage programming test +written exams

Writer：　Cai Yuejiang

Course Description:

High-level language programming is one of the public basic compulsory courses for undergraduate students Major in computer science. This course relies on the C language for computer science initiation education, initially cultivates students' computational thinking ability, trains the basic methods and skills of program design, enables students to write programs to solve simple practical problems, and lays a solid foundation for solving complex engineering problems. While imparting knowledge, this course also trains students' hands-on ability, develops the ability to analyze and solve engineering problems, and emphasizes the cultivation of abilities and the development of individuality. The course is the foundation and important tool for subsequent theoretical and practical teaching. The teaching contents are mainly covered by the following aspects: C language basic grammar, three basic program control structures, data organization structure, function, program organization structure, modular program design ideas and methods, first understanding of computer algorithms and basic debugging skills of programs

Recommended Textbooks/References:

1. Liao Husheng, Ye Naiwen, and Zhou Jun. C Language Programming Case Tutorial (3rd Edition). People's Posts and Telecommunications Publishing House, November 2018

2. Li Wenxin, etc. Program Design Guide and Online Practice (2nd Edition). Tsinghua University Press. January 2017

3. Brian W. Kernighan, Dennis M. Ritchie. C Programming Language (2nd Edition). Machinery Industry Press. August 2006

4. P.J.Deitel, H.M.Deitel. C University Course (5th Edition). Electronic Industry Press. May 2010

0010734 模拟电子技术

课程编码：0010734

课程名称：模拟电子技术

英文名称：Analog Electronic Technology

课程类型：学科基础必修课

学分： 2.0 **总学时：** 32

面向对象：计算机科学与技术（实验班）专业、计算机科学与技术专业、信息安全（实验班）专业、物联网工程专业本科生

先修课程：电路分析基础-1

考核形式： 平时成绩+闭卷考试

撰写人：李硕朋

课程简介：（250-300 字）

模拟电子技术是信息学部计算机学院为计算机科学与技术、信息安全、物联网工程专业本科生开设的学科基础必修课。本课程的任务是使学生掌握模拟电子技术的基本理论和分析方法，培养学生模拟电子技术设计的创新精神、思维能力、分析和解决实际问题能力。教学内容重点是模拟电子技术的基本理论和基本分析方法。教学内容的难点是模拟电子电路的分析、设计方法。

推荐教材或主要参考书：

[1] 童诗白,华成英. 模拟电子技术基础（第五版）.高等教育出版社.2015 年

0010734 Analog Electronic Technology

Course Number: 0010734

Course Title: Analog Electronic Technology

Course Type: Compulsory course

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in Computer Science and Technology (Experimental class), Computer Science and Technology, Information Security (Experimental class), and Internet of things Engineering

Prerequisites: Fundamentals of Circuit Analysis

Evaluation Method: Course participation + written exams

Writer： Shuopeng Li

Course Description:

Analog electronic technology is a basic compulsory course offered by the School of Computer Science, Department of Information Techonology, for undergraduate students majoring in computer science and technology, information security, and Internet of Things engineering. The mission of this course is to enable students to master the basic theories and analysis methods of analog electronic technology, and to cultivate students' innovative spirit, thinking ability, analysis and practical problem-solving abilities in analog electronic technology design. The teaching content focuses on the basic theory and basic analysis methods of analog electronic technology. The difficulty of the teaching content is the analysis and design methods of analog electronic circuits.

Recommended Textbooks/References:

1. Tong shibai, Hua chengying. Fundamentals of Analog Electronics (Fifth Edition.). Higher Education Press. 2015

0008186 数据结构与算法

课程编码： 0008186

课程名称： 数据结构与算法

英文名称： Data Structure and Algorithm

课程类型： 学科基础必修课

学分： 3.5   **总学时：** 56

面向对象： 计算机科学与技术（实验班）专业、计算机科学与技术专业、信息安全（实验班）、物联网工程专业本科生

先修课程： 高级语言程序设计、集合与图论

考核形式： 平时成绩+笔试

撰写人： 苏航

课程简介：

数据结构与算法分析是信息学部为计算机科学与技术、物联网工程、信息安全专业本科生开设的必修课程类型，对于学生的专业能力的培养具有重要作用。本课程是面对非数值性处理问题形成的一门学科，其主要目的是培养学生的计算思维、系统分析与设计、算法设计与分析、程序设计与实现专业基本能力。主要内容涉及基本数据结构、排序、索引、检索、高级数据结构等内容，从逻辑结构的角度系统介绍线性表、字符串、二叉树、树和图等各种基本数据结构；从算法的角度系统地介绍各类排序、检索和索引算法；从应用的角度介绍更复杂的数据结构与算法分析技术。通过本课程的学习，学生应该掌握数据结构与算法的基本概念、合理组织数据的基本方法、高效处理数据的基本算法、并具备面对实际问题选择恰当数据结构与相应算法的能力。

推荐教材或主要参考书：

[1] 张铭、王腾蛟、赵海燕，数据结构与算法，高等教育出版社，2011 年 1 月。

[2] 严蔚敏、吴为民，数据结构（C 语言版），人民邮电出版社，2017 年 8 月。

[3] 张乃孝、裘宗燕，数据结构—C++与面向对象的途径，高等教育出版社，2003 年 4 月。

[4] Clifford A S. 数据结构与算法（C++）2 版，电子工业出版社，2010 年 1 月。

[5] Michael Main, Data Structures & Other Object Using C++(3Rd Edition)，清华大学出版社，2007 年 1 月。

0008186 Data Structure and Algorithm

Course Number: 0008186

Course Title: Data Structure and Algorithm

Course Type: Required Courses

Credit: 2.0   **Total Credit Hours:** 60

Students: Undergraduate students majoring in Computer Science and Technology, Internet of Things Engineering, Information Security.

Prerequisites: High-level Language Programming, Data Structures and Algorithms

Evaluation Method: Course participation + written exam

Writer: Hang Su

Course Description:

    The Data Structure and Algorithm is one of the required courses for undergraduate students Major in the College of Computer Sciences of Faculty of Information Technology. This course faces non-numerical processing problems. The main target of this course is to clarify cultivating students' basic abilities in computational thinking, system analyzing and design, algorithm design and analyzing, program design and realization. The main content involves basic data structure, sorting, indexing, retrieval, advanced data structure, etc. From the perspective of logical structure, it systematically introduces various basic data structures such as linear tables, strings, binary trees, trees and graphs; systematically from the perspective of algorithms introduce various sorting, retrieval and indexing algorithms; introduce more complex data structures and algorithm analysis techniques from the perspective of application. Through the study of this course, students should master the basic concepts of data structures and algorithms, the basic methods of rationally organizing data, the basic algorithms for efficiently processing data, and the ability to choose appropriate data structures and corresponding algorithms in the face of practical problems.

Recommended Textbooks/References:

1. Zhang Ming,Wang Tengjiao, Zhao Haiyan. Data Structure and Algorithm. Beijing. Higher Education Press. 2011.1.

2. Yan Weimin, Wu Weiming. Data Structure(C). Tsinghua University Press，2017.8.

3. Zhang Naixiao, Qiu Zongyan. Data Structure - C++ and Object-Oriented Approach. Beijing, Higher Education Press. 2003.4.

4. Clifford A S. Data Structure and Algorithm（C++）(2nd Edition). Beijing. Publishing House of Electronics Industry. 2010.1.

5. Michael Main, Data Structures & Other Object Using C++(3rd Edition). Beijing, Tsinghua University Press. 2007.1.

0007739 计算机组成原理

课程编码：0007739

课程名称：计算机组成原理

英文名称：Principles of Computer Organization

课程类型：学科基础必修课

学分： 3.0 **总学时：** 48

面向对象：计算机类专业本科生

先修课程：数字逻辑

考核形式：平时成绩+考试

撰写人：朱文军

课程简介：（250-300 字）

计算机组成原理是信息学部为计算机科学与技术专业、信息安全专业、物联网工程专业本科生开设的一门学科基础必修课。本课程的任务是使学生深入理解计算机各功能部件的组成及实现原理，建立计算机整机概念，通过实例学习计算机系统的设计及其相关的技术，并掌握指令系统的功能、格式、寻址方式等基本概念。教学内容重点：计算机系统的硬软组成、计算机内部数据信息表示、数值运算方法、运算器原理、控制器原理及工作过程、存储器工作原理、存储器字位扩展、输入输入系统功能及常见控制方式。教学内容的难点：运算器原理、控制器原理及工作过程，存储器工作原理、存储器字位扩展。

推荐教材或主要参考书：

[1] 易小琳，朱文军，鲁鹏程，方娟，毛国君，计算机组成原理与汇编语言，清华大学出版社，2009 年 3 月

[2] [美] 戴维·A. 帕特森（David A. Patterson），约翰·L. 亨尼斯(John L. Hennessy)，计算机组成与设计：硬件、软件接口（英文版-原书第 4 版），机械工业出版社，2012 年 1 月

0007739 Principles of Computer Organization

Course Number: 0007739

Course Title: Principles of Computer Organization

Course Type: Compulsory course

Credit: 3.0　　　　　**Total Credit Hours:** 48

Students: Undergraduate students majoring in Computer Science and Technology, Information Security, Internet of things Engineering

Prerequisites: Digital logic

Evaluation Method: Course participation + written exams

Writer： Zhu Wenjun

Course Description:

Principles of computer organization is one of the compulsory courses for undergraduate students Major in computer science and technology, information security and internet of things engineering. The main target of this course is to make students understand each functional unit, the composition and implementation principle of computer. This course is focus on making students grasp the design method of the computer system and its related technology, and master the function, format and addressing mode of the instruction system. The teaching contents are mainly covered by the following aspects: the hardware and software components of the computer system, the representation of the internal data information of the computer, the numerical operation method, the principle of the arithmetic unit, the principle and working process of the controller, the working principle of the memory, the expansion of the memory capacity, the functions of the input and output system and common control methods. The difficulties of teaching contents are described as followings: the principle of the arithmetic unit, the principle and working process of the controller, the working principle of the memory, the expansion of the memory capacity.

Recommended Textbooks/References:

1. Yi xiaolin, Zhu wenjun, Lu pengcheng, Fang juan, Mao guojun, Principles of Computer Organization and Assembly Language, *Tsinghua University Press*, 03-2009.

2. David.A.Patterson,John.L.Hennessy,Computer Organization and Design:The Hardware/Software Interface (Fourth Edition), *China Machine Press*, 01-2012.

0010114 计算机网络（双语）

课程编码： 0010114

课程名称： 计算机网络（双语）

英文名称： Computer Networks

课程类型： 学科基础必修课

学分： 2.5   **总学时：** 40

面向对象： 信息安全（实验班）本科生

先修课程： 计算机组成原理

考核形式： 平时成绩+考试

撰写人： 段立娟

课程简介：

计算机网络是计算机学院为信息安全专业本科生开设的必修课程类型。本课程的任务是使学生能够对计算机网络原理与技术有一个系统的、全面的了解；掌握计算机网络的概念、组成、网络体系结构、网络系统结构各层的作用，理解各种应用背后的基础技术和理论。教学内容重点：网络体系结构、OSI 参考模型及 TCP/IP 协议、物理层、数据链路层、网络层、传输层以及应用层协议。教学内容的难点： 数据链路层协议的基本原理和典型协议、多路访问协议、路由算法及协议、Internet 的网络层协议、TCP 协议。

推荐教材或主要参考书：

[1] Andrew S. Tanenbaum , Davi J. Wetherall 编著.严伟，潘爱民译.计算机网络(第 6 版).清华大学出版社，2022 年 6 月 1 日出版

[2] 谢希仁. 计算机网络（第 7 版）. 电子工业出版社，2017 年 1 月

0010114 Computer Networks

Course Number: 0010114

Course Title: Computer Networks

Course Type: Compulsory course

Credit: 2.5   **Total Credit Hours:** 40

Students: Undergraduate students majoring in Information Security

Prerequisites: Principle of computer composition

Evaluation Method: Course participation + written exams

Writer： Lijuan Duan

Course Description:

Computer network course is a compulsory course for undergraduate students Major in information security. The main task of this course is to clarify the principle and technology of computer network; to master the concept, composition, network architecture, the role of each layer of network system structure, and the basic technology and theory behind various applications. The teaching contents are mainly covered by the following aspects: network architecture, OSI reference model and TCP / IP protocol, the details of physical layer, data link layer, network layer, transmission layer and application layer protocol. The difficulties of teaching contents are described as followings: basic principles and typical protocols of data link layer protocol, multiple access protocol, routing algorithm and protocol, Internet protocol and TCP protocol.

Recommended Textbooks/References:

1.Edited by Andrew S. Tanenbaum, Nick Feamster，Davi J. wetherall, translated by Yan Wei and pan Aimin, computer network (6th Edition), Tsinghua University Press, 1st June November 2022.

2.Xie Xiren, computer network (Seventh Edition). Beijing: Electronic Industry Press, January 2017.

0010701 信息安全数学基础

课程编码：0010701

课程名称：信息安全数学基础

英文名称：Mathematic Foundations for Information Security

课程类型：学科基础必修课

学分： 2.5　　**总学时：** 45

面向对象：信息安全（实验班）专业本科生

先修课程：高等数学（工），线性代数（工）

考核形式：平时成绩+考试

撰写人：张兴兰

课程简介：（250-300 字）

　　信息安全数学基础是信息学部位信息安全专业本科生开设的基础必修课程。旨在为信息安全专业学生补充必要的数学基础，提高认识、分析和解决信息安全问题的能力。本课程的主要任务是通过讲解与密码技术相关的数学知识，掌握初等数论的基本概念、基本理论及其基本应用，提高学生的数学素养，为专业学习奠定数学基础。教学的重点：数论基础、代数结构的基本概念和性质。教学内容的难点：数学理论在实践中进行安全分析与设计的思想和方法。

推荐教材或主要参考书：

[1] 陈恭亮 编著，信息安全数学基础，清华大学出版社，2010 年。

[2] 潘承洞 潘承彪 编著，《初等数论》，北京大学出版社，1992 年。

0010701 Mathematic Foundations of Information Security

Course Number: 0010701

Course Title: Mathematic Foundations of Information SecurityX

Course Type: Discipline Requirements

Credit: 2.5   **Total Credit Hours:** 45

Students: Undergraduate Students Major of Information Security

Prerequisites: Advanced Mathematics, Linear Algebra

Evaluation Method: Course participation + written exams

Writer： Xinglan Zhang

Course Description:

Mathematic Foundations for Information Security is a basic compulsory course for undergraduate students Major in information security. It provide students some necessary mathematical foundation used in other major courses. Primarily, the main task of this course is serve to cryptography. Teaching focus: Fundamentals of number theory, basic concepts and properties of algebraic structure. The difficulty of teaching content: how to apply the mathematic idea and method to the practice analysis and design.

Recommended Textbooks/References:

1.Chen Gongliang, Fundamentals of information security mathematics, Tsinghua University Press, 2018.

2.Pan Chengdong, pan Chengbiao, elementary number theory, Peking University Press, 1992.

0010065 操作系统原理及安全

课程编码：0010065

课程名称：操作系统原理及安全

英文名称：Principle and Security of Operating System

课程类型：学科基础必修课

学分： 3.0 　**总学时：** 48

面向对象：信息安全（实验班）专业本科生

先修课程：汇编语言程序设计，高级语言程序设计，计算机组成原理，数据结构与算法，网络空间安全导论

考核形式： 平时成绩+实验+考试

撰写人：侍伟敏

课程简介：（250-300 字）

  操作系统原理及安全被列为信息安全专业的学科基础必修课，在计算机知识结构中有着重要的地位和作用，是信息安全专业课程的重要基础。本课程要求学生掌握"操作系统原理及安全"中的基本概念、基本理论和基本方法，在操作系统级的资源管理层面上再认识计算机资源分配的相关工作原理、运行过程以及安全保障机制，培养学生初步具备操作系统分析、设计、开发的能力以及解决系统安全问题的能力。教学主要内容包括操作系统的进程管理、内存管理及安全、文件管理及安全、I/O 设备管理。其中难点包括异常机制、系统调用、进程同步与互斥、进程间通信、死锁的处理方法、非连续内存管理及保护机制、页面置换算法、文件结构、文件存取方法、SPOOLing 技术、基于权限位的访问控制。

推荐教材或主要参考书：

[1] Abraham Silberschatz、Peter Bear Galvin、Greg Gagne 著，郑扣根译、唐杰、李善平译.《操作系统概念》（原书第 9 版）. 机械工业出版社. 2018 年 07 月.

