

重庆大学研究生“信息与数据安全”课程教学大纲

1. **课程名称：**信息与数据安全 **课程代码：**TBA

2. **课程学时：**32 **课程学分：**2

3. **适用对象：**软件工程专业学术型、专业硕士

4. **先修课程：**选课学生在大学本科已修相关课程，具备信息系统分析、设计和开发的基本能力。先修课程包括但不限于：计算机网络与通信、信息系统基础、面向对象程序设计、操作系统原理、数据库原理、数据结构与算法、信息安全导论。

5. **开课学院：**软件学院

6. **主讲教师：**向宏、傅鹏、桑军、胡海波、蔡斌、夏晓峰

7. **教材及参考书目：**
 - 7.1 **教材**

[1] Stamp M. *Information security: principles and practice*, 2nd ed., John Wiley & Sons, 2011.
Stamp M(著), 张戈(译), 信息安全原理与实践, 第2版, 清华大学出版社, 2013.5.
 - 7.2 **参考书目**

[2] Matt Bishop, *Computer Security: Art and Science* (英文影印版) 1st ed., 清华大学出版社, 2004.5.

[3] B. Forouzan, *Introduction to Cryptography & Network Security*, McGraw-Hill, 2008

8. **课程简介及主要内容（500字）：**
 - 8.1 **课程简介**

随着全球信息化的普及和深入，电子政务、电子商务、物联网、云计算、社会信息网络、移动计算等技术和应用的普及，使得社会团体和个人对信息系统和网络通信的依赖与日俱

增。但是信息系统和网络通信的高度复杂性和联通性，使得其自身具有的不可消除的技术缺陷，现实社会中的各种矛盾和冲突也即在这个虚拟的社会空间映射和扩散。在此背景下，信息安全问题日益突出，为政治、外交、经济、科技、国防、民生等各个领域带来了前所未有的挑战。

为了适应我国在未来信息化建设过程中的人才需求，培养面向软件工程领域和信息系统安全分析设计方向的专业技术人才，结合当前信息安全领域的发展方向，特为软件工程领域硕士研究生开设本门选修课程，旨在拓展和完善研究生的知识和能力结构。

8.2 课程目标和内容

通过本课程的学习，应当使硕士研究生能够对信息和数据安全的原理、方法和实践有一个比较系统和全面的了解，扩展和完善软件工程领域人才培养所需的知识结构，从而使学生在信息和数据安全方向领域具备分析和解决问题的能力。本课程的主要内容包括密码学的原理与应用、信息数据安全的挑战、多媒体安全、数据隐私保护四个主题。

9. 教学内容、教学方式及学时分配

9.1 教学内容

本课程的主要内容包括 4 个主题，每个主题下面分 2-3 个专题。

- ◆ 密码学的原理与应用：对称密码、公钥密码、哈希函数、同态加密
- ◆ 信息数据安全的挑战：安全威胁和安全服务
- ◆ 多媒体安全：信息隐藏与数字水印——原理与方法
- ◆ 数据隐私保护：云计算、移动计算、社会网络中的数据隐私和保护技术

9.2 教学方式

本课程的授课方式包括专题讲座、课堂讨论、课外作业等环节。在教学内容的 4 个主题中，每个主题包含 6 个学时的专题讲座和 2 个学时的课堂讨论；针对每个主题，学生需要完成相关的课外作业。专题讲座由主讲教师讲授，涵盖该专题或主题下的基本原理和方法；课堂讨论则由教师主持，提出该主题或专题下的开放问题，由教师和学生共同研讨。

9.3 学时分配

上课次数	学时	教学内容	教学方式（授课、研讨、实验等）
1	8	密码学原理与应用	授课 6，研讨 2
2	8	信息数据安全的挑战	授课 6，研讨 2
3	8	多媒体安全	授课 6，研讨 2