[2] 费翔林、骆斌.《操作系统教程》（第 5 版）. 高等教育出版社. 2014 年 02 月.

[3] 汤小丹, 梁红兵, 哲凤屏, 汤子瀛.计算机操作系统(第四版). 西安: 西安电子科技大学出版社, 2014 年 05.

[4] 石文昌. 信息系统安全概论（第 2 版）. 电子工业出版社，2014 年 02 月.

0010065 Principle and Security of Operating System

Course Number: 0010065

Course Title: Principle and Security of Operating System

Course Type: Discipline Requirements

Credit: 3.0   **Total Credit Hours:** 48

Students: Undergraduate students majoring in Information Security

Prerequisites: Assembly Language Programming, High Level Language Programming, Principles of Computer Organization, Data Structures and Algorithms, Introduction to Cyberspace Security

Evaluation Method: Course participation +experiment+ written exams

Writer： Weimin-Shi

Course Description:

This course are listed as compulsory courses in the discipline of information security, playing an important role in the structure of computer knowledge and serving as an important foundation for information security courses. The main target of this course is to clarify the basic concepts, basic theories, basic methods, main functions, implementation technologies and security guarantee mechanisms on operating systems, and then make further students with the ability to analyze, design and develop and to solve security problems of operating systems. This course is focus on the operation system mechanism of multi-user and multi-tasking, and strategies, methods and characteristics of system resource management, and related technologies to ensure the security of operating systems. The teaching contents are mainly covered by the following aspects: process management, memory management and security, file management and security,, I/O device management. The difficulties of teaching include exception mechanism, system call, process synchronization and mutual exclusion, inter-process communication, deadlock processing method, non-contiguous memory management and protection mechanism, page replacement algorithm, file structure, file access method, SPOOLing technology, access control based on permission bits.

Recommended Textbooks/References:

2.   Abraham Silberschatz, Peter Bear Galvin, Greg Gagne, Operating system concepts（Ninth Edition）, Machinery Industry Press, July 2018.

3.   Fei XiangLin, Lou Bin, Operating system Tutorial（Fifth Edition）, Higher Education Press, February 2014.

4.   Tang XiaoDan, Liang HongBing, Zhe FengPing, Tang ZiYing, Computer operating system, Xi'an University Press, May 2014.

5.   Shi Wengchang. Information System Security Introduction (second Edition), Electronics Industry press, February 2014.

0004864 密码学 I

课程编码：0004864

课程名称：密码学 I

英文名称：Cryptography

课程类型：学科基础必修课

学分： 2.5　　**总学时：** 40

面向对象：信息安全（实验班）专业本科生

先修课程：信息安全数学基础

考核形式：平时成绩+考试

撰写人：周艺华

课程简介：（250-300 字）

　　密码学是信息学部为信息安全专业本科生开设的学科基础必修课课程。旨在使学生理解并掌握密码学所涉及的基本理论和方法，具备密码学的基本能力。通过对本课程的学习，要求学生对密码学所涉及的基本理论和方法有比较深入的理解，熟悉和掌握主要的密码学方法与技术。通过配套的实验课程教学，使学生掌握密码学的基本实践能力。本课程的教学内容重点包括：古典密码、序列密码、分组密码体制、公钥密码体制、数字签名、消息认证、杂凑函数、密码协议的基本概念、基本理论以及基本应用；教学难点包括：领会分组密码、公钥密码、数字签名设计与分析的基本思想与方法，培养学生在实践中解决问题的能力。通过本课程的学习，使学生对密码学一个比较全面和系统的了解，掌握密码学的基本概念、理论、技术与方法，为培养解决复杂信息安全工程问题的能力奠定坚实的理论基础。

推荐教材或主要参考书：

[1] 杨波编著，现代密码学（第 5 版），清华大学出版社，2022 年 7 月

[2] 张仕斌，万武南，张金全，应用密码学，西安电子科技大学出版社，2017 年 1 月

[3] 张焕国，唐明编著，密码学引论（第 3 版），武汉大学出版社，2015 年 7 月

[4] 胡向东，魏琴芳，胡蓉编著，应用密码学（第 4 版），电子工业出版社，2019 年 6 月

0004864 Cryptography

Course Number: 0004864

Course Title: Cryptography I

Course Type: Discipline Requirements

Credit: 2.5   **Total Credit Hours:** 40

Students: Undergraduate students majoring in Information Security

Prerequisites: Mathematical basis for information security

Evaluation Method: Course participation + written exams

Writer： Yihua Zhou

Course Description:

Cryptography is one of the compulsory courses for undergraduate students Major in Information Security. Intended to enable students to understand and master the basic theories and methods involved in cryptography, and possess the basic abilities of cryptography. Through the study of this course, students are required to have a deep understanding of the basic theories and methods involved in cryptography, and to be familiar with and master the main cryptographic methods and technologies. Through the supporting experimental courses, students can master the basic practical skills of cryptography. The teaching contents are mainly covered by the following aspects: classical cryptography, sequence cryptography, block cryptography, public key cryptography, digital signature, message authentication, hash function and cryptography protocol etc. The difficulties of teaching contents are described as followings: Understand the basic ideas and methods of block cipher, public key cipher, key management, digital signature design and analysis, and cultivate students 'ability to solve problems in practice. Through study of this course, the students can have a more comprehensive and systematic understanding of cryptography, master the basic concepts, theories, techniques and methods of cryptography, and lay a solid theoretical foundation for the cultivation of the ability to solve the problems of complex information security engineering.

Recommended Textbooks/References:

1.Yang Bo,Modern, Cryptography (4th Edition), Tsinghua University Press, July 2022

2.Zhang Shibin, Wan Wunan, Zhang Jinquan, Applied Cryptography, Xi'an University of Electronic Science and Technology Press, January 2017

3.Zhang Huanguo,Tang Ming, Introduction to Cryptography (3rd Edition), Wuhan University Press, July 2015

4.Hu Xiangdong, Wei Qinfang, Hu Rong, Applied Cryptography (4th Edition), Electronic Industry Press, June 2019

0004850 安全协议

课程编码：0004850

课程名称：安全协议

英文名称：Network Security Protocols

课程类型：学科基础必修课

学分： 2.0　　**总学时：** 32

面向对象：信息安全（实验班）专业本科生

先修课程：计算机网络（双语）

考核形式：平时成绩+实验成绩+考试

撰写人：赖英旭

课程简介：（250-300 字）

　　安全协议是信息学部计算机学院为信息安全专业本科生开设的学科基础课程类型。本课程的目标是除要求学生掌握网络协议漏洞的相关基本概念、理论外，还有网络协议安全性增强的典型思路和方法，提升网络安全防护水平，增强系统能力，体验网络攻防的乐趣。本课程的任务对数据链路层安全协议、网络层安全协议、传输层安全协议、会话层安全协议和应用层安全协议等方面进行了比较深入的分析，介绍各层协议的安全缺陷、易受到的攻击、以及在相应层协议中所增强的安全机制。在网络安全协议应用方面，重点阐述了三种常见的VPN 网络应用模式，并比较详细地介绍了 VPN 网络的工作原理和配置。教学内容重点：数据链路层安全协议、网络层安全协议、传输层安全协议、应用层安全协议。教学内容的难点：安全协议的应用场景，VPN 构建技术。

推荐教材或主要参考书：

[1] 赖英旭，杨震，刘静，网络安全协议，清华大学出版社，2012 年 10 月

[2] 寇晓蕤，王清贤，网络安全协议：原理、结构与应用（第 2 版），高等教育出版社，2016 年 3 月

[3] 肖美华，安全协议形式化分析与验证，科学出版社，2019 年 11 月

[4] 刘天华，朱宏峰，安全协议模型与设计，科学出版社，2018 年 6 月

0004850 Network Security Protocols

Course Number: 0004850

Course Title: Network Security Protocols

Course Type: Discipline Requirements

Credit: 2.0   **Total Credit Hours:**32

Students: Undergraduate students majoring in Information Security

Prerequisites: Computer Network

Evaluation Method: Course participation + Experiment participation + written exams

Writer： Yingxu Lai

Course Description:

Network Security Protocols is one of the basic courses for undergraduate students Major in Information Security. The students are expected to understand the basic concepts, theories, methods, and techniques of Network Security Protocols. The main target of this course is to clarify principle of security mechanism of network protocol. This course is focus on data link layer security protocol, network layer security protocol, transport layer security protocol, session layer security protocol and application layer security protocol. The teaching contents are mainly covered by the following aspects: 3 common VPN(Virtual Private Network) application patterns and the working principle and setup process of VPN. The difficulties of teaching contents are described as followings: application scenarios for security protocols and how to build a VPN network.

Recommended Textbooks/References:

1. Lai Yingxu, Yang Zhen, LiuJing. Network security protocol. Tshing University Press, 2012.10

2. Kou Xiaorui, Wang Qingxian. Network security protocol: Principle, structure and application (Version 2). Higher Education Press, 2016.3

3. Xiao Meihua. Formal analysis and validation of security protocols. Science Press, 2019.11

4. Liu Tianhua, Zhu Hongfeng. Security protocol model and design. Science Press, 2018.6

0008210 网络攻击与防护

课程编码： 0008210

课程名称： 网络攻击与防护

英文名称： Network Attack and Protection

课程类型： 学科基础必修课

学分： 2.0　　**总学时：** 32

面向对象： 信息安全（实验班）本科生

先修课程： 计算机网络（双语）、计算机组成原理

考核形式： 平时成绩+考试

撰写人： 杨震

课程简介：

《网络攻击与防护》课程是面向信息安全专业开设的一门必修课程，共 32 学时。

信息时代，网络空间已成为陆、海、空、天之外人类活动的"第五空间"。政治、经济、文化、社会、军事等国家重要领域的基础设施与网络空间联系日益紧密，网络安全对国家安全牵一发而动全身，已成为国家安全体系的重要组成部分。要贯彻"总体国家安全观"，维护好网络空间这一非传统领域的安全，最关键的要素在于人。目前网络空间安全专业人才的缺口明显，特别是缺乏具有实际动手能力的实践型人才。

本课程以实践型教学为主要特色，面向信息安全专业高年级本科生开设。在学生掌握信息安全基本理论知识的基础上，以实践教学为抓手，培养具有实际动手能力的实践型人才。让学生能够了解网络中存在的常见安全威胁与攻击手段，学习和掌握网络防御技术的基本概念、理论与方法，学习和掌握网络异常的发现、响应与恢复方法。为学生从事网络安全、网络管理、信息保障等工作奠定基础。

本课程依据学生的特点，以总体结构为主线，选择网络安全态势分析、网络安全威胁解析、网络攻击防范实践作为主要内容，讨论网络攻击与防护相关的方法和原理。

推荐教材或主要参考书：

[1]赖英旭，刘思宇，杨震，刘静，叶超等（编著）．计算机病毒与防范技术(第 2 版)．北京：清华大学出版社，2019 年 12 月

[2]牛少彰，崔宝江，李剑（编著）．信息安全概论(第 3 版)，　北京：北京邮电大学出版社，2016 年 08 月

0008210 Network Attack and Protection

Course Number：0008210

Course Title：Network Attack and Protection

Course Type： Compulsory course

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in information security

Prerequisites: Computer network, Computer organization and architecture

Evaluation Method: Course participation + written exams

Writer：Zhen Yang

Course Description:

The course "Network Attack and Protection", is a compulsory course of 32 class hours for information security majors.

Cyberspace now has become the "fifth space" for human activities beyond land, sea, air and sky. Infrastructure in important areas of the country such as politics, economy, culture, society, and the military is becoming increasingly closely linked to cyberspace. Cyber security, with its direct impact on national security, has become an important part of the national security system. To ensure implementation of "General National Security system" and maintenance of security in the non-traditional field of cyberspace, professional talents are the key. At present, specialist in cyberspace security is in great demand,especially those with practical skills.

The course is aimed in cultivating in learners' practical capacity based on their' grasp of the basic theoretical knowledge of information security. It is characterized by its strength in practice-oriented instruction for undergraduates majoring in information security in their third or fourth year. In this course, methods and principles related to network attack and protection will be explored based on such main topics as   network security situation analysis, network security threat analysis, and network attack prevention practice. At the end of this course, learners are expected to be able to understand the common security threats and attack methods in the network; master the basic concepts, theories and methods of network defense technology; identify and respond to unusual phenomenon in cyberspace;

Being able to do what is mentioned above will well prepare students for their future job in network security, network management and information insurance etc.

Recommended Textbooks/References:

1．Lai Yingxu, Liu Shiyu, Yang Zhen, Liu Jing, Ye Chao, et al. (ed.).Computer Virus Research and Defense (second edition). Beijing: Tsinghua University Press，December 2019.

2．Niu Shaozhang, Cui Baojiang, Li Jian (ed.). Information security conspectus (Third edition), Beijing: Beijing University of Posts and Telecommunications Press, October 2016.

0010652 数据库原理及安全

课程编码：0010652

课程名称：数据库原理及安全

英文名称：Database Principles and Security

课程类型：学科基础必修课

学分：2.0　　**总学时：**32

面向对象：信息安全（实验班）专业本科生

先修课程：离散数学，数据结构与算法，网络空间安全导论，操作系统原理及安全

考核形式：平时成绩+考试

撰写人：李铮

课程简介：

　　数据库原理及安全是信息学部为信息安全专业本科生开设的学科基础必修课。随着信息技术的不断发展，数据库系统得到了广泛应用，在准确性、效率和安全性等方面也面临更高的设计要求。本课程主要涉及数据库概念、关系数据库和 SQL、关系数据理论、数据库安全、数据库设计和编程。本课程的目标是通过关系代数、范式理论的教学，训练学生的逻辑思维能力；通过数据库建模的教学，培养学生抽象与归纳的能力；通过查询方法的介绍，增强学生思维的灵活性；通过 SQL 语言、事务处理的教学，培养学生的工程思维以及软件应用与开发能力；通过数据库安全需求与应用措施的教学，培养学生设计方案保障应用安全的能力。

推荐教材或主要参考书：

[1] 王珊，杜小勇，陈红，数据库系统概论（第 6 版），高等教育出版社，2023 年 3 月

[2] 陈越，寇红召，费晓飞，卢贤玲. 数据库安全，国防工业出版社，2015 年 1 月

[3] 邝劲筠，杜金莲，数据库原理实践 (SQL Server 2012)，清华大学出版社，2015 年 7 月

[4] 刘晖，彭智勇等，数据库安全，武汉大学出版社，2007 年 10 月

[5] Jeffrey D. Ullman，Jennifer Widom，数据库系统基础教程（原书第 3 版），岳丽华，金培权，万寿红等译，机械工业出版社，2009 年 8 月

0010652 Database Principles and Security

Course Number: 0010652

Course Title: Database Principles and Security

Course Type: Discipline Requirements

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in Information Security

Prerequisites: Discrete Mathematics, Data Structures and Algorithms, Introduction to Cyberspace Security, Operating System Principles and Security

Evaluation Method: Course participation + written exams

Writer： Zheng Li

Course Description:

The Database principles and security is one of the compulsory courses offered by the Faculty of Information Technology for undergraduate students Major in Information Security. With the continuous development of information technology, database systems have been widely used, and face higher design requirements in terms of accuracy, efficiency and security. This course mainly involves database concept, relational database and SQL, relational data theory, database security, database design and programming. The targets of this course include the following aspects: to train the students' logical thinking ability through the teaching of relational algebra and relational data theory; to cultivate students' ability of abstraction and induction through the teaching of database modeling; to enhance the flexibility of students' thinking through the introduction of query methods; to cultivate students' ability of engineering thinking and software application and development through the teaching of SQL language and transaction processing; to cultivate students' ability to design schemes to ensure application security through the teaching of database security requirements and application measures.

Recommended Textbooks/References:

1. Shan Wang, Shixuan Sa, Introduction to Database Systems (Sixth Edition). *Higher Education Press*, 03-2023

2. Yue Chen, Hongzhao Kou, Xiaofei Fei, Xianling Lu, Database Security. *National Defence Industry Press*, 01-2015

3. Jinyun Kuang, Jinliang Du, Database Principles Practices (SQL Server 2012). *Tsinghua University Press*, 07-2015

4. Hui Liu, Zhiyong Peng et al, Database Security, *Wuhan University Press*, 10-2007

5. Jeffrey D. Ullman, Jennifer Widom, A First Course in DatabaseSystem (Third Edition) translated by Lihua Yue, Peiquan Jin, Shouhong Wan et al. *China Machine Press*, 08-2009.

0010706 信息系统安全

课程编码：0010706

课程名称：信息系统安全

英文名称：Information System Security

课程类型：学科基础必修课

学分： 2.0　　**总学时：** 32

面向对象：信息安全（实验班）专业本科生

先修课程：计算机网络（双语），密码学Ⅰ

考核形式： 平时成绩+考试

撰写人：张建标

课程简介：（250-300字）

　　信息系统安全是信息学部计算机学院为信息安全专业本科生开设的学科基础必修课程。本课程的任务是围绕如何构建一个安全的信息系统，从信息系统安全体系出发，选择安全体系结构的规划与设计、各个层次需要采用的关键技术和产品、信息系统的安全管理和安全评估为主要内容，系统地讲述如何解决信息技术应用所带来的信息安全问题。教学内容重点：信息系统安全概念、网络安全设备原理、安全相关的基本概念（脆弱性、威胁、攻击、安全风险、安全措施）、访问控制模型、可信计算相关标准、网络安全等级保护设计要求。教学内容的难点：信息系统安全体系、安全需求、设计目标和原则、安全模型、可信根等。

推荐教材或主要参考书：

[1] 张建标 编著．网络安全体系结构．北京：科学出版社．2020年待出版

[2] 张建标等 编著．信息安全体系结构．北京：北京工业大学出版社．2011.9

[3] 中华人民共和国国家标准(GB/T 22239-2019)．信息安全技术 网络安全等级保护基本要求．国家市场监督管理总局/中国国家标准化管理委员会发布.2019.5.10

[4] 中华人民共和国国家标准(GB/T 25070-2019)．信息安全技术 网络安全等级保护安全设计技术要求．国家市场监督管理总局/中国国家标准化管理委员会发布.2019.5.10

0010706 Information System Security

Course Number: 0010706

Course Title: Information System Security

Course Type: Core Course

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in information security

Prerequisites: Computer Network, Cryptography I

Evaluation Method: Course participation + written exams

Writer: Jianbiao Zhang

Course Description:

Information System Security is one of the core courses for undergraduate students Major in information security. The main target of this course is about how to build a secure information system, based on the information system security architecture, choose secure architecture planning and design, adopt the key technologies and products, the information system of secure management and secure evaluation, systematically on how to solve the information security problem brought by the information technology application. The teaching contents are mainly covered by the following aspects: information system security concept, network security equipment principle, security-related basic concepts (vulnerability, threat, attack, security risk, security measures), access control model, trusted computing standards, network security level protection design requirements. The difficulties of teaching contents are described as followings: information system security architecture, security requirements, design objectives and principles, security model, trusted root, etc.

Recommended Textbooks/References:

1．Jianbiao Zhang. Network Security Architecture. Beijing: Science Press. To be published in 2020

2．Jianbiao Zhang, et al. Information Security Architecture. Beijing: Beijing university of technology press. 2011.9

3．National Standard of the People's Republic of China (GB/T 22239-2019). Information Security Technology – Baseline for Classified Protection of Cybersecurity

4．National Standard of the People's Republic of China (GB/T 25070-2019). Information Security Technology–Technical Requirements of Security Design for Classified Protection of Cybersecurity

0008185 数字逻辑实验

课程编码： 0008185

课程名称： 数字逻辑实验

英文名称： Digital Logic Experiment

课程类型： 实践环节必修课

学分： 1.0 **总学时：** 32

面向对象： 计算机科学与技术（实验班）专业、计算机科学与技术专业、信息安全（实验班）专业、物联网工程专业本科生

先修课程： 高级语言程序设计

考核形式： 实验验收+实验报告

课程简介： （250-300 字）

　　数字逻辑实验是信息学部为计算机类本科生开设的实践环节必修课。本课程的任务是巩固和加深数字逻辑课程中学到的理论知识，并能够结合 EDA 软件将理论知识用于实践，从而掌握现代数字逻辑电路的分析、设计和调试方法，具备数字逻辑电路设计的基本能力。教学内容重点：掌握组合逻辑电路和时序逻辑电路的分析和设计方法，了解可编程逻辑器件和现代数字系统的设计方法，掌握使用先进 EDA 工具及硬件描述语言设计数字逻辑电路的方法，培养学生调试电路、排除电路故障，解决实际问题的能力。教学内容的难点：采用自顶向下的方法进行系统结构设计、采用硬件描述语言进行建模和电路设计中的仿真验证过程。

推荐教材或主要参考书：

[1] 《数字逻辑实验指导书》，自编，2019 年 10 月。

[2] 贾熹滨，王秀娟，魏坚华，数字逻辑基础与 Verilog 硬件描述语言，清华大学出版社，2012 年 8 月。

0008185 Digital Logic Experiment

Course Number: 0008185

Course Title: Digital Logic Experiment

Course Type: Compulsory Course in Practice

Credit: 1.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in Computer Science and Technology

Prerequisites: Advanced Language Programming of Computer

Evaluation Method: Experimental acceptance + Experimental report

Course Description:

Digital logic experiment is one of the compulsory courses for undergraduate students Major in Computer Science and Technology. The main target of this course is to clarify how to apply the theoretical knowledge learned in the digital logic course to design digital logic circuits with EDA software, make students to master the analysis, design and debugging methods of modern digital logic circuit. This course is focus on the training of practical ability. The teaching contents are mainly covered by the following aspects: mastering the analysis and design methods of combinational logic circuits and sequential logic circuits, understanding programmable logic devices and the design methods of modern digital systems, mastering the method of designing digital logic circuits with advanced EDA tools and hardware description language, training students how to debug circuits, troubleshoot circuit faults, and solve practical problems. The difficulties of teaching contents are described as followings: adopting a top-down method for system structure design, using hardware description language for modeling, simulation and verification.

Recommended Textbooks/References:

1.Digital Logic Experiment Instruction，self-edited，October 2019。

2.Jia Xibin, Wang Xiujuan, Wei Jianhua，Fundamentals of digital logic and Verilog hardware description language, Tsinghua University Press，August 2012。

0008153 计算机网络实验

课程编码： 0008153

课程名称： 计算机网络实验

英文名称： Computer Networks Experiment

课程类型： 实践环节必修课

学分： 1.0　　**总学时：** 32

面向对象： 信息安全（实验班）本科生

先修课程： 计算机网络（双语）

考核形式： 实验验收+实验报告

撰写人： 庄俊玺

课程简介：

　　计算机网络实验是信息学部为信息安全专业本科生开设的实践环节必修课。本课程的任务是为后续的信息安全课程打下基础，使学生在掌握计算机网络的基本工作原理、基本理论的基础上具备一定的网络工程实践能力。教学内容重点：局域网的构建、企业交换网络的设计与实现、小型安全网络的设计与实现、广域网协议实践。教学内容的难点：对各种网络协议进行设计与实现，增强学生深入理解理论知识的能力；对计算机网络互联的综合设计，培养学生的网络互联工程设计能力；对中小型企业网络的设计与实现，提高学生解决实际网络工程问题的能力。

推荐教材或主要参考书：

[1] 《计算机网络实验指导书》(第 2 版)，自编，2020 年 10 月

[2] Andrew S. Tanenbaum , Davi J. Wetherall 编著.严伟，潘爱民译.计算机网络(第 5 版).清华大学出版社，2012 年 3 月第 1 版，2018 年 11 月第 17 次印刷

0008153 Computer Networks Experiments

Course Number: 0008153

Course Title: Computer Networks Experiment

Course Type: Practical Requirements

Credit: 1.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in Information Security

Prerequisites: Computer Networks

Evaluation Method: Experimental acceptance + Experimental report

Writer: Junxi Zhuang

Course Description:

Computer Networks Experiments is one of the Practical Requirements for undergraduate students Major in information security. The main target of this course is to clarify the principles and theories of computer networks. This course is focus on students' engineering practice abilities. The teaching contents are mainly covered by the following aspects: LAN construction, design and implementation of enterprise switching network, design and implementation of small security network, WAN protocol practice. The difficulties of teaching contents are described as followings: It enables students to understand deeply theoretical knowledge by the design and implementation of network protocols. It enables students to design network interconnection engineering by the comprehensive design of computer network interconnection. It enables students to solve actual network engineering problem by the construction of enterprise networks.

Recommended Textbooks/References:

1. Computer Networks Experiment Instruction，self-edited，October 2020

2. Edited by Andrew S. Tanenbaum, Davi J. wetherall, translated by Yan Wei and pan Aimin, computer network (5th Edition), Tsinghua University Press, 1st edition in March 2012, 17th printing in November 2018

0007375 计算机组成原理课设

课程编码： 0007375

课程名称： 计算机组成原理课设

英文名称： Principles of Computer Organization Project

课程类型： 实践环节必修课

学分： 1.5　　**总学时：** 45

面向对象： 计算机类专业本科生

先修课程： 计算机组成原理

考核形式： 平时成绩+课设任务正确性检查成绩+课程设计报告

撰写人： 朱文军

课程简介：（250-300 字）

　　计算机组成原理课设是信息学部为计算机科学与技术专业、信息安全专业、物联网工程专业本科生开设的一门实践环节必修课。本课程的任务是引导学生在系统级上认识计算机整机体系，理解并掌握计算机各核心组成部件的工作原理，加深对计算机"时空"概念的理解，使学生将理论课上学到的计算机组成的知识融会贯通，同时学习设计、实现及调试计算机整机系统的基本步骤和方法，提高分析问题和解决问题的能力，为提高学生的计算机硬件动手实践能力打下坚实的基础。教学内容重点：在 EDA 平台以及硬件实验箱上进行一台简单 MIPS 体系架构模型机的设计、封装和调试。教学内容的难点：模型机的设计和调试。

推荐教材或主要参考书：

[美] 戴维·A. 帕特森（David A. Patterson），约翰·L. 亨尼斯(John L. Hennessy)，计算机组成与设计：硬件、软件接口（英文版-原书第 4 版），机械工业出版社，2012 年 1 月

0007375 Principles of Computer Organization Project

Course Number: 0007375

Course Title: Principles of Computer Organization Project

Course Type: Practical compulsory course

Credit: 1.5   **Total Credit Hours:** 45

Students: Undergraduate students majoring in Computer Science and Technology, Information Security, Internet of things Engineering

Prerequisites: Principles of Computer Organization

Evaluation Method: Course participation + Task correctness check grade + Course design report

Writer： Zhu Wenjun

Course Description:

Principles of computer organization project is one of the practical compulsory courses for undergraduate students Major in computer science and technology, information security and internet of things engineering. The main target of this course is to guide students to know the whole computer system at the system level, understand and master the working principle of each component of the computer. This course is focus on deepening students' understanding of the concept of computer "space and time", enabling them to integrate the knowledge of computer composition learned in theoretical courses, and learn the basic steps and methods of designing, implementing, and debugging computer systems, improve the ability to analyze and solve problems, and lay a solid foundation for improving the students' hands-on computer hardware practical skills. The teaching contents are mainly covered by the following aspects: design, package and debug a simple MIPS architecture model machine on EDA platform and hardware experiment platform. The difficulties of teaching contents are described as followings: design and debugging of a model machine.

Recommended Textbooks/References:

David.A.Patterson,John.L.Hennessy,Computer Organization and Design:The Hardware/Software Interface (Fourth Edition), *China Machine Press*, 01-2012.

0002761 数据结构课设Ⅰ

课程编码：0002761

课程名称：数据结构课设Ⅰ

英文名称：Curriculum Design for Data Structure

课程类型：实践环节必修课

学分： 2.0 **总学时：** 60

面向对象：计算机科学与技术（实验班）专业、计算机科学与技术专业、信息安全（实验班）专业、物联网工程专业本科生

先修课程：高级语言程序设计，数据结构与算法

考核形式：实验验收+课程设计报告

撰写人：苏航

课程简介：

  数据结构课设是信息学部为计算机科学与技术、物联网工程、信息安全专业本科生开设的实践课程类型。本课程是一个综合性的实践教学环节，其目标是让学生运用所学数据结构知识上机解决与实际应用结合紧密的、规模较大的问题。通过分析、设计、编码、调试等各个环节的训练，使学生深刻理解、牢固掌握、综合应用数据结构和算法设计技术，增强分析、解决实际问题的能力，培养项目管理能力和团队合作精神等软件工作者的综合素质。课程设计所设计的题目，在难度和深度方面都大于课内的上机训练，要求最终提交一个具有一定实用价值、界面友好、功能完整、基本可靠的应用程序，从而体现数据结构与算法设计的重要作用。

推荐教材或主要参考书：

[1] 张铭、王腾蛟、赵海燕，数据结构与算法，高等教育出版社，2011 年 1 月。

[2] 严蔚敏、吴为民，数据结构（C 语言版），人民邮电出版社，2017 年 8 月。

[3] 张乃孝、裘宗燕，数据结构—C++与面向对象的途径，高等教育出版社，2003 年 4 月。

[4] Clifford A S. 数据结构与算法（C++）2 版，电子工业出版社，2010 年 1 月。

[5] Michael Main, Data Structures & Other Object Using C++(3Rd Edition)，清华大学出版社，2007 年 1 月。

0002761 Curriculum Design for Data Structure

Course Number: 0002761

Course Title: Curriculum Design for Data Structure

Course Type: Required Courses

Credit: 2.0   **Total Credit Hours:** 60

Students: Undergraduate students majoring in Computer Science and Technology, Internet of Things Engineering, Information Security.

Prerequisites: High-level Language Programming, Data Structures and Algorithms

Evaluation Method: Project realization+Experimental Report

Writer: Hang Su

Course Description:

The Curriculum Design for Data Structure is one of the practice courses for undergraduate students Major in the College of Computer Sciences of Faculty of Information Technology. The design practice for the data structure course is a comprehensive teaching practice process. The main target of this course is to clarify applying students' knowledge within the practical application of the close and the larger problem on the computer. During the training process of analysis, design, coding and debugging, the students can get a deep understanding of the algorithm and they can firmly grasp the comprehensive application of data structure and algorithm design techniques. It can enhance the ability of solve practical problems, and also develop project management capabilities and teamwork spirit.

Arrangements of the subject in curriculum design, it is greater than curricular-on training in terms of difficulty and depth. It is claimed to eventually submit a certain practical, user-friendly, full-featured and basic reliable application. It reflects the important role of the design on the data structures and algorithms.

Recommended Textbooks/References:

1. Zhang Ming,Wang Tengjiao, Zhao Haiyan. Data Structure and Algorithm. Beijing. Higher Education Press. 2011.1.

2. Yan Weimin, Wu Weiming. Data Structure(C). Tsinghua University Press，2017.8.

3. Zhang Naixiao, Qiu Zongyan. Data Structure - C++ and Object-Oriented Approach. Beijing, Higher Education Press. 2003.4.

4. Clifford A S. Data Structure and Algorithm（C++）(2nd Edition). Beijing. Publishing House of Electronics Industry. 2010.1.

5. Michael Main, Data Structures & Other Object Using C++(3rd Edition). Beijing, Tsinghua University Press. 2007.1.

0010694 系统安全综合课程设计Ⅰ

课程编码： 0010694

课程名称： 系统安全综合课程设计Ⅰ

英文名称： Integrated Design on System security

课程类型： 实践环节必修课

学分： 2.0　　**学时：** 60

面向对象： 信息安全（实验班）专业本科生

先修课程： 密码学Ⅰ，计算机组成原理，操作系统原理及安全

考核方法： 平时成绩+线上实训+线上课设

撰写人： 胡俊

课程描述：

　　系统安全综合课程设计是计算机学院为信息安全专业本科生开设的一门实践课程，是北京工业大学信息安全的特色课程。本课程的任务是让学生们分工协作，灵活应用多种信息安全技术，设计、开发和集成综合性安全体系以解决有应用背景的信息系统安全问题，并进行对应的测评工作。本课程巩固学生们对信息安全各方面知识的理解，让学生深入体会信息安全等级保护对系统设计的要求，培养学生们体系化、综合解决安全问题的思维方式以及相互配合、协作开发的意识。

推荐教材和主要参考书：

[1] 胡俊，沈昌祥，公备，《可信计算3.0工程初步（第二版）》，人民邮电出版社，2018年

0010694 Integrated Design on System Security

Course Number: 0010694

Course Title: Integrated Design on System Security

Course Type: Practical Requirements

Credit: 2.0   **Total Credit Hours:**   60

Students: Undergraduate students major in Information Security

Prerequisites: Cryptography, Principles of Computing System, Operating System Theory and Security

Evaluation Method: Course Design

Writer: Jun Hu

Course Description:

Integrated design on system security is a course design for undergraduate students Major in Information Security. It is a characteristic course of information security in Beijing University of technology. The main target of this course is to train students use information security technology to design and implement an integrated secure solution of a system to protect an application environment，during this course design, students should and search other required knowledge, cooperate together to design , develop and integrate a security solution, test and evaluate this solution, and finish the relate documents。.