4	8	隐私保护	授课 6, 研讨 2
合计	32	授课 24 学时, 研讨 8 学时	

10. 考核及成绩评定方式

- ◆ 考勤：20%。主要考查选课学生到课情况、课堂讨论的参与程度。
- ◆ 作业：20%。主要考查选课学生在课外进行扩展阅读、学习的能力及效果。
- ◆ 试卷：60%。期末考试为开卷考试，主要考查选课学生对知识点的掌握情况。

Syllabus of Information and Data Security

for Graduate Programs in Chongqing University

1. **Course Title:** Information and Data Security **Course Code:** TBA

2. **Credits:** 2 **Teaching hours:** 32 hrs

3. **Applied Objects:** Postgraduate Students majoring Software Engineering

4. **Prerequisite Courses:** The postgraduate students who registered this course should have qualified themselves with knowledge basis includes (but not limit to), *Computer Networks*, *Basis for Information Systems*, *Object-Oriented Programming*, *Operating Systems*, *Database*, *Data Structure and Algorithms*, *Basis for Information Security*.

5. **Institute:** School of Software Engineering

6. **Instructors:** Prof. Xiang Hong, Prof. Fu Li, Prof. Sang Jun, Dr. Hu Haibo, Dr. Cai Bin, and Dr. Xia Xiaofeng.

7. Recommended Reading Materials

7.1 Primary

[1] Stamp M. *Information security: principles and practice*, 2nd ed., John Wiley & Sons, 2011.

7.2 Secondary

[2] Matt Bishop, *Computer Security: Art and Science*, 1st ed., Tsinghua University Press, 2004.5.

[3] B. Forouzan, *Introduction to Cryptography & Network Security*, McGraw-Hill, 2008

8. Course Description

8.1 Backgrounds

With the development of Information Technology, the services as E-Government,

E-Commerce, Cyber Physical Systems, Cloud Computing, Social Networks, Mobile Computing, etc., became indispensable aspects of our daily life. While the complicity of the information and software system, as well as highly connectivity of computer networks, make the systems themselves can not be free from infects and security vulnerabilities. Moreover, the conflicts from the human society make these security problems even worse, so that attack & defense are mapped and propagated in the cyber space. In this background, information security becomes one of the most critical issues nowadays, as it takes unprecedented challenges for politics, diplomacy, economics, science and technology, national defense, as well as the people's livelihood.

In order to meet the need of educating and training professionals for IT community in the coming future, to qualify the talents with specified knowledge and skills with software development and security analysis, the course aims to fulfill the task as improving the knowledge and quality structures for postgraduate students majoring software engineering .

8.2 Objective

When finished studding this course, the graduate students should qualify themselves with theory, methodology and practices for information and data security. More, the course would further registered students' abilities of analyzing and problem-solving with regard to information and data security. The content of this course will be organized into four topics as cryptography, challenges for information & data security, multimedia security and privacy protection.

9. Scope and Means-ends

9.1 Scope

There are four topics as,

- ◆ Cryptography: Symmetric Cryptography, Asymmetric Cryptography, Cryptographic Hash Function,
- ◆ Challenges for Information and Data Security: Security Threats and Services
- ◆ Multimedia Security: Information Hiding and Digital Watermarking
- ◆ Data Privacy Protection: Data Privacy Protection issues in cloud, mobile and social networks

9.2 Means-ends

Means-ends of the course include lecture, seminar and assignment. With respect to each topic,

there are 6 hrs for lecture and 2 hrs for seminar. The registered students should do their homework to strengthen the skills.

9.3 Scheduling

No	Hrs	Topics	Means-end
1	8	Cryptography	L:6, S:2
2	8	Threats and Services for Information and Data security	L:6, S:2
3	8	Multimedia Security	L:6, S:2
4	8	Privacy Protection	L:6, S:2
Total	32	Lecture:24hrs, Seminar:8hrs	

10. Grading Policy

- ◆ Attendance: 20%
- ◆ Assignments: 20%
- ◆ Examination: 60%