Recommended Textbooks/References:

1．Hu jun, Shen changxiang, Gong bei, Trusted Computing 3.0 Engineering Fundamentals(The 2nd Version), Post & Telecom *Press*, 12-2018

0008203 网络安全综合课程设计

课程编码： 0008203

课程名称： 网络安全综合课程设计

英文名称： Integrated curriculum design of Network Security

课程类型： 实践环节必修课

学分： 2.0　　**总学时：** 60

面向对象： 信息安全（实验班）专业本科生

先修课程： 计算机网络（双语）

考核形式： 考查

撰写人： 靳晓宁

课程简介：（250-300 字）

　　网络安全综合课程设计是信息学部为信息安全专业本科生开设的实践环节必修课，是一门理论和实践操作强力结合的综合实践课程。引导学生在理论学习的基础上，通过网络安全综合课程设计使学生真正理解和掌握网络安全的相关理论，通过应用所学习的知识，来解决实际网络安全的复杂问题。本课程的任务是学生以工程师的视角，动手操作评估网络系统、计算机操作系统、WEB 应用、网络/IoT/智能设备的安全，这个过程包括采用现有工具或者编写程序对系统的任何弱点、技术缺陷或漏洞的主动分析，挖掘出安全隐患并选用相应的防御方法对其进行修复。通过本课程的实践，学生能针对复杂工程问题自行设计解决方法，提升动手实践能力和科研创新性。教学内容重点：网络渗透项目。教学内容的难点：恶意文件识别软件开发。

推荐教材或主要参考书：

[1]刘静,赖英旭,杨胜志. 网络攻防基础与案例实践. 北京：北京工业大学印刷厂，2021

[2]徐焱,贾晓璐. 内网安全攻防：渗透测试实战指南. 北京：电子工业出版社，2020

[3] Alexander Kott. 网络空间安全防御与态势感知. 北京：机械工业出版社，2019

0008203 Integrated Curriculum Design of Network Security

Course Number: 0008203

Course Title: Integrated Curriculum Design of Network Security

Course Type: Practical Requirements

Credit: 2.0　　　　　　**Total Credit Hours:** 60

Students: Undergraduate students majoring in Information Security

Prerequisites: Introduction to Computer Network

Evaluation Method: Paper

Writer: Xiaoning Jin

Course Description:

Integrated curriculum design of network security is one of the practical requirements courses for undergraduate students Major in information security. Its aim is to enable students to truly understand and master the relevant theories of network security and solve the complex problems of actual network security by applying learned theoretical knowledge. The main target of this course is to clarify initiative analysis of any weaknesses, technical defects or vulnerabilities in the system by using the existing tools or written programs, digging out potential safety hazards, and repairing them with corresponding defense methods. This course is focus on from the perspective of an engineer, students will manually evaluate the security of network systems, computer operating systems, WEB applications, network / IoT / smart devices. As a result, students will be able to design solutions to complex engineering problems on their own, improve hands-on ability and boost scientific research innovation through the practice of this course. The teaching contents are mainly covered by the following aspects: network penetration project. The difficulties of teaching contents are described as followings: malicious file identification software development.

Recommended Textbooks/References:

1.Liu Jing, Lai Yingxu. Introduction to Network Attacks and Defense. Beijing University of Technology printing.2021

2.Xu Yan, Jia Xiaolu. A Practical Guide to Penetration Testing. Publishing House of Electronics Industry.2020

3.Alexander Kott. Cyber Defense and Situational Awareness. China Machine Press.2019

0007366 工作实习

课程编号： 0007366

课程名称： 工作实习

英文名称： Work Practice

课程类型： 实践环节必修课

学分： 4.0　　　　　**学时：** 120

面向对象： 信息安全（实验班）专业本科生

先修课程： 无

考核形式： 平时成绩+答辩成绩

撰写人： 宁振虎

课程简介：（250-300 字）

　　工作实习是按照教育部"新工科"精神和工程教育专业认证的要求设立的长周期专业实习环节。工作实习安排在第 7 学期，为期 8 周。在学生已经掌握了大部分专业知识，有一定的实践能力的情况下，学院与企业共同创建学生工作实习的机会，参与企业研发项目解决一定的实际应用问题，通过工作实习使学生更深入地了解企业文化、熟悉未来可能的工作环境，并培养学生独立解决实际问题的能力和团队协作能力。

　　学院选择国内外的知名信息安全企业，共同建设校外实习基地，通过学生在实际工作中的训练获得对社会的认识，建立团队工作的概念，并通过完成企业的专业任务使自己的专业能力和交流沟通能力得到综合性的锻炼；同时，使学生能够及早地了解社会需求，参加相关技能训练，为他们的就业和创业奠定基础，使学生能够适应科学技术和社会发展的要求。

推荐教材或主要参考书：

　　无

0007366 Work Practice

Course Number: 0007366

Course Title: Work Practice

Course Type: Practical Requirements

Credits: 4.0   **Total Credit Hours**: 120

Students: Information security majors

Prerequisites: None

Evaluation Method: Course participation+ reply grade

Writer: Zhenhu Ning

Course Introduction: (250-300 words)

Work Practice is a long-term professional internship in accordance with the spirit of the "New Engineering" of the Ministry of Education and the requirements of the professional certification of engineering education. Work Practice is scheduled in the 7th semester for 8 weeks. When students have mastered most of the professional knowledge and have certain practical ability, the college and enterprises jointly create opportunities for students. Students participate to solve certain practical application problems, which enable students to understand more deeply Corporate culture, to be familiar with possible future work environments, and to train students to independently solve practical problems and teamwork skills.

The college selects well-known information security companies at home and abroad, and jointly builds off-campus internship bases. Students gain awareness of society through practical training and establish the concept of team work, which improve their professional ability and communication ability by completing professional tasks. At the same time, students can understand social needs early and participate in relevant skills training, which makes a foundation for their employment and entrepreneurship, and enables students to adapt to the requirements of science and technology and social development.

Recommended textbooks/References:

NO

0008184 毕业设计（论文）

课程编号：0008184

课程名称：毕业设计（论文）

英文名称：Graduation Project

课程类型：实践环节必修课

学分：8.0　　　　　　**学时：**480

面向对象：信息安全（实验班）专业本科生

先修课程：无

考核形式： 指导教师评价+评阅人评价+答辩小组评价

撰写人：李铮

课程简介：（250-300 字）

　　毕业设计是按照教育部"新工科"精神和工程教育专业认证的要求设立的长周期专业实习环节。毕业设计安排在第 8 学期，为期 16 周。在学生已经修完全部理论与实践课程，已经掌握信息安全专业的理论基础、专业能力、实践能力的前提下，学生通过选题、资料阅读、选择和使用开发环境和工具、制定研究、设计和开发计划、撰写开题报告、撰写毕业论文（学位论文）、参加答辩等环节，独立完成对问题的分析、求解（含设计和实现）和总结，进一步掌握本专业的基本知识、基本技术和基本方法，综合地、灵活地运用所学基础理论和专业技能解决信息安全学科和专业实际问题，并经历解决复杂工程问题的求解过程，从而得到全面训练，从而培养学生解决复杂问题的能力，为学生的就业和创业奠定基础，适应科学技术和社会发展的要求，支持培养目标的达成。

推荐教材或主要参考书：

　　无

0008184 Graduation Project

Course Number: 0008184

Course Title: Graduation Project

Course Type: Practical Requirements

Credits: 8.0   **Total Credit Hours**: 120

Students: Undergraduate students majoring in Information Security

Prerequisites: None

Evaluation Method: Instructor evaluation + reviewer evaluation + defense group evaluation

Writer: Zheng Li

Course Introduction: (250-300 words)

　　Graduation project is a long-term professional practice link established according to the spirit of "new engineering" of the Ministry of education and the requirements of engineering education professional certification. The graduation project is arranged in the 8th semester for 16 weeks. On the premise that the students have completed all the theoretical and practical courses and mastered the theoretical basis, professional ability and practical ability of information security major, students can complete the course independently through topics selection, data reading, selection and use of development environment and tools, formulation of research, design and development plan, writing of opening report, writing of graduation thesis (Dissertation) and participation in defense Through the analysis, solution (including design and Implementation) and summary of paired problems, further master the basic knowledge, basic technology and basic methods of the major, comprehensively and flexibly use the basic theory and professional skills learned to solve practical problems of information security discipline and specialty, and experience the solution process of solving complex engineering problems, so as to get comprehensive training, so as to train students to solve them The ability of complex problems, which makes a foundation for their employment and entrepreneurship, and enables students to adapt to the requirements of science and technology and social development, support the achievement of training objectives.

Recommended textbooks/References:

　　NO

0008204 固件原理课设

课程编码：0008204

课程名称：固件原理课设

英文名称：Practice on Principle of Firmware

课程类型：专业选修课

学分： 2.0 　　**总学时：** 60

面向对象：信息安全（实验班）本科生

先修课程：固件原理

考核形式：实验

撰写人：王冠

课程简介：（250-300 字）

　　BIOS 作为计算机上电后的第一部分代码，负责初始化硬件和启动操作系统，在整个计算机系统中起着承上启下的作用，是计算机体系中重要的一环，是信息安全研究中不可绕过的一个部分。本课程的任务是培养学生掌握 UEFI BIOS 开发的基本流程，掌握开发环境的配置，掌握 UEFI BIOS 的总体结构，掌握 UEFI BIOS 定制方法，掌握 UEFI BIOS 上驱动和应用的开发方法。通过完成实验，学生可以在板级更深入地理解计算机工作机制，对 UEFI BIOS 整体结构有全面了解，基本具备 UEFI BIOS 开发能力。课程包括 4 个实验：开发基础，驱动开发，RAM Disk 开发，Secure USB disk 开发。

推荐教材或主要参考书：（含主编，教材名，出版社，出版日期）

[1]Vincent Zimmer.Beyond. BIOS: Developing with the Unified Extensible firmware(second edition).Intel press,2010

[2]戴正华.UEFI 原理与编程.机械工业出版社，2016.1

[3]Unified Extensible Firmware Interface Specification.2023.5

0008204 Practice on Principle of Firmware

Course Number: 0008204

Course Title: Practice on Principle of Firmware

Course Type: Practical Electives

Credit: 2.0   **Total Credit Hours:** 60

Students: Undergraduate students majoring in Information Security

Prerequisites: Principle of Firmware

Evaluation Method: Course participation + Experiment

Writer: Guan Wang

Course Description:

Being the first software carried out by computer system at post stage, the firmware BIOS is responsible for initializing the hardware and booting the operating system. Therefore the BIOS is considered as a very important part of computer system and indispensable to research on information security. The main target of this course is to train the student to grasp the basic process of developing UEFI BIOS, configuring method of developing environment, the whole structure of UEFI BIOS, customizing method of UEFI BIOS, and developing method of EFI driver and application. Through the experiment, the students can understand the working mechanism of computer on mainboard level, find out the whole concepts of firmware, and acquire the ability of developing UEFI BIOS. The course includes 4 experiments: the basis of development, the developing of driver, the developing of RAM Disk and the developing of Secure USB disk.

Recommended Textbooks/References:

1.Vincent Zimmer. Beyond BIOS: Developing with the Unified Extensible firmware(second edition).Intel press.2010

2.Zhenghua D.. UEFI: Principles and Programming. China Machine Press，2016.1

3.Unified Extensible Firmware Interface Specification,2023.5

0004851 安全协议课设

课程编码： 0004851

课程名称： 安全协议课设

英文名称： Curriculum Design of Security Protocols

课程类型： 实践环节选修课

学分： 2.0 **总学时：** 60

面向对象： 信息安全（实验班）专业本科生

先修课程： 计算机网络（双语），安全协议

考核形式： 考查

撰写人： 陈渝文

课程简介：（250-300字）

安全协议课设是信息学部为信息安全专业本科生开设的实践环节选修课。是完成《安全协议》课程之后一次全面的综合练习。本课程的主要目的是配合安全协议课程在课堂上所讲授的内容，进行相应的网络安全协议验证和设计操作。本课程的任务是通过对经典安全协议的设计与安全性分析，使学生掌握网络安全原理和技术在实践中的应用。学生在理论学习的基础上，通过应用所学习的知识，来解决一些实际网络安全应用问题。在此基础上，真正理解和掌握网络安全的相关理论，具备程序设计的能力。教学内容重点：网络安全协议验证和设计操作。教学内容的难点：网络安全协议设计。

推荐教材或主要参考书：

[1]赖英旭 田果 刘静. 网络安全协议分析与案例实践. 北京：清华大学出版社，2016

[2]赖英旭 杨震 刘静. 网络安全协议. 北京：清华大学出版社，2012

[3]Jazib Frahim, Omar Santos, Andrew Ossipov. Cisco ASA 设备使用指南（第3版）. 北京：人民邮电出版社，2016

0004851 Curriculum Design of Security Protocols

Course Number: 0004851

Course Title: Curriculum Design of Security Protocols

Course Type: Practical Electives

Credit: 2   **Total Credit Hours:** 60

Students: Undergraduate students majoring in information security

Prerequisites: Introduction to Computer Network, Security Protocols

Evaluation Method: Paper

Writer: Yuwen Chen

Course Description:

Curriculum design of security protocols is one of the practical electives courses for undergraduate students Major in information security. It is a comprehensive exercise after the "Security Protocols" course. The main purpose of this course is to meet teaching content of the "Security Protocols" course, the corresponding network security protocol validation and design operations. The main target of this course is to clarify the design of the classic security protocol and security analysis, students master the principles of network security and technology in practice. Students on the basis of theoretical study, through the application of the knowledge learned to solve some practical problems of network security. This course is focus on the real understanding and master the network security theory, and the ability of programming. The teaching contents are mainly covered by the following aspects: network security protocol validation and design. The difficulties of teaching contents are described as followings: network security protocol design.

Recommended Textbooks/References:

1.Lai Yingxu, Tian Guo, Liu Jing. Network Security Protocol Analysis and Case. Tsinghua University Press.2016

2.Lai Yingxu, Yang Zhen, Liu Jing. Network Security Protocol. Tsinghua University Press.2012

3.Jazib Frahim, Omar Santos, Andrew Ossipov. Cisco ASA All-in-One Next-Generation Firewall (Third Edition). People's post Press.2016

0004750 应用安全课设

课程编码： 0004750

课程名称： 应用安全课设

英文名称： Application Security: Systems and Design

课程类型： 实践环节选修课

学分： 2.0 **总学时：** 60

面向对象： 信息安全（实验班）专业本科生

先修课程： 计算机网络（双语）、网络攻击与防护

考核形式： 平时成绩+考试

撰写人： 杨震

课程简介：

《应用安全课设》课程是面向信息安全专业开设的一门选修课程，共 60 学时。

网络空间安全学科是一个涉及计算机、通信、数学、物理、法律、管理等学科的交叉学科，培养能够从事计算机、通信、电子商务、电子政务、电子金融等领域的网络空间安全高级专门人才。虽然我国的信息化发展速度惊人，但随之而来的网络空间安全问题也日益突出，专业人才的缺口较大，特别是缺乏具有实际动手能力的实践型人才。

本课程以实践型教学为主要特色，面向信息安全专业高年级本科生开设。在学生掌握信息内容安全、数字取证、数据安全与隐私保护、信息隐藏等应用安全基础知识的基础上，以实践教学为抓手，通过设置 60 学时的课程实践环节，培养具有实际动手能力的实践型人才。为学生从事企业应用安全相关工作奠定基础。

本课程依据学生的特点，以总体结构为主线，选择网络信息获取技术、网络信息清洗与索引技术、网络信息隐藏技术、网络信息过滤技术、网络信息推荐技术、网络信息舆情分析技术作为主要内容，讨论应用安全技术相关的方法和原理。除了学习知识外，还要学习自顶向下、自底向上、递归求解、模块化等典型方法；给学生提供参与设计实现颇具规模的复杂系统的机会，培养其工程意识和能力。

推荐教材或主要参考书：

[1] 赖英旭，刘思宇，杨震，刘静，叶超等（编著）. 计算机病毒与防范技术(第 2 版). 北京：清华大学出版社，2019 年 12 月

[2] 张茹，刘建毅（编著）. 数字内容安全. 北京：北京邮电大学出版社，2017 年 10 月

0004750 Application Security: Systems and Design

Course Number: 0004750

Course Title: Application Security: Systems and Design

Course Type: Optional course

Credit: 2 　　　　　**Total Credit Hours:** 60

Students: Undergraduate students majoring in information security

Prerequisites: Computer network, Network attack and protection

Evaluation Method: Course participation + written exams

Writer: Zhen Yang

Course Description:

The course "Applied Security " is an optional one of 60 class hours　for information security majors.

Cyberspace security discipline is an interdisciplinary discipline related to computer, communication, mathematics, physics, law, management and other disciplines. It is aimed at cultivating cyberspace security specialists　who　serve in such fields as computer, communication, e-commerce, e-government, and e-finance. With fast development of IT-application in China comes the increasing challenge for　cyberspace security, resulting in a great demand for network security specialists, especially those with practical skills.

The course is aimed in cultivating in learners' practical capacity based on their' grasp of the basic theoretical knowledge in information content security, digital forensics, data security and privacy protection, information hiding, etc. It is characterized by its strength in practice-oriented instruction over 60 class hours for undergraduates majoring in information security in their third or fourth year.

In this course, learners will explore methods and principles related to the application of security technology base on such topics as network information acquisition technology, network information cleaning and indexing technology, network information hiding technology, network information filtering technology, network information recommendation technology, and network information public opinion analysis technology. In addition, learners will also study typical methods such as top-down, bottom-up, recursive solving, and modularization. Finally learners will be provided with opportunities to participate in the design and implementation of large-scale complex systems for cultivation of their engineering awareness and ability. All of these will pave way for learners' effective involvement in security application in enterprises.

Recommended Textbooks/References:

1. Lai Yingxu, Liu Shiyu, Yang Zhen, Liu Jing, Ye Chao, et al. (ed.).Computer Virus Research and Defense (second edition). Beijing: Tsinghua University Press，December 2019.

2. Zhang Ru, Liu Jianyi (ed.). Information content security, Beijing: Beijing University of Posts and Telecommunications Press, October 2017.

0008187 面向对象程序设计

课程编码： 0008187

课程名称： 面向对象程序设计

英文名称： Object Oriented Programming

课程类型： 专业选修课

学分： 2.5　　**总学时：** 40

面向对象： 计算机科学与技术（实验班）专业、计算机科学与技术专业、信息安全（实验班）专业、物联网工程专业本科生

先修课程： 高级语言程序设计

考核形式： 平时成绩+考试

撰写人： 杨惠荣

课程简介：（250-300字）

　　面向对象程序设计（Object Oriented Programming，OOP）是一种被广泛应用的计算机编程架构，OOP 达到了软件工程的三个主要目标：重用性、灵活性和扩展性。课程通过分析 OOP 的基本思想及 Java 语言的实现机制，讨论 OOP 的方法，培养学生采用面向对象的方法分析和求解问题的能力。要求学生掌握面向对象的基本思想和有关的基本概念、基本方法，掌握基于 OOP 思想的 Java 语言实现机制，掌握 Java 语言的基本语法和 Java 集成开发环境下的编程技术，能够运用 OOP 方法分析和求解一般应用问题。并培养学生的面向对象系统分析、设计能力，提高解决复杂工程问题的能力。

推荐教材或主要参考书：

[1] 叶乃文，王丹，杨惠荣，面向对象程序设计(第 3 版)，清华大学出版社，2013 年 8 月

[2] 邢国波，杨朝晖，郭庆，徐遵义，Java 面向对象程序设计，清华大学出版社，2019 年 6 月

[3] 刘彦君，张仁伟，满志强，Java 面向对象思想与程序设计，人民邮电出版社，2018 年 11 月

0008187 Object Oriented Programming

Course Number: 0008187

Course Title: Object Oriented Programming

Course Type: Major Electives

Credit: 2.5   **Total Credit Hours:** 40

Students: Undergraduate students majoring in Computer Science and Technology

Prerequisites: High-Level Language Programming

Evaluation Method: Course participation + experiment + written exams

Writer： Huirong Yang

Course Description:

Object oriented programming (OOP) is a widely used computer programming architecture. It achieves three main goals of software engineering: reusability, flexibility and expansibility. Our course analyzes the basic idea of OOP and the implementation mechanism of Java language, discusses the methods of OOP and cultivates students' ability to analyze and solve problems with object-oriented method. Students are required to master the basic idea of OO and related basic concepts and methods, to master the implementation mechanism of Java language based on OOP ideas, to master the basic syntax of Java language and the programming technology under the Java integrated development environment. The students should also able to analyze and solve general application problems with OO method. At the same time, students' ability of OOA(Object-Oriented system Analysis) and OOD(Object-Oriented Design) is trained, the ability of solving complex engineering problems is improved.

Recommended Textbooks/References:

1. Ye Naiwen, Wang Dan, Yang Huirong. Object oriented programming (3rd Edition). Tsinghua University Press. August 2013

2. Xing Guobo, Yang Chaohui, Guo Qing, Xu Zunyi. Java object-oriented programming. Tsinghua University Press. June 2019

3. Liu Yanjun, Zhang Renwei, manzhiqiang. Java object-oriented idea and program design. People's Posts and Telecommunications Press. November 2018

0008211 信息论与编码

课程编码： 0008211

课程名称： 信息论与编码

英文名称： Information Theory and Coding Theory

课程类型： 专业选修课

学分： 2.0　**总学时：** 32

面向对象： 信息安全（实验班）专业本科生

先修课程： 概率论与数理统计（工）

考核形式： 平时成绩+考试

撰写人： 姜楠

课程简介：

物质、能量和信息是组成世界的三大要素。信息论与编码要研究的就是信息，它运用概率论与数理统计的方法研究信息、信息熵、通信系统、网络传输、数据表示、数据压缩、密码学等问题，是整个信息学科的基础。通过本课程的学习，使学生对信息理论有一个初步的了解，熟悉用信息论的观点和方法来分析和解决问题的思路，掌握数据编码的基本方法，为从事信息安全的研究和应用打下基础。

推荐教材或主要参考书：

[1] 姜楠，王健. 信息论与编码理论（第2版）. 北京：清华大学出版社，2021年5月

[2] 科尔曼. 信息论基础. 北京：机械工业出版社，2008年1月

[3] 傅祖芸. 信息论：基础理论与应用. 北京：电子工业出版社，2015年2月

[4] 沈世镒，陈鲁生. 信息论与编码理论. 北京：科学出版社，2010年10月

0008211 Information Theory and Coding Theory

Course Number: 0008211

Course Title: Information Theory and Coding Theory

Course Type: Major Electives

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in information security, computer science and Internet of Things

Prerequisites: Probability Theory

Evaluation Method: Course participation + written exams

Writer： Nan Jiang

Course Description:

Matter, energy and information are the three main elements that make up the world. Information theory and coding to be studied is information, it uses probability theory and mathematical statistics to study information, information entropy, communication system, network transmission, data representation, data compression, cryptography and other issues, is the basis of the whole information discipline. Through the study of this course, students have a preliminary understanding of information theory, familiar with the ideas of using information theory to analyze and solve problems, master the basic methods of data coding, and lay a foundation for the research and application of information security.

Recommended Textbooks/References:

1．Jiang Nan, Wang Jian. Information Theory and Coding Theory (The second edition). Beijing: Tsinghua University Press, May 2021

2．Coleman. The basis of information theory. Beijing: Machinery Industry Press, January 2008

3．Fu Zuxuan. Information Theory: Basic Theory and Application. Beijing: Electronic Industry Press, February 2015

4．Shen Shixuan, Chen Lusheng. Information Theory and Coding Theory. Beijing: Science Press, October 2010

0008217 信息内容安全

课程编码： 0008217

课程名称： 信息内容安全

英文名称： Information Content Security

课程类型： 专业选修课

学分： 2.0　　**总学时：** 32

面向对象： 信息安全（实验班）本科生

先修课程： 高等数学（工）、计算机组成原理

考核形式： 平时成绩+考试

撰写人： 马伟

课程简介：（250-300 字）

　　信息内容安全技术对于维护绿色网络空间至关重要。通过本课程的学习，使学生能够对信息内容安全有一个比较全面和系统的理解，充分认识维护绿色网络空间的重要性，掌握信息内容安全的基本概念、原理和关键技术，了解信息内容安全方面的最新研究成果，为今后从事信息内容安全及相关方向的研究和产品研发奠定基础。课程内容涉及：网络媒体信息获取、网络媒体内容特征表达与分析、基于生物特征的身份认证、数字水印与版权保护、信息过滤与舆情监控等信息内容安全相关话题。

推荐教材或主要参考书：

[1] 周学广等编著，信息内容安全，武汉大学出版社，2012 年

[2] 李建华等编著，信息内容安全管理及应用．机械工业出版社，2010 年

[3] 杨黎斌等编著，网络信息内容安全．清华大学出版社，2017 年

0008217 Information Content Security

Course Number: 0008217

Course Title: Information Content Security

Course Type: Major Electives

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in Information Security

Prerequisites: Advanced mathematics, Principles of Computer Organization

Evaluation Method: Course participation + written exams

Writer: Wei Ma

Course Description:

Information content security is essential to maintaining green cyberspace. The objective of this course is to lay foundation for students to be engaged in research and product development in the field of and related fields to information content security, by helping them 1) have a comprehensive and systematic understanding of information content security; 2) understand the importance of maintaining green cyberspace; 3) master the basic concepts, principles and key technologies of information content security; 4) comprehend the latest research outcome in information content security. The contents of this course include data acquisition from Internet, information content representation and analysis, biometric authentication, digital watermarking and copyright protection, information filtering, and public opinion monitoring.

Recommended Textbooks/References:

1．Zhou Xueguang, et al., Information Content Security, *Wuhan University Press*, 2012

2．Li Jianhua, et al., Information Content Security Management and Application, *China Machine Press*, 2010

3．Yang Libin, et al., Cyberspace Information, *Tsinghua University Press*, 2017

0008212 固件原理（双语）

课程编码： 0008212

课程名称： 固件原理（双语）

英文名称： Principle of Firmware

课程类型： 专业选修课

学分： 2.0   **总学时：** 32

面向对象： 信息安全（实验班）本科生

先修课程： 高级语言程序设计

考核形式： 平时成绩+实验

撰写人： 王冠

课程简介：（250-300 字）

  BIOS 作为计算机上电后的第一部分代码，负责初始化硬件和启动操作系统，在整个计算机系统中起着承上启下的作用，是计算机体系中重要的一环，是信息安全研究中不可绕过的一个部分。本课程的任务是培养学生掌握计算机固件的基本概念、基本组成、基于 UEFI 的计算机固件的体系、机制及基本开发方法基本方法，在计算机板级更深入地理解计算机的工作机制，提高系统软件的开发水平，培养学生自主学习的能力，增强学生的竞争力。教学知识点包括：UEFI 的基本概念和组成结构；UEFI 基本架构和驱动模型；PEI（Pre-EFI Initialization）；DXE（Driver Execution Environment）；UEFI 基本的开发方法。

推荐教材或主要参考书：

[1] Vincent Zimmer.Beyond. BIOS: Developing with the Unified Extensible firmware(second edition).Intel press,2010

[2] 戴正华.UEFI 原理与编程.机械工业出版社，2016.1

[3] Unified Extensible Firmware Interface Specification.2023.5

0008212 Principle of Firmware

Course Number: 0008212

Course Title: Principle of Firmware

Course Type: Major Electives

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in Information Security

Prerequisites: Advanced Programming Language

Evaluation Method: Course participation + Experiment

Writer： Guan Wang

Course Description:

Being the first software carried out by computer system at post stage, the firmware BIOS is responsible for initializing the hardware and booting the operating system. Therefore the BIOS is considered as a very important part of computer system and indispensable to research on information security. The main target of this course is to clarify the roles of firmware, architecture of firmware, basic concept of UEFI, architecture of UEFI and the responsibilities of main parts of UEFI. Through the study of the course, the students can understand the working mechanism of computer on mainboard level, find out the whole concepts of firmware, grasp the method of developing BIOS. The basic topics include: the basic concept and architecture of UEFI,UEFI driver model, PEI（Pre-EFI Initialization）,DXE（Driver Execution Environment）, the method of developing UEFI.

Recommended Textbooks/References:

1. Vincent Zimmer. Beyond BIOS: Developing with the Unified Extensible firmware(second edition).Intel press.2010

2. Zhenghua D.. UEFI: Principles and Programming. China Machine Press，2016.1

3. Unified Extensible Firmware Interface Specification,2023.5

0010679 网络协议分析与设计

课程编码：0010679

课程名称：网络协议分析与设计

英文名称：Network Protocol Analysis and Design

课程类型：专业选修课

学分： 2.0 **总学时：** 32

面向对象：信息安全（实验班）本科生

先修课程：计算机网络（双语）

考核形式：考查

撰写人：刘静

课程简介：（250-300 字）

  网络协议分析与设计是信息学部为信息安全专业本科生开设的专业选修课。网络协议即网络中传递、管理信息的一些规范。如同人与人之间相互交流是需要遵循一定的规矩一样，计算机之间的相互通信需要共同遵守一定的规则，这些规则就称为网络协议。网络协议是网络的基础，没有网络协议就没有互联网的发展。各个协议有其实际的应用及安全缺陷，是网络安全方向理论和实践结合最好的课程之一。本课程的任务是结合专业特点和学生特点，讲解主机从接入网络一刻信息被传递到其他网络中，各个层次所涉及的主要网络协议。深入分析主要网络协议的设计思想、流程、其所解决的问题及其面临的安全问题。每个网络协议注重原理、实践和安全隐患三个方面融会贯通。并且讲解如何设计和编写带有安全机制的网络协议，对编写的协议进行测试。教学内容重点：网络协议原理和安全缺陷。教学内容的难点：设计和编写带有安全机制的网络协议。

推荐教材或主要参考书：

[1]刘静 赖英旭. 网络协议分析. 北京：北京工业大学印刷厂，2021

[2]寇晓蕤 蔡延荣 张连成. 网络协议分析（第 2 版）. 北京：机械工业出版社，2018

[3]王晓卉 李亚伟. Wireshark 数据包分析实战详解. 北京：清华大学出版社，2015

[4]刘飚. 网络编程与分层协议设计:基于 Linux 平台实现. 北京：机械工业出版社，2011

0010679 Network Protocol Analysis and Design

Course Number: 0010679

Course Title: Network Protocol Analysis and Design

Course Type: Major Electives

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in information security

Prerequisites: Introduction to Computer Network

Evaluation Method: Paper

Writer: Jing Liu

Course Description:

Network protocol analysis and design is one of the major electives courses for undergraduate students Major in information security. As communication between people is necessary to follow certain rules, the mutual communication between computers need to comply with certain rules, these rules are called network protocols. Network protocol is the basis of the network, the development of the network relies on network protocols. Each protocol has its practical application and security flaw. This course is one of the best courses in network security theory and practice. The main target of this course is to clarify the major network protocols involved at each layer. Depth analysis of the design of major network protocols, processes, the problems they are facing and the security issues facing. This course is focus on principles, practices and security risks of each network protocol. Illustrate how to design and write network protocols with security mechanisms, and test the written protocols. The teaching contents are mainly covered by the following aspects: each network protocol focuses on principles, practices and security risks of three aspects of mastery. The difficulties of teaching contents are described as followings: design and write network protocols with security mechanisms.

Recommended Textbooks/References:

1．Liu Jing, Lai Yingxu. Network Protocol Analysis. Beijing University of Technology printing.2021

2．Kou Xiaorui, Cai Yanrong, Zhang Liancheng. Network Protocol Analysis (2nd Edition). China Machine Press.2018

3．Wang Xiaohui, Li Yawei. Network Packet Analysis with Wireshark. Tsinghua University Press.2015

4．Liu Biao. Network Programming and Layered Protocol Design (Linux Platform). China Machine Press.2011

0008208 安全软件开发

课程编码：0008208

课程名称：安全软件开发

英文名称：Building Security for Developing Software

课程类型：专业选修课

学分： 2.0　　**总学时：** 32

面向对象：信息安全（实验班）专业本科生

先修课程：高级语言程序设计，网络空间安全导论

考核形式：平时成绩+实验

撰写人：王伟茹

课程简介：

　　安全软件开发是信息学部为信息安全专业本科生开设的专业选修课程。本课程的目标是以理论加实践型教学为主要特色，讲述如何将安全开发过程和信息安全专业知识用于解决软件工程实践问题，在掌握软件安全开发基本理论知识的基础上，以实践教学为抓手，介绍在软件开发过程中提高软件安全性的技术、方法和工具，以提高安全开发水平，树立安全开发意识，增强对软件安全威胁的认识，应用技术及工具解决软件安全开发工程实践问题的能力，培养实践型网络安全人才。课程的主要内容包括软件安全、软件安全漏洞概述、管控和相关的法规要求、典型软件安全漏洞分析、软件安全开发模型、软件安全开发生命周期中各个环节涉及的安全技术、方法、规则和工具等。教学内容重点：安全的软件开发过程、方法和工具。教学内容的难点：软件安全漏洞的发现、响应处理和预防。

推荐教材或主要参考书：

[1] 陈波，于泠，软件安全技术，机械工业出版社，2018 年 6 月

[2] 张剑，软件安全开发，电子科技大学出版社，2015 年 02

[3] 任伟，软件安全，国防工业出版社，2010 年 7 月

[4] John Viega, Gary McGraw(著)，殷丽华，张冬艳，郭云川，颜子夜(译)，安全软件开发之道，机械工业出版社，2014 年 3 月

[5] Micheal Howard(著)，李兆星，原浩，张铖(译)，软件安全开发生命周期，电子工业出版社，2008 年 1 月

0008208 Building Security for Developing Software

Course Number: 0008208

Course Title: Building Security for Developing Software

Course Type: Major Elective Course

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in Information Security

Prerequisites: Advanced Language Programming，Introduction to Cyberspace Security

Evaluation Method: Course participation + Experiment

Writer： Weiru WANG

Course Description:

《Building Security for Developing Software》 is one of the major elective courses for undergraduate students Major in Information Security. The main target of this course is to clarify how to apply the software security development process and information security technology to solve the practical problems of software engineering. In order to improve the level of security development, establish the awareness of security development, enhance the understanding of software security threats, the ability to apply technology and tools to solve practical problems, and train practical network security talents, this course is focus on the technology, methods and tools to improve software security between the software development process by practical teaching. The teaching contents are mainly covered by the following aspects: software security, overview of software security vulnerability, control and related regulatory requirements, analysis of typical software security vulnerabilities, software security development models, security technologies, methods, and tools involved in all aspects of the software security development life cycle etc. The difficulty of teaching contents are the discovery, response and prevention of software security vulnerability.

Recommended Textbooks/References:

1. Chen Bo, Yu Ling, Software Security Technology, China Machine Press，06-2018

2. Zhang Jian, Software Security Development, University of Electronic Science and Technology Press，02-2015

3. Ren Wei, Software Security, National Defense Industry Press，07-2010

4. John Viega , Gary McGraw, Building Secure Software, Addison-Wesley，2008

5. Michael Howard et al, The Security Development Lifecycle, Publishing House of Electronics Industry，01-2008

0004886 信息安全法律基础Ⅰ

课程编码：0004886

课程名称：信息安全法律基础Ⅰ

英文名称：Law Fundamentals about Information Security

课程类型：专业选修课

学分： 2.0 **总学时：** 32

面向对象：信息安全（实验班）专业、计算机科学与技术专业、物联网工程专业及全校其它专业本科生

先修课程：思想道德修养与法律基础

考核形式：平时成绩+考试

撰写人：杨宇光

课程简介：（250-300 字）

　　信息网络的发展，需要强有力的法律保障；信息网络的相关法制建设，又是信息网络及其安全技术发展的规范和依据。要保障信息安全，必须从技术和法律两个方面寻求对策。因此，信息安全法对于保障信息安全、惩治信息犯罪具有重要的作用。本课程的课程目标是通过对信息安全相关法律条款和经典案例的介绍向学生传授信息安全相关法律知识，使学生较系统地掌握信息安全相关法律法规，提升学生的信息安全意识和对计算机网络环境和信息安全新形势下涌现的法律领域新问题的分析能力。教学内容包括：犯罪的概念、类型、计算机犯罪、国家安全法、网络安全法、保密法、密码法、域名权、隐私权、个人信息保护法、电子证据、计算机软件保护条例、信息网络传播权保护条例、电子签名法、电子商务法、人工智能法律规制等相关法律法规。

推荐教材或主要参考书：

[1] 陈忠文、麦永浩．信息安全标准与法律法规（第三版）．武汉大学出版社．2017.9.1

[2] 夏冰．网络安全法和网络安全等级保护 2.0．电子工业出版社．2017.01

[3] 黄波，刘洋洋，李锦．信息安全法律法规汇编与案例分析(公安院校招录培养体制改革试点专业系列教材)．清华大学出版社．2012.

[4] 中华人民共和国保密法律法规汇编（第二版）．法律出版社．2019.07.

0004886 Law Fundamentals about Information Security I

Course Number: 0004886

Course Title: Law Fundamentals about Information Security

Course Type: Major Electives

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students of all majors in BJUT

Prerequisites: Thought Morals Tutelage and Legal Foundation

Evaluation Method: Course participation + written exams

Writer：Yuguang Yang

Course Description:

The development of information networks requires strong legal protection. The legal construction related to information networks is also the basis for the development of information networks and their security technologies. To ensure information security, countermeasures must be sought from both technical and legal perspectives. Therefore, the Information Security Law plays an important role in ensuring information security and punishing information crimes. The course objective of this course is to impart legal knowledge related to information security to students through the introduction of legal provisions and classic cases related to information security, so that students can systematically grasp the laws and regulations related to information security, enhance their information security awareness, and analyze new legal issues emerging in the computer network environment. The teaching contents are mainly covered by the following aspects: the concept and types of crime, computer crime, national security law, network security law, confidentiality law, cryptography law, domain name right, privacy right, personal information protection law, electronic evidence, computer software protection regulations, information network dissemination rights protection regulations, electronic signature law, e-commerce law, artificial intelligence legal regulations, and other relevant laws and regulations.

Recommended Textbooks/References:

1. Zhong-Wen Chen, Yong-Hao Mai. Standards and Law about Information Security (Third Edition). Wuhan: Wuhan University Press. 2017.9.1.

2. Bing Xia. Cybersecurity Law and Cybersecurity Level Protection 2.0. Electronic Industry Press. 2017.01.

3. Huang Bo, Bo Huang, Yang-Yang Liu, Jin Li. Information Security Law and Case Study. Qinghua University Press. 2012.

4. Compilation of confidential laws and regulations of the People's Republic of China (Second Edition). Law Press. 2019.07.

0004923 信息隐藏

课程编码： 0004923

课程名称： 信息隐藏

英文名称： Information Hiding

课程类型： 专业选修课

学分： 2.0　　**总学时：** 32

面向对象： 信息安全（实验班）专业本科生

先修课程： 无

考核形式： 实验+平时成绩+考试

撰写人： 姜楠

课程简介：

　　信息隐藏技术是一种重要的信息安全技术，本课程以图像信息隐藏为主，介绍载体的基本知识、隐写术、数字水印、信息隐藏的应用（版权保护、图像的篡改与防伪鉴别等）等内容。通过本课程的学习，使学生对信息隐藏有一个基本的了解，掌握信息隐藏的基本概念和方法，为从事信息隐藏的研究和应用打下一个坚实的基础。

推荐教材或主要参考书：

[1] 陆哲明，聂廷远，吉爱国. 信息隐藏概论. 北京：电子工业出版社，2014 年 11 月

[2] 张立和. 透视信息隐藏. 北京：国防工业出版社，2007 年 2 月

[3] 葛秀慧. 信息隐藏原理及应用. 北京：清华大学出版社，2009 年 10 月

[4] 王丽娜，张焕国. 信息隐藏技术与应用. 武汉：武汉大学出版社，2003 年 8 月

0004923 Information Hiding

Course Number: 0004923

Course Title: Information Hiding

Course Type: Major Electives

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in information security, computer science and Internet of Things

Prerequisites: None

Evaluation Method: Experiment+Course participation + written exams

Writer: Nan Jiang

Course Description:

Information hiding technology is an important information security technology, this course mainly to image information hiding, introducing the basic knowledge of the carrier, cryptography, digital watermarking, information hiding applications (copyright protection, image tampering and anti-counterfeiting identification, etc.). Through the study of this course, students have a basic understanding of information hiding, master the basic concepts and methods of information hiding, and lay a solid foundation for the research and application of information hiding.

Recommended Textbooks/References:

1. Lu Zheming, Yu Tingyuan, Ji patriotic. An overview of information hiding. Beijing: Electronic Industry Press, November 2014

2. Zhang Lihe. Perspective information is hidden. Beijing: National Defense Industry Press, February 2007

3. Ge Xiuhui. Information hiding principle and application. Beijing: Tsinghua University Press, October 2009

4. Wang Lina, Zhang Huanguo. Information hiding technology and application. Wuhan University Press, August 2003

0010146 深度网络及 AI 技术安全

课程编码：0010146

课程名称：深度网络及 AI 技术安全

英文名称：Security of deep neutral network and AI technology

课程类型：专业选修课

学分： 2.0 **总学时：** 32

面向对象：信息安全（实验班）专业本科生

先修课程：网络攻击与防护

考核形式：平时成绩+考察

撰写人：陈渝文

课程简介：（250-300 字）

    深度网络及 AI 技术安全是计算机学院为信息安全专业本科生开设的专业选修课程类型。本课程的任务是对神经网络中的数据隐私和数据安全进行了分析。主要介绍了基于同态加密的神经网络，能够让服务器在不知道用户原始数据的情况下，对密文进行挖掘，从而得到一个基于密文的结果。首先介绍常用的同态加密方法，然后再介绍基于同态加密的神经网络。教学内容重点：同态加密的原理，神经网络的基础知识，CryptoNets 的层次结构，CryptoNets 使用的同态加密方法，Faster CryptoNets、HCNN 两种基于 CryptoNets 的神经网络。教学内容的难点：同态加密算法的实现，神经网络的训练流程，在数据集上测试基于同态加密的神经网络，CryptoDL 技术。

推荐教材或主要参考书：

[1] 周志华，机器学习，清华大学出版社，2016 年 1 月

[2] 伊恩·古德费洛（Ian Goodfellow），深度学习，人民邮电出版社，2017 年 8 月

[3] 弗朗索瓦·肖莱（Francois Chollet），Python 深度学习，人民邮电出版社，2018 年 8 月

[4] 安德鲁·特拉斯克（Andrew W. Trask）著，王晓雷、严烈译，深度学习图解，清华大学出版社，2019 年 12 月

[5] Aurélien Gér 著，Scikit-Learn 与 TensorFlow 机器学习实用指南，东南大学出版社，2017 年 1 月

0010146 Security of deep neutral network and AI technology

Course Number: 0010146

Course Title: Security of deep neutral network and AI technology

Course Type: Subject Elective

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in Computer and Information Security

Prerequisites: Network Attack and Protection

Evaluation Method: Course participation + paper

Writer： Yuwen Chen

Course Description:

Security of deep neutral network and AI technology is one of the subject elective courses for undergraduate students Major in computer and information security. The main target of this course is to clarify data security and data privacy in neural network. This course is focus on homomorphic based neural network, a sever conduct data mining technology on the ciphertext, and will get results based on ciphertext. First, some homomorphic encryption method is discussed, second, some homomorphic based neural network is discussed. The teaching contents are mainly covered by the following aspects: the principle of homomorphic encryption, foundation knowledge of neural network, the structure of CryptoNets, homomorphic encryption methods used by CryptoNets. The difficulties of teaching contents are described as followings: Implementation of homomorphic encryption, the training process of neural network, testing of the homomorphic encryption on specific data, the CryptoDL technology.

Recommended Textbooks/References:

1.Zhihua Zhou, Machine Learning, *Tsinghua university press*, January-2016

2.Ian Goodfellow, Deep Learning, *Post & Telecom press*, October 2017

3.Francois Chollet, Deep learning with Python, *Post & Telecom press*, October-2018

4.Andrew W. Trask, Grokking Deep Learning, *Tsinghua university press*, December-2019

5.Aurélien Gér, Hands-On Machine Learning with Scikit-Learn & TensorFlow, *Southeast university press*, January-2017

0004863 可信计算基础

课程编码： 0004863

课程名称： 可信计算基础

英文名称： Introduction of Trusted Computing

课程类型： 专业选修课

学分： 2.0   **学时：** 32

面向对象： 信息安全（实验班）专业本科生

先修课程： 密码学Ⅰ，计算机组成原理，操作系统原理与安全

考核方法： 平时成绩+线上实训+线上课设

撰写人： 胡俊

课程描述：

  可信计算基础是计算机学院为信息安全专业本科生开设的一门限选课程，是北京工业大学信息安全的特色课程，其采用线上线下混合式教学方法。本课程的任务是使学生了解安全可信的网络安全观，理解可信计算的基本概念及其对安全的支撑作用，掌握可信计算密码机制和可信支撑安全的工程实践能力，学习通过可信计算改进应用安全机制的方法，以及通过模拟环境验证可信计算对安全支撑作用的能力。让学生了解安全自主自控的重要性，培养学生从实际出发，严谨负责的科学态度。教学内容重点：安全可信网络安全观，可信计算基本概念，可信密码机制，可信对系统安全的支撑，可信计算的应用。教学内容的难点：可信密码机制，可信计算的应用。

推荐教材和主要参考书：

[1] 胡俊，沈昌祥，公备，《可信计算3.0工程初步（第二版）》，人民邮电出版社，2018年

[2] 邹德清，羌卫中，金海 《可信计算技术原理与应用》，科学出版社，2011年

[3] 沈昌祥 《信息安全导论》 电子工业出版社，2009年

[4] 刘克龙 冯登国 石文昌《安全操作系统原理与技术》，科学出版社，2004年

[5] Trusted Computing Group, TCG Software Stack(TSS) Specification Version 1.2 2006.1 http://www.trustedcomputinggroup.org

0004863 Introduction of Trusted Computing

Course Number: 0004863

Course Title: Introduction of Trusted Computing

Course Type: Major Electives

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students major in Information Security

Prerequisites: Cryptography, Principles of Computing System, Operating System Theory and Security

Evaluation Method: Practicum + Online Training +Online Design

Writer： Jun Hu

Course Description:

Introduction of trusted computing is a specialty-limited course for undergraduate students Major in Information Security. It is a characteristic course of information security in Beijing University of technology, adopts online and offline hybrid teaching methods. The main target of this course is to let students build the network security view based on the trust and security, understand the basic comcepts about trusted computing, practice how to use trusted computing in cryptography and secure policy manage, and try to improve a security design with trusted computing. The teaching contents are mainly covered by the following aspects: the network security view based on trust and security, the basic concepts of trusted computing, trusted computing in cryptography, trusted computing in system security, and the application of trusted computing. The difficulties of teaching content are described as follows : trusted computing in cryptography, the application of trusted computing.

Recommended Textbooks/References:

1.Hu jun, Shen changxiang, Gong bei, Trusted Computing 3.0 Engineering Fundamentals(The 2nd Version), Post & Telecom *Press*, 12-2018

2.Zou Deqing, Qiang Weizhong, Jin hai. Trusted Computing Technology and Application. Science Press.2011

3.Zhang Huanguo, Zhaobo, etc. Trusted Computing. Wuhan University Press, 2011.

4.Trusted Computing Group, TCG Software Stack(TSS) Specification Version 1.2 1-2006.1 http://www.trustedcomputinggroup.org

0010062 边缘计算安全

课程编码：0010062

课程名称：边缘计算安全

英文名称：Edge Computing Security

课程类型：专业选修课

学分： 2.0 **总学时：** 32

面向对象：信息安全（实验班）本科生

先修课程：计算机网络（双语），安全协议

考核形式：笔试

撰写人：庄俊玺

课程简介：

  边缘计算安全是信息学部为信息安全专业本科生开设的专业选修课。本课程的目标是使学生了解边缘计算面临的安全威胁，掌握边缘计算的安全防护方法，培养相关的安全人才。课程的主要内容包括：边缘计算的安全架构、边缘计算的防护体系、边缘计算节点安全、边缘计算网络安全、边缘计算应用安全。教学内容的重点：从边缘计算网络、边缘计算终端、边缘计算应用三个层面系统地掌握边缘计算的安全架构及关键安全技术。教学内容的难点：把边缘计算安全理论与边缘计算应用紧密结合，培养学生的实际工程能力。

推荐教材或主要参考书：

[1] 常瑞，谢耀滨，申文博，苗新亮，周亚金. 边缘计算安全，清华大学出版社，2022

[2] 施巍松，刘芳，孙辉，裴庆祺. 边缘计算，科学出版社，2018

[3] 苗刚中，罗永龙，陶陶，陈付龙. 网络安全攻防技术---移动安全篇，科学出版社，2018

[4] 张骏. 边缘计算方法与工程实践，电子工业出版社，2019

0010062 Edge Computing Security

Course Number: 0010062

Course Title: Edge Computing Security

Course Type: Major Electives

Credit: 2.0　　　　　**Total Credit Hours:** 32

Students: Undergraduate students majoring in information security

Prerequisites: Computer Network, Network Security Protocols

Evaluation Method: Written Exam

Writer： Junxi Zhuang

Course Description:

Edge Computing Security is one of the Major Elective courses for undergraduate students Major in information security. The main target of this course is to clarify security challenges and security protection methods of edge computing. This course is focus on theory and practical engineering capabilities of edge computing security. The teaching contents are mainly covered by the following aspects: edge computing security architecture, edge computing protection system, edge computing node security, edge computing network security, edge computing application security. The difficulties of teaching contents are described as followings: Master the security architecture and key security technologies of edge computing from edge computing network and edge computing terminal and edge computing application. The difficulties of teaching contents are described as followings: how to improve the students' practical engineering capabilities by the integration of edge computing security theory and edge computing applications.

Recommended Textbooks/References:

1.CHANG Rui, XIE Yaobin, SHEN Wenbo, MIAO Xinliang, ZHOU Yajin. Tsinghua University Press，2022

2.SHI Weisong, Liu Fang, Sun Hui, Pei Qingqi, Edge Computing, *Science Press*，2018

3.MIAO Gangzhong, LUO Yonglong, TAO Tao, CHEN Fulong, Network Security Attack and Defense Technology-Mobile Security, *Science Press*，2018

4.Zhang Jun. Edge Computing Method and Engineering Practice, *Electronics Industry press*，2019

0010093 工业互联网安全

课程编码：0010093

课程名称：工业互联网安全

英文名称：Industrial Internet Security

课程类型：专业选修课

学分：2.0   **学时**：32

面向对象：信息安全（实验班）专业本科生

先修课程：计算机网络（双语）

考核形式：笔试

撰写人：詹静

课程简介：（200-300 字）

  随着新一代信息技术与制造业深度融合，"中国制造 2025" 的推进，工业互联网成为推动制造业转型升级的新型网络基础设施，面临严峻安全挑战，亟需引入大量安全人才。"工业互联网安全"课程对工业互联网面临的安全威胁，相关安全概念，关键安全技术和案例进行了系统介绍和分析，是理论与应用结合较为紧密的信息安全专业课程。本课程以安全为主线，理论与实践结合，从工业控制系统、工业互联网平台二个层次分别讨论相关安全理论和方法。

推荐教材或主要参考书：（含主编，教材名，出版社，出版日期）

[1]赖英旭，杨震，范科峰，刘贤刚，刘静，杨胜志．工业控制系统信息安全．西安电子科技大学出版社，2019

[2]闫怀志．工业互联网安全体系理论与方法．科学出版社．2019

[3] 姚羽，祝烈煌，武传坤．工业控制网络安全技术与实践．机械工业出版社．2017

0010093 Industrial Internet Security

Course Number: 0010093

Course Title: Industrial Internet Security

Course Type: Major Electives

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students major in Information Security

Prerequisites: Introduction to Computer Network

Evaluation Method: Written Exam

Writer： Jing Zhan

Course Description:

With the rapid development of next generation technology of information and manufacture, industrial internet security becomes new network infrastructure and is vital to smart manufacturing, which faces great security challenge and requires qualified personnel. Industrial internet security takes security as the main line, systematically introduces related security threat, concepts, key technologies and use cases. The student can learn industrial internet security in the view of both industrial control system and industrial internet platform.

Recommended Textbooks/References:

1. Lai Yingxu, Yang Zhen, Fan Kefeng, Liu Xiangang, Liu Jing, Yang Shengzhi. Industrial Control System Security. Xidian University Press，2019

2. Min Huaizhi. Industrial Internet Security, Architecture and Methodology. China Science Publishing & Media Ltd，2019

3. Yao Yu, Zhu Liehuang, Wu Chuankun. Industrial Control Network Security, Technology and Practice. China Machine Press，2017

0008213 数据安全与隐私保护

课程编码：0008213

课程名称：数据安全与隐私保护

英文名称：Data security and Privacy Protection

课程类型：专业选修课

学分： 2.0 **总学时：** 32

面向对象：信息安全（实验班）专业本科生

先修课程：密码学，网络空间安全导论

考核形式：平时成绩+考试

撰写人：林莉

课程简介：（250-300 字）

　　数据安全与隐私保护是信息学部为信息安全专业本科生开设的选修课。本课程的任务是从大数据的基本概念和随之带来的新型安全挑战，大数据安全与隐私保护技术框架设计、数据安全存储、数据安全检索、数据安全处理、隐私保护各项关键技术以及法律保障等方面讲述如何解决大数据时代的数据安全与隐私保护问题。教学内容重点：大数据安全与隐私保护技术框架、数据安全存储、数据安全检索、数据安全处理、隐私保护各项关键技术以及法律保障。教学内容的难点：数据安全存储、数据安全检索、数据安全处理、隐私保护各项关键技术。

推荐教材或主要参考书：

[1]《大数据安全与隐私保护》 冯登国等 编著，清华大学出版社，2018.12

[2]《大数据安全与隐私保护》石瑞生主编，北京邮电大学出版社，2019.05

[3]《大数据安全技术与应用》张尼等著，人民邮电出版社，2014.5

[4]《大数据治理与安全：从理论到开源实践》刘驰，机械工业出版社，2017.9

[5]《网络隐私保护与信息安全》 康海燕著，北京邮电大学出版社，2016.1

[6]《隐私计算理论与技术》 李凤华、李晖等著，人民邮电出版社，2021.4

0008213 Data security and Privacy Protection

Course Number: 0008213

Course Title: Data security and Privacy Protection

Course Type: Major Electives

Credit: 2.0　　　　　　**Total Credit Hours:** 32

Students: Undergraduate students majoring in Information Security

Prerequisites: Cryptography, Introduction to Cyberspace Security

Evaluation Method: Course participation + written exams

Writer： Li Lin

Course Description:

Data security and Privacy Protection is one of the Faculty of information and Technology's courses for undergraduate students Major in Information Security. The main target of this course is to clarify how to solve the problem of data security and privacy protection in the era of large data. The teaching contents are mainly covered by the following aspects: the basic concept of big data and the resulting new security challenges, big data security and privacy protection framework design, key technologies such as data security storage, data security retrieval, data security processing and privacy protection so on. This course is focus on big data security and privacy protection framework and key technologies such as data security storage, data security retrieval, data security processing and privacy protection. The difficulties of teaching contents are described as followings: data security storage technology, data security retrieval technology, data security processing technology and privacy protection technology.

Recommended Textbooks/References:

1. Feng Deng-guo et al., Big Data Security and Privacy Protection, Tsinghua University Press, December 2018.

2.Shi Rui-sheng Ed., Big Data Security and Privacy Protection, Beijing University of Posts and Telecommunications Press, May 2019.

3. Zhang Ni et al., Big Data Security Technology and Application, Posts and Telecommunications Press, May 2014.

4. Liu Chi, Big Data Governance and Security: from Theory to Open Source Practice. China Machine Press, September 2017.

5. Kang Hai-yan, Privacy Protection and Information Security. Beijing University of Posts and Telecommunications Press, January 2016.

6. Li Feng-hua, Li Hui et al., Theory and Technology of Privacy Computing, Posts and Telecommunications Press, April 2021.

0008209 逆向工程

课程编码：0008209

课程名称：逆向工程

英文名称：Reverse Engineering

课程类型：专业选修课

学分： 2.0　　**总学时：** 32

面向对象：信息安全（实验班）专业本科生

先修课程：高级语言程序设计、汇编语言程序设计

考核形式：平时成绩+实验成绩

撰写人：王昱波

课程简介：（250-300 字）

　　逆向工程是信息学部为信息安全专业本科生开设的专业限选课。本课程的任务是引导学生从低阶视角再认识程序代码，深入了解程序代码的相关知识。培养其逆向思维、掌握逆向工程的核心原理和概念。除了学习知识外，还要学习静态和动态代码分析、特定信息查找等典型技术；给学生提供参与逆向工程的机会，培养其工程意识和能力。逆向工程重点是学习分析技术和软件调试分析检测工具的应用，为理解软件代码的复杂度和弄清"真相"提供了切实可行的方法。难点在于从全新的低阶视角审视现有的程序，以便评价软件的安全等级，改进提高安全等级，检查软件中的恶意代码，发现软件产品中的安全漏洞，在开发安全产品时与已存在的程序兼容等。

推荐教材或主要参考书：

[1]　　李承远著，武传海译. 逆向工程核心原理. ：人民邮电出版社 2014 年 5 月

[2]　　宁书林著. 　软件逆向分析实用技术：北京理工大学出版社 2013 年 3 月

0008209 Reverse Engineering

Course Number: 0008209

Course Title: Reverse Engineering

Course Type: Major Electives

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in Information Security

Prerequisites: Advanced Language Programming, Assembly Language Programming

Evaluation Method: Course participation + written exams

Writer： Yubo Wang

Course Description:

Reverse engineering is a limited course for undergraduates majoring in information security. The task of this course is to guide students to understand the program code from a low-level perspective, and further understand the relevant knowledge of the program code. Cultivate their reverse thinking and master the core principles and concepts of reverse engineering. In addition to learning knowledge, we should also learn static and dynamic code analysis, specific information search and other typical technologies; provide students with the opportunity to participate in reverse engineering, and cultivate their engineering awareness and ability. Reverse engineering focuses on the application of analysis technology and software debugging analysis and detection tools, which provides a practical method for understanding the complexity of software code and clarifying the "truth". The difficulty lies in examining the existing programs from a new low-level perspective in order to evaluate the security level of the software, improve the security level, check the malicious code in the software, find the security vulnerabilities in the software products, and be compatible with the existing programs when developing the security products.

Recommended Textbooks/References:

1.Li Chengyuan, translated by Wu Chuanhai, Core Principles of Reverse Engineering, *People's post and Telecommunications Press*, May-2014

2.Ning Shulin, Practical Technology of Software Reverse Analysis, *Beijing University of Technology Press*, March-2013

0010135 区块链安全技术

课程编码：0010135

课程名称：区块链安全技术

英文名称：Blockchain Security Technology

课程类型：专业选修课

学分： 2.0 **总学时：** 32

面向对象：信息安全（实验班）专业本科生

先修课程：

考核形式：平时成绩+考试

撰写人：于海阳

课程简介：（250-300 字）

本课程对区块链核心技术、区块链安全机制、区块链与安全技术等方面进行了比较深入的分析和介绍。在核心技术方面重点介绍了区块链的密码学基础、共识机制、智能合约以及典型项目。在安全机制方面介绍了针对区块链中的数据、交易、隐私、监管等方面的安全机制。在区块链与安全技术方面，重点阐述了区块链在大数据、身份认证、物联网、分布式存储等方面的安全技术中的典型应用。

推荐教材或主要参考书：

[1] 朱建明，高胜，段美姣等. 区块链技术与应用. 机械工业出版社，2018.

[2] 王飞跃，袁勇. 区块链理论与方法. 清华大学出版社，2019.

[3] Rajneesh Gupta 著，孙国梓译. 区块链安全实战. 机械工业出版社，2019

[4] 黄连金，吴思进，曹锋，季宙栋等. 区块链安全技术指南. 机械工业出版社，2018

0010135 Blockchain Security Technology

Course Number: 0010135

Course Title: Blockchain Security Technology

Course Type: major elective course

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in information security

Prerequisites:

Evaluation Method: Course participation + written exams

Writer: Haiyang Yu

Course Description:

This course analyzes and introduces in depth the core technology of blockchain, blockchain security mechanism, blockchain and security technology. In terms of core technology, the cryptographic foundation, consensus mechanism, smart contracts, and typical projects of the blockchain were introduced. In terms of security mechanisms, the security mechanisms for data, transactions, privacy, and supervision in the blockchain are introduced. In terms of blockchain and security technology, the typical applications of blockchain in security technologies such as big data, identity authentication, the Internet of Things, and distributed storage are highlighted.

Recommended Textbooks/References:

1.Zhu Jianming, Gao Sheng, Duan Meijiao, etc. Blockchain Technology and Application. Mechanical Industry Press, 2018.

2.Wang Feiyue, Yuan Yong. Blockchain theory and method. Tsinghua University Press, 2019.

3.Rajneesh Gupta, translated by Sun Guozi. Blockchain security practice. Machinery Industry Press, 2019

4.Huang Lianjin, Wu Sijin, Cao Feng, Ji Zhoudong, etc. Blockchain Security Technology Guide. Machinery Industry Press, 2018

0008216 信息安全标准

课程编码：0008216

课程名称：信息安全标准

英文名称：Information Security Standard

课程类型：选修课

学分： 2.0　　**总学时：** 32

面向对象：信息安全及信息学部其它专业本科生

先修课程：无

考核形式： 平时成绩+考试

撰写人：赵勇

课程简介：（250-300 字）

信息安全标准是信息学部为信息安全及信息学部其它专业本科生开设的选修课。本课程的任务是培养学生掌握信息安全标准的制定背景、相关术语、核心内容、关联关系等，使其对国际和国内信息安全领域相关标准有一个基本了解，从而整体上对信息安全有一个宏观认识。教学内容重点：以信息安全工程实施为主线，以国家等级保护政策为核心，通过对国内外典型的、核心的安全需求类、安全建设与实施类、安全评估类、安全管理类等信息安全标准的讲解与讨论，向学生传授信息安全工程的有关知识和方法，培养学生的宏观把控能力。教学内容的难点：信息安全建设及评估类体系和方法论。

推荐教材或主要参考书：

[1]郭启全.信息安全等级保护政策培训教程.北京：电子工业出版社.2016

[2]国家标准《信息安全技术　信息系统安全等级保护定级指南》（GB/T22240-2010）

[3]国家标准《信息安全技术　网络安全等级保护基本要求》（GB/T22239-2019）

[4]国家标准《信息安全技术　网络安全等级保护安全设计技术要求》（GB/T 25070-2019）

0008216 Information Security Standard

Course Number: 0008216

Course Title: Information Security Standard

Course Type: Optional course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Computer and Information Security Speciality

Prerequisites: No Prerequisite

Evaluation Method: Course participation + written exams

Writer: Yong Zhao

Course Description:

Information Security Standard is one of the Optional courses for undergraduate students Major in Computer and Information Security Speciality. The main target of this course is to teach students the information security engineering knowledge and methods as well as develop their ability to solve real problems. The students are required to grasp the developing background, terminology, core content and related relationship of the standard, so that they have a basic understanding of relevant international and domestic information security standards, so as to have a general understanding on the whole. This course is focus on the implementation of information security engineering as the main line and the national level protection policy as the core. Based on the analysis of typical and core security requirements, safety construction and implementation, safety evaluation and the explanation of safety management and other information security standards. The difficulties of teaching contents are described as followings: information security construction and evaluation system and methodology.

Recommended Textbooks/References:

1. Guo Qiquan. Information security classification protection policy training course. Publishing House of Electronics industry.2016

2. GB/T22240-2008. Information security technology- Classification guide for classified protection of information system.

3. GB/T22239-2019. Information security technology Baseline for classified protection of cybersecurity

4. GB/T 25070-2019. Information security technology — Technical requirements of security design for classified protection of cybersecurity

0009394 新生研讨课

课程编码：0009394

课程名称：新生研讨课

英文名称：Freshman Seminars

课程类型：自主课程

学分： 1.0 **总学时：** 16

面向对象：信息安全（实验班）本科生

先修课程：无

考核形式：平时成绩+报告

撰写人：侍伟敏

课程简介：（250-300 字）

新生研讨课是计算机学院为信息安全专业本科生开设的自主课程。本课程的任务是让学生理解信息安全在社会、经济发展中的地位与作用；了解专业培养目标、毕业要求和课程体系；了解专业发展过程、现状和就业前景；初步了解信息安全的关键技术和前沿技术；熟悉和掌握专业文献的来源及获取方法。教学内容重点： "走进信息安全专业"、"浅谈信息安全技术"、"量子技术与信息安全"、"区块链技术及安全"、"新型计算环境下的信息安全"。教学内容的难点：信息安全的关键技术和前沿技术。

推荐教材或主要参考书：

[1]张建标、赖英旭、侍伟敏. 信息安全体系结构. 北京工业大学出版社. 2011 年 09 月.

[2]杨义先、钮心忻. 安全简史. 机械工业出版社. 2017 年 03 月.

[3][美] F.G.Major. 现代导航的演进——量子技术的兴起. 国防工业出版社. 2018 年 06 月.

[4]陈晖. 密码前沿技术--从量子不可精确克隆到 DNA 完美复制. 国防工业出版社. 2015 年 06 月.

[5]华为区块链技术开发团队. 区块链技术及应用. 清华大学出版社. 2019 年 03 月.

[6]黄连金、吴思进、曹锋、季宙栋等. 区块链安全技术指南. 机械工业出版社. 2018 年 05 月.

[7]杨东晓、张锋、陈世优. 云计算及云安全. 清华大学出版社. 2020 年 05 月 .

[8][美] 布莱恩.罗素（Brian Russell）、 德鲁.范.杜伦（Drew Van D）. 物联网安全. 机械工业出版社. 2020 年 04 月.

[9]牛少彰. 移动互联网安全. 机械工业出版社. 2020 年 05 月.

[10]石瑞生. 大数据安全与隐私保护. 北京邮电大学出版社. 2019 年 05 月.

[11]范渊. 智慧城市与信息安全(第 2 版). 电子工业出版社. 2016 年 09 月.

0009394 Freshman Seminars

Course Number: 0009394

Course Title: Freshman Seminars

Course Type: Major Independents

Credit: 1.0 **Total Credit Hours:** 16

Students: Undergraduate students majoring in Information Security

Prerequisites: No

Evaluation Method: Course participation + Report

Writer： Weimin Shi

Course Description:

Freshman Seminars is one of the autonomous courses for undergraduate students Major in Information Security of College of Computer Science and Technology. The main target of this course is to clarify the status and role of information security in social and economic development, Professional training objectives and graduation requirements and curriculum system, Professional development process and current situation and employment prospects, Key technologies and advanced technologies of information security, Sources and acquisition methods of professional literature. This course is focus on information security advanced technology. The teaching contents are mainly covered by the following aspects: "Into the Information Security Major", "Talking about Information Security Technology", "Quantum Technology and Information Security", "Blockchain Technology and Security", "Information Security in the New Computing Environment". The difficulties of teaching contents are described as followings: Key technologies and advanced technologies of information security.

Recommended Textbooks/References:

1.Zhang JianBiao、Lai YingXu、Shi WeiMin. Information Security Architecture. *Beijing University of Technology Press.* September 2011.

2.Yan YiXian、Niu XinXin. Brief History of Information Security. *Machinery Industry Press*. March 2017.

3.[US] F.G. Major. The evolution of modern navigation-the rise of quantum technology. *National Defense Industry Press*. June 2018.

4.Chen Hui. Cryptographic frontier technology-from quantum inaccurate cloning to perfect DNA replication. *National Defense Industry Press*. June 2015.

5.Huawei Blockchain Technology Development Team. Blockchain Technology and Application. *Tsinghua University Press*. March 2019.

6.Huang LianJin, Wu SiJin, Cao Feng, Ji ZhouDong, etc. Blockchain Security Technology Guide. *Machinery Industry Press*. May 2018

7.Yang DongXiao, Zhang Feng, Chen ShiYou. Cloud Computing and Cloud Security. *Tsinghua University Press*. May 2020.

8.[US] Brian Russell, Drew Van D. Internet of Things Security. *Machinery Industry Press*. April 2020.

9.Niu ShaoZhang. Mobile Internet Security. *Machinery Industry Press*. May 2020.

10.Shi RuiSheng. Big Data Security and Privacy Protection. *Beijing University of Posts and Telecommunications Press*. May 2019.

11.Fan Yuan. Smart City and Information Security (Second Edition). *Electronics Industry Press*. September 2016.

0007384 认识实习

课程编码：0007384

课程名称：认识实习

英文名称：Cognitive Practice

课程类型：自主课程

学分： 1.0 **总学时：** 16

面向对象：信息安全（实验班）本科生

先修课程：

考核形式： 平时成绩+报告

撰写人：于海阳

课程简介：（250-300 字）

认识实习是信息学部为信息安全专业本科生开设自主课程类型。本课程主要通过参观学习、交流和讲座，使学生对专业相关的实际工作环境和技术发展趋势前沿有深入了解，增加对于专业未来发展和自身未来发展的认识。认识实习旨在通过参观与专业相关的企业、校际交流、与领域专家进行讲座等方式提高学生对专业的认知度，使学生了解在相关领域的实际工作中与大学专业学习内容的关系、相关领域的发展趋势和前沿，以及学生未来就业情况。

推荐教材或主要参考书：

0007384 Cognitive Practice

Course Number: 0007384

Course Title: Cognitive Practice

Course Type: independent course

Credit: 1.0   **Total Credit Hours:** 16

Students: Undergraduate students majoring in information security

Prerequisites:

Evaluation Method: Course participation + reports

Writer: Haiyang Yu

Course Description:

Cognitive Practice is one of the independent courses for undergraduate students Major in information security. This course is mainly through visits, learning, exchanges and lectures, so that students have a deep understanding of the actual working environment and the frontier of technological development trends related to the profession, and increase their understanding of the future development of the profession and their own future development. Cognitive internships aim to increase students' awareness of majors through visits to major-related companies, inter-school exchanges, and lectures with field experts, so that students can understand the relationship between the actual work in related fields and the content of university majors, The development trends and frontiers of related fields, and the future employment of students.

Recommended Textbooks/References:

0008163 汇编语言程序设计

课程编码： 0008163

课程名称： 汇编语言程序设计

英文名称： Assembly Language Programming

课程类型： 自主课程

学分： 2.0　　**总学时：** 32

面向对象： 信息安全（实验班）专业本科生

先修课程： 计算机组成原理

考核形式： 平时成绩+闭卷考试

撰写人： 蔡旻

课程简介：（250-300 字）

　　汇编语言程序设计是信息学部为信息安全（实验班）专业本科生开设的专业选修课。本课程的任务是系统地培养学生对汇编语言程序设计的认知，使他们深入理解计算机系统理论，并进一步掌握高级程序设计语言在底层如何被转换和执行。教学内容重点：详细介绍汇编语言的格式、伪指令与宏指令的使用，探讨程序设计中的分支、循环及子程序的设计原理，阐述汇编程序的开发与调试过程，深入解读 CPU 的架构和工作原理，以及指令调度、高效存储器管理和基础输入输出处理技术。教学内容的难点：汇编语言中的变量组织方式、深入理解地址的访问机制、机器指令层面上的循环与分支处理逻辑，以及函数调用过程中参数的传递和管理方法。

推荐教材或主要参考书：

[1] 易小琳、朱文军、鲁鹏程、方娟、毛国君.计算机组成原理与汇编语言.北京：清华大学出版社，2009 年

[2] 沈美明、温冬婵. IBM-PC 汇编语言程序设计（第二版）. 北京：清华大学出版社，2001 年

[3] 卜艳萍、周伟.汇编语言程序设计教程（第二版）.北京：清华大学出版社，2007 年

[4] 李国安、李敏.汇编语言编程技术. 郑州：郑州大学出版社，2007 年

0008163 Assembly Language Programming

Course Number: 0008163

Course Title: Assembly Language Programming

Course Type: Independent Courses

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in Information Security

Prerequisites: Principle of computer organization

Evaluation Method: Course participation + written exams

Writer： Cai Min

Course Description:

Assembly Language Programming is a major elective course offered by the Faculty of Information for undergraduate students majoring in Information Security. The objective of this course is to systematically cultivate students' understanding of assembly language programming, enabling them to delve deeply into the theory of computer systems and further grasp how high-level programming languages are converted and executed at the lower levels. Key teaching content includes: a detailed introduction to the format of assembly language, the use of pseudo-instructions and macro instructions, exploration of the principles of branching, looping, and subroutine design in program development, elaboration on the development and debugging process of assembly programs, in-depth interpretation of CPU architecture and its operational principles, as well as instruction scheduling, efficient memory management, and basic input/output processing techniques. The challenging aspects of the course content are: the organization of variables in assembly language, a deep understanding of addressing mechanisms, the logic of handling loops and branches at the machine instruction level, and the methods of parameter passing and management during function calls.

Recommended Textbooks/References:

1. Yi Xiaolin, Zhu Wenjun, Lu Pengcheng, Fang Juan, Mao Guojun. Principles of Computer Composition and Assembly Language. Beijing: Tsinghua University Press, 2009

2. Shen Meiming, Wen Dongchan. IBM-PC Assembly Language Programming (Second Edition). Beijing: Tsinghua University Press, 2001

3. Bu Yanping, Zhou Wei. Assembly language programming tutorial (second edition). Beijing: Tsinghua University Press, 2007

4. Li Guoan, Li Min. Assembly language programming technology. Zhengzhou: Zhengzhou University Press, 2007

0010122 密码应用

课程编码： 0010122

课程名称： 密码应用

英文名称： Cryptographic Applications

课程类型： 自主课程

学分： 2.0　　**总学时：** 32

面向对象： 信息安全（实验班）专业本科生

先修课程： 密码学Ⅰ

考核形式： 平时成绩+考试

撰写人： 杨宇光

课程简介：（250-300 字）

　　密码应用是信息学部计算机学院为信息安全专业本科生开设的自主课程。本课程的任务是以工程技术为主线，在讲述面向特定应用的密码协议基本原理的同时，注重密码算法的应用，通过精选贴近生活以及新应用的密码学典型应用案例，使学生了解国内外密码算法的应用现状，增强学生对密码应用的现实感和信息安全的紧迫性，强化信息安全意识，培养学生密码学工程实践能力。本课程从密码的基本概念和技术、特殊数字签名技术、密钥管理、电子现金与电子支付系统、安全电子选举系统、安全多方计算等密码技术及密码法等方面讲述如何解决密码学工程问题。

推荐教材或主要参考书：

[1] 胡向东，魏琴芳，胡蓉　著. 应用密码学（第4版）. 电子工业出版社，2019-05-01

[2] ［美］　理查德 E. 布拉胡特（Richard E. Blahut）　著，黄玉划，薛明富，许娟　译. 现代密码学及其应用. 机械工业出版社，2018-05-01

[3]吴世忠，祝世雄，张文政　等应用密码学：协议、算法与 C 源程序（原书第 2 版），机械工业出版社，2014-1

0010122 Cryptographic Applications

Course Number: 0010122

Course Title: Cryptographic Applications

Course Type: Major Independents

Credit: 2.0   **Total Credit Hours:** 32

Students: Undergraduate students majoring in Information Security

Prerequisites: Cryptography

Evaluation Method: Course participation + written exams

Writer： Yuguang Yang

Course Description:

The course is one of the major independents for undergraduate students majoring in Information Security. The main target of this course is to clarify the fundamentals and applications of cryptographic protocols to undergraduate students majoring in Information Security and train them to have the capability of solving the specified information security problems by applying related cryptographic algorithms and protocols. This course is focus on the applications of cryptographic protocols and algorithms. The teaching contents are mainly covered by the following aspects: the basic concepts of cryptography, special digital signature, key management, electronic cash and secure electronic payment, secure electronic voting, and secure multi-party computation, cryptographic law and so on.

Recommended Textbooks/References:

1.Xiang-Dong Hu, Qin-Fang Wei, Rong Hu. Applied Cryptography, *Electronic Industry Press*, 05-2019.

2.Richard E. Blahut. Modern cryptography and its applications. *China Machine Press*, 05-2018.

3.Shi-Zhong Wu, Shi-Xiong Zhu, Wen-Zheng Zhang, et al. Applied Cryptography: Protocols, Algorithms, and Source Code in C (Second Version), *China Machine Press*, 01-2014.

0010711 学术写作

课程编码： 0010711

课程名称： 学术写作

英文名称： Academic writing

课程类型： 专业选修课

学分： 1.0   **总学时：** 16

面向对象： 信息安全（实验班）专业本科生

先修课程： 无

考核形式： 平时成绩+考察

撰写人： 陈渝文

课程简介： （250-300 字）

　　学术写作是计算机学院（部）为信息安全专业本科生开设的专业选修课课程类型。本课程的任务是通过学习学术写作，为学生最后撰写毕业论文和发表科技论文打下良好基础，并掌握撰写毕业论文方法、技巧和能力。论文是展现研究成果的一种重要方式，也是科研工作者与同行交流的一个重要途经，学术论文写作方法和规范是学生应该掌握的基本知识和基本技能，为将来从事科学研究打下基础。并且掌握口头、书面与同行和相关人员进行有效沟通和交流的能力。教学内容重点：期刊评价标准，论文管理工具的使用，如何写综述，撰写开题报告，毕业论文的写作。教学内容的难点：论文管理工具的使用，摘要的主要内容，如何提取关键词。

推荐教材或主要参考书：

[1] 张孙玮，吕伯昇，张 迅，科技论文写作入门(第五版)，化学工业出版社，2017 年 2 月

[2] 李玉浩，Writing English Research Papers 英语学术写作概论，知识产权出版社，2013 年 8 月

[3] 罗伊娜·默里等，学术写作手册：一种新方法，上海教育出版社，2011 年 6 月

[4] 王雨磊，学术论文写作与发表指引， 中国人民大学出版社，2017 年 9 月

[5] 海伦· 索德，学术写作指南：100 位杰出学者的写作之道，人民教育出版社，2018 年 12 月

0010711 Academic writing

Course Number: 0010711

Course Title: Academic writing

Course Type: Subject Elective

Credit: 1.0   **Total Credit Hours:** 16

Students: Undergraduate students majoring in Computer and Information Security

Prerequisites: none

Evaluation Method: Course participation + paper

Writer: Yuwen Chen

Course Description:

Academic writing is one of the subject elective courses for undergraduate students Major in Computer and Information Security. The main target of this course is to clarify how to write academic papers, to help students write thesis and scientific publications and gain the skills, abilities, and methods to write final thesis. This course is focus on paving a way for students to communicate with others and lay the foundation for conducting scientific research, as paper is an important way of revealing research results. The teaching contents are mainly covered by the following aspects: evaluation standard of journals, how to write a summary, how to write a thesis. The difficulties of teaching contents are described as followings: reference manage software, the main content of an abstract, how to extract key words.

Recommended Textbooks/References:

1. Sunwei Zhang，Bosheng Li，Xun Zhang，Introduction to scientific writing (5ᵗʰ Edition)，*Chemical Insustry Press*，February-2017

2. Yuhao Li，Writing English Research Papers，*Intellectual Property Publishing House*，August-2013

3. Rowena Murray et al.，The handbook of Academic writing: a fresh approach，*Shanghai educational publishing house*，June-2011

4. Yulei Wang，Guidelines for writing and publishing academic papers，*China Renmin University Press*，September-2017

5. Halen· Sword，Air & Light & Time & Space How Successful Academics Write，*People's education Press*，December-2018

0010709 学科前沿

课程编码：0010709

课程名称： 学科前沿

英文名称： Subject Frontiers

课程类型： 自主课程

学分： 1.0   **总学时：** 16

面向对象： 信息安全专业本科生

先修课程：

考核形式： 报告

撰写人： 于海阳

课程简介：（250-300 字）

  学科前沿是计算机学院（部）为信息安全专业本科生开设的课程。本课程的任务是主要介绍信息安全领域的各个分支方向，深入介绍每个方向的前沿理论和前沿工作，重点涉及密码学、网络安全、数据安全、软件安全、人工智能安全、分布式安全等方向的前沿。

推荐教材或主要参考书：

0010709 Subject Frontiers

Course Number: 0010709

Course Title: Subject Frontiers

Course Type: Independent course

Credit: 1.0   **Total Credit Hours:** 16

Students: Undergraduate students majoring in information security

Prerequisites:

Evaluation Method: Reports

Writer： Haiyang Yu

Course Description:

Subject Frontiers is one of the courses for undergraduate students Major in information security. The main target of this course is to clarify XXX. This course mainly introduces the branches of information security, and introduces the cutting-edge theories and work in each direction, focusing on the frontiers of cryptography, network security, data security, software security, artificial intelligence security, and distributed security.

Recommended Textbooks/References: