

信息安全

一、培养目标

依据“工程教育认证标准”制定培养方案，培养具有良好的人文、科学与工程素养，具有较扎实的数理基础，系统掌握计算机与信息安全领域的数理基础，具备科学研究能力；熟练掌握基本的密码学技术、网络安全技术、信息系统安全技术，信息内容安全技术，具有坚实的专业理论知识、良好的科学思维方法和系统的工程实践技术，具备工程创新能力；掌握信息安全基本理论与基本方法，应具备研究、开发与管理信息安全系统的能力，涉及信息安全系统分析与设计、安全防护、安全策略制订、工程开发以及运维管理等能力；至少熟练掌握一门外语，了解信息安全相关领域的国际发展前沿，具备国际视野与合作能力的人才。

二、基本规格要求

信息安全专业本科毕业生应达到如下要求：

1. 工程知识：能够将数学、自然科学、工程基础和计算机专业知识用于解决信息系统安全方面的复杂工程问题。
2. 问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达并通过文献研究分析信息系统安全复杂工程问题，以获得有效结论。
3. 设计/开发解决方案：能够设计针对信息系统安全复杂工程问题的解决方案，设计满足特定安全需求的信息系统、单元（部件）或工艺流程，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。
4. 研究：能够基于科学原理并采用科学方法对信息系统安全方面的复杂工程问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。
5. 使用现代工具：能够针对信息系统复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对复杂工程问题的预测与模拟，并能够理解其局限性。
6. 工程与社会：能够基于工程相关背景知识进行合理分析，评价网络空间安全工程实践和信息系统复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。
7. 环境和可持续发展：能够理解和评价针对信息系统安全复杂工程问题的工程实践对环境、社会可持续发展的影响。
8. 职业规范：具有人文社会科学素养、社会责任感，能够在信息系统安全工程实践中理解并遵守工程职业道德和规范，履行责任。
9. 个人和团队：能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。
10. 沟通：能够就信息系统安全复杂工程问题与业界同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令。并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。
11. 项目管理：理解并掌握工程管理原理与经济决策方法，并能在多学科环境中应用。
12. 终身学习：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

三、培养特色

本专业在教育部本科专业目录中属于信息安全专业，培养方案以信息安全教育专业认证标准为

准则, 结合本校实际制定; 在注重网络空间安全一级学科基础知识与专业技能的同时, 锻炼信息安全工程实践能力, 培养科学研究与技术创新素养, 加强学科交叉与国际交流, 更突出了计算机系统安全, 网络安全、信息内容安全与信息挖掘等多研究方向的交叉融合特色。

四、学制、毕业基本要求及学位授予

1. 本科基本学制 4 年, 弹性学习年限 3—6 年, 按照学分管理制度管理。
2. 信息安全专业学生毕业最低学分数为 165 学分, 其中各类别课程及环节要求学分数如下表:

课程类别	通识必修	学门核心	学类核心	专业核心	专业选修	通识选修	集中实践	合计
学分数	24	24	28	13	35	8	33	165

3. 学生修满培养方案规定的必修课、选修课及有关环节, 达到规定的最低毕业学分数, 并修完规定必修但不记学分的所有课程和环节, 德、智、体合格, 即可毕业。满足学位授予相关文件要求的, 授予工学学士学位。

五、课程设置及学分分布

(一) 通识教育课程 (必修 24 + (6) 学分 + 选修 8 学分)

通识教育课程包括必修和选修两部分。通识选修课程按《湖南大学通识选修 (文化素质教育) 课程方案》实施, 通识必修课程如下:

编码	课程名称	学分	备注
GE01101	毛泽东思想和中国特色社会主义理论体系概论	3+ (3)	
GE01039	思想道德修养与法律基础	1.5+ (1.5)	
GE01100	形势与政策	0.5+ (1.5)	
GE01102	中国近现代史纲要	2	
GE01103	马克思主义基本原理 (上)	2	
GE01104	马克思主义基本原理 (下)	2	
GE01012 (-15)	大学英语	8	
GE01107 (-13)	心理素质与生涯发展	1	
GE01089 (-92)	体育	4	

(二) 学门核心课程 (24 学分)

编码	课程名称	学分	备注
GE03025	高等数学 A (1)	5	
GE03025	高等数学 A (2)	5	
GE03003	线性代数 A	3	
GE03004	概率论与数理统计 A	3	
GE03005	普通物理 A (1)	3	
GE03006	普通物理 A (2)	3	
GE03007	普通物理实验 A (1)	1	
GE03008	普通物理实验 A (2)	1	

(三) 学类核心课程 (28 学分)

编码	课程名称	学分	备注
CS04022	高等程序设计	4	
CS04001	离散数学	4	
CS05054	数字电路与逻辑设计	4	
CS04023	计算机系统	4	
CS04002	数据结构	4	
CS04007	操作系统	4	
CS04021	程序设计实验	2	
CS04024	数字系统实验	1	
CS04026	网络系统实验	1	

(四) 专业核心课程 (13 学分)

编码	课程名称	学分	备注
CS05081	算法设计与分析	4	
CS05082	计算机网络	4	
CS05083	数据库系统	4	
CS05084	安全系统实验	1	

(五) 专业选修课程 (35 学分)**(1) 专业限选课 (11 学分)**

本专业学生必须选修以下课程，以强化专业基础，总计 11 学分。

编码	课程名称	学分	备注
CS06177	信息安全数学基础	3	
CS06178	密码学	4	
CS06179	网络安全	4	

(2) 专业任选课程 (24 学分)

专业任选课程采用方向分组与任选相结合的方式实施。建议本专业学生选修信息安全组所有课程，然后跨组（或跨专业）选修课程，共选修 8 门课程，总计 24 学分。课程及分组如下：

编码	课程名称	学分	备注
CS06180	信息系统安全	3	信息安全组
CS06181	信息隐藏	3	
CS06182	软件安全	3	
CS06183	信息安全工程	3	
CS06184	可信计算系统	3	
CS06185	信息内容安全	3	
CS06186	涉密信息系统管理	3	保密技术组
CS06177	保密技术基础	3	
CS04019	保密管理概论	3	
CS06188	保密法	3	
CS06012	保密史与保密制度	3	信息系统组（其中“机器学习”为“数据挖掘”与“生物信息学”的先修课程）
CS06189	机器学习	3	
CS06124	数据挖掘	3	
CS06065	生物信息学	3	

注：1) 鼓励学生自主选修本专业或跨专业选修类课程，学分不少于应选学分的 50%。

2) 在读期间参加学科竞赛或公开发表学术论文等经学院认定（详见《湖南大学信息科学与工程学院学术研究成果分类指导意见和技术创新成果指导意见》）可以申请替代选修 2 学分。

(六) 集中实践环节 (33 学分)

课程编码	课程名称	学分	备注
GE01040	军训、军事与国防 (含军事理论)	0	
CS10018	入学教育与专业入门	0	
GE09030	中文写作实训	1	一年级夏季学期
GE09028	英文写作实训	1	
GE09001	程序设计	2	
CS10019	电子系统设计	2	二年级夏季学期
CS10020	软件设计	2	
CS10021 (22)	专业综合设计 (二选一): 1. 安全网络协议栈的设计与实现; 2. 涉密信息系统设计与实现	4	三年级夏季学期
CS10023	毕业实习	2	第 8 学期
CS10024	数据库系统设计	2	
CS10025	安全系统设计	3	特色实践课程
CS10026	毕业设计 (含导师课程)	14	包含 2 个学分的导师课程。导师课程是“导师制”的具体任务,本课程须是以项目驱动、“CDIO”模式、讨论方式教学,每岗每届指导学生共 3—6 人。课程内容包含:本科生学业指导、一年级与二年级学生夏季学期设计课程监管、三年级学生夏季学期设计课程指导、四年级本科生毕业实习与毕业设计指导。

六、课程责任教师一览表

序号	姓名	职称	学历学位	专业特长	课程 (专业核心、专业选修、通识选修)
1	廖波	教授	博士	信息系统	离散数学
2	彭飞	教授	博士	信息安全、保密技术	保密技术基础
3	王树林	教授	博士	生物信息处理	生物信息学
4	胡玉鹏	副教授	博士	信息安全	网络安全、可信计算系统
5	彭黎	副教授	博士	保密管理	保密管理概论、涉密信息系统管理
6	孙建华	副教授	博士	信息安全、保密技术	网络安全
7	胡峰松	副教授	博士	信息安全	操作系统、软件安全
8	吴蓉晖	副教授	博士	信息系统	离散数学
9	陈湘涛	副教授	博士	信息安全	数据库系统、数据挖掘
10	罗纲	副教授	博士	信息安全、保密技术	信息安全数学基础、信息隐藏
11	刘玉玲	助理教授	博士	信息安全、保密技术	保密技术基础,信息内容安全
12	肖晟	助理教授	博士	信息安全、保密技术	计算机网络
13	张伟	助理教授	博士	信息系统	算法设计与分析
14	卢新国	助理教授	博士	信息系统	算法设计与分析
15	杨秋伟	助理教授	博士	信息安全、保密技术	密码学
16	刘彩苹	助理教授	博士	信息安全	计算机网络,信息安全工程
17	欧博	助理教授	博士	信息安全、保密技术	密码学、保密史与保密制度
18	曹智	助理教授	博士	信息系统,生物计算	离散数学、机器学习
19	陈佐	助理教授	博士	信息安全	操作系统、信息系统安全
20	荣辉桂	助理教授	博士	保密技术	保密管理概论
21	汤澹	助理教授	博士	信息安全	信息安全数学基础

七、专业责任教授

序号	姓名	职称	学历学位	专业特长	承担授课课程
1	廖波	教授	博士	信息系统	离散数学

Information Security

I . Objects

On the basis of “Engineering Education Certification Standards”, our target is to culture undergraduate students with the good qualities on humanity, science and engineering, as well as solid mathematical foundation on the areas of computer and information security to support their researches. We demand the students should master basic technology of cryptography, network security, information system security and information content security, should have solid theoretical knowledge on their majors, scientific ways of thinking, and technologies of engineering practice, that prompt them to make engineering innovations on their areas. Moreover, the students should possess basic theories and methods of information security, should have the abilities to research, develop and manage information security system, involving the abilities of analysis and design of information security system, safety protection, safety strategy formulation, engineer development and management of operation and maintenance. Finally, we need the students to master at least one foreign language, have an international vision, and know the international forefront on the field of the information security, that will help them to make a cooperation with international partners.

II . Basic Requirements

The undergraduate students of the information security should have the following qualities and abilities:

The graduates of Information Security should meet the following requirements:

1. Engineering knowledge: students should master the knowledge about the mathematics, life science, engineering and computer science, which can be applied to solve some complex engineering problems of information system security.

2. Analyzing problem: Based on applying the basic principles of mathematics, life science and engineering science, students should be able to recognize, express, and analyze complicate engineering problems of information system security to obtain valid conclusions through the literature researching.

3. Designing/developing solutions: For complicate engineering problems of information system security, students should be able to design solutions. They also need design information systems, units (components) or technological processing to meet specific security requirements. The consciousness of innovation and the factors of society, health, safety, law, culture and environment should be paid due attention in the design processing considering as well.

4. Researching: based on scientific principles and adopting scientific method for complex engineering problems of information systems security, students can do some research such as: designing experiments, analyzing and interpreting data, and getting the reasonable and effective conclusion through comprehensive information.

5. Using modern tools: for complex engineering problems of information system, students should be able to develop, select and use appropriate technology, resources, modern engineering tools

and information technology tools which can be used to predict and simulate the complex engineering problems, and understand the limitations.

6. **Engineering and society:** based on the engineering background, students can carry on reasonable analysis, evaluate the influence to society, health, safety, law, and culture which is aroused by the security engineering practice of cyberspace and complex engineering solutions of information system to problems, and understand the corresponding responsibility.

7. **Environment and sustainable development:** students can understand and evaluate the influence to the security of information system security for environment and sustainable development that may be caused by engineering practice of complex engineering problems.

8. **Professional norms:** everyone should not only acquire the humanities and social science literacy, social responsibility, but also be able to understand and comply with engineering professional ethics and norms, fulfill the responsibility in the information system security engineering practice.

9. **The relationship of individuals and team:** students need to play well the role of the individuals, team members and sometimes even leaders in the group under the background of multidisciplinary.

10. **Communication:** students should cultivate the ability to communicate effectively with the industry peers and the social public about information system security complex engineering problems, but also the ability of writing reports and designing documents, presenting speech with clear expression or quick respond to commands. One step further, they should have a international horizon, even under the background of cross-cultural communication and communication

11. **The capacity of project management:** students should understand and grasp the principle of engineering management and the method of economic decision-making, applied in a multidisciplinary environment.

12. **Lifetime learning:** students should not only cultivate the awareness of self-directed learning and keep learning throughout their life, but also have the ability of constant learning so as to adapt to the development of the society.

III. Program Traits

This major belongs to the information security major in the undergraduate major directory from the Ministry of Education. The cultivation program is formulated according to the criterion of professional computer and engineering requirements as well as considering the actual environments of our school. We demand our students have a core foundation on the knowledge from information security majors, emphasize their engineering practices on the information security, and train their abilities on scientific researches and technological innovations. We also strengthen the interdisciplinary and international exchange, highlight some research directions such as computer system security, network security, information content security and information mining and so on.

IV. Degree Requirements

1. An undergraduate student is expected to graduate in four (4) years preferably, and is also allowed to graduate within the periods between three (3) to six (6) years according to the student's performance in the academic credit system.

2. The minimal requirement for the academic credits is 165 credits totally for the students from the information security major. The detailed requirements for each kind of the specific courses are listed in the following table:

Course Categories	Core Courses General	Core Courses Domain	Core Courses Discipline	Core Courses Major	Electives Major	Electives General	Collective Training	Total
Credit requirements	24	24	28	13	35	8	33	165

3. A student can graduate if he/she fulfills the course study of core courses, electives, and other courses as specified in the program, and satisfies the basic requirements on morality, intelligence, and health. We will confer the Bachelor Degree of Engineering on students if they satisfy the requirements of degree according to the related policies.

V. Curriculum

1. General Education Courses [required 24+(6) + elective 8 credits]

The general education courses consist of required courses and elective courses. General education electives are designed according to the *Curriculum Design of General Education Electives of Hunan University*. Required general education courses are illustrated in the following table.

Code	Course Title	Credit(s)	Remarks
GE01101	Introduction to Maoism and Theoretical System of Socialism with Chinese Characteristics	3+(3)	
GE01039	Moral Cultivation and Law Basics	1.5+(1.5)	
GE01100	Current Situation and Policies	0.5+(1.5)	
GE01102	Outline of Modern Chinese History	2	
GE01103	Fundamentals of Marxism I	2	
GE01104	Fundamentals of Marxism II	2	
GE01012(-15)	College English	8	
GE01107(-13)	Psychological Health & Career Planning	1	
GE01089(-92)	Physical Education	4	

2. Core courses; domain (24 credits)

Code	Course Name	Credit(s)	Remarks
GE03025	Advanced Mathematics A(I)	5	
GE03025	Advanced Mathematics A(II)	5	
GE03003	Linear Algebra A	3	
GE03004	Probability Theory and Statistics A	3	
GE03005	General Physics A(I)	3	
GE03006	General Physics A(II)	3	
GE03007	General Physics lab A(I)	1	
GE03008	General Physics lab A(II)	1	

3. Core courses; discipline (28 credits)

Code	Course Name	Credit(s)	Remarks
CS04022	Advanced Programming	4	
CS04001	Discrete Mathematics	4	
CS05054	Digital Circuit and Logic Design	4	
CS04023	Computer System	4	
CS04002	Data Structure	4	
CS04007	Operating System	4	
CS04021	Programming Experiment	2	
CS04024	Digital System Experiment	1	
CS04026	Network System Experiment	1	

4. Core courses: major (13 credits)

Code	Course Name	Credit(s)	Remarks
CS05081	Algorithm Design and Analysis	4	
CS05082	Computer Network	4	
CS05083	Database System	4	
CS05084	Security System Experiment	1	

5. Electives: major (35 credits)

(1) Major restricted electives(11 credits)

In order to strengthen the knowledge base, students in the information security major are required to take these electives, for a total of 11 credits

Code	Course Name	Credit(s)	Remarks
CS06177	Information Security Mathematics Foundation	3	
CS06178	Cryptography	4	
CS06179	Network Security	4	

(2) Major non-restricted electives(24 credits)

Major non-restricted electives are implemented as groups. Students of the information security major should take all the courses in the information security group and then take courses from other groups or even from other majors, with a total of eight (8) non-restricted electives and 24 credits at least. These selection strategy will help students cultivate their abilities in professional systems and expand their professional knowledge and skills. The non-restricted electives and their groups are listed in the following table:

Code	Course Name	Credit(s)	Remarks
CS06180	Information System Security	3	Information security group
CS06181	Information Hiding	3	
CS06182	Software Security	3	
CS06183	Information Security Engineering	3	
CS06184	Trusted Computing System	3	
CS06185	Information Content Security	3	
CS06186	The Classified Information System Management	3	Secrecy technology group
CS06177	Secrecy Technology Foundation	3	
CS04019	Introduction to Secrecy Management	3	
CS06188	Secrecy Law	3	
CS06012	Secrecy History and Secrecy System	3	Information system group (Machine learning is the first course of Data mining and Biological information science)
CS06189	Machine Learning	3	
CS06124	Data Mining	3	
CS06065	Biological Information Science	3	

Note: 1) Students are encouraged to sign up for elective within and across their majors, with the credit hours no less than 50% of the total required credit hours.

2) Students who take part in computer competitions or publish technical papers can apply to substitute two selective credit hours (see instructions of academic research and techniques invocation of the college of computer science and electronic engineering, hunan university).

6. Collective training (33 credits)

Code	Course Name	Credit(s)	Remarks
GE01040	Military Training, Military Affairs and National Defense (including Military Theory)	0	
CS10018	University and “the Information Security” Major Introduction	0	
GE09030	Practices for Chinese Writing	1	Summer semester of the first year of study
GE09028	Practices for English Writing	1	
GE09001	Practices for Programming	2	
CS10019	Practices for Digital Systems Design	2	Summer semester of the second year of study
CS10020	Practices for Software Design	2	
CS10021(22)	Major Specific Integrated Design (Choosing 1 Project from the College's list): 1. Design and Implementation of Security Network Protocol Stack. 2. Design and Implementation of Classified Information System.	4	Summer semester of the third year of study
CS10023	Internship for Graduation Project	2	Spring semester of the fourth year of study
CS10024	Database System Design	2	
CS10025	Security System Design	3	Major specific practices
CS10026	Graduation Project(including Mentor Courses)	14	Mentor courses (2 credits) are included. Mentor courses are the tasks of the mentor system. These courses are project-driven with “CDIO” model, and are taught by discussions. Every mentor takes charge of 3—6 students of each class year. The course contents include: academic guidance for undergraduate students, monitoring on summer semester design courses for first and second year undergraduate students, mentoring on summer semester design courses for third year undergraduate students, mentoring on graduation project and internship for fourth (final) year undergraduate students.

VI. Major Course Teachers

No.	Name	Title	Education	Research Domain	Courses
1	Liao bo	Professor	Ph. D	Information System	Discrete Mathematics
2	Peng Fei	Professor	Ph. D	Information Security, Secrecy Technology	Secrecy Technology Foundation
3	Wang Shulin	Professor	Ph. D	Biological Information Processing	Biological Information Science
4	Hu Yupeng	Associate Professor	Ph. D	Information Security	Network Security, Trusted Computing System
5	Peng Li	Associate Professor	Ph. D	Confidential Management	Introduction to Secrecy Management, Classified Information System Management
6	Sun Jianhua	Associate Professor	Ph. D	Information Security, Secrecy Technology	Network Security
7	Hu Fengsong	Associate Professor	Ph. D	Information Security	Operating System, Software Security
8	Wu Ronghui	Associate Professor	Ph. D	Information System	Discrete Mathematics
9	Chen Xiangtao	Associate Professor	Ph. D	Information Security	Database System, Data Mining
10	Luo Gang	Associate Professor	Ph. D	Information Security, Secrecy Technology	Information Security Mathematics Foundation, Information Hiding
11	Liu Yuling	Assistant Professor	Ph. D	Information Security, Secrecy Technology	Secrecy Technology Foundation, Information Content Security
12	Xiao Sheng	Assistant Professor	Ph. D	Information Security, Secrecy Technology	Computer Network
13	Zhang Wei	Assistant Professor	Ph. D	Information System	Algorithm Design and Analysis
14	Lu Xinguo	Assistant Professor	Ph. D	Information System	Algorithm Design and Analysis
15	Yang Qiuwei	Assistant Professor	Ph. D	Information Security, Secrecy Technology	Cryptography
16	Liu Caiping	Assistant Professor	Ph. D	Information Security	Computer Network, Information Security Engineering
17	Ou Bo	Assistant Professor	Ph. D	Information Security, Secrecy Technology	Cryptography, Secrecy History and Secrecy System
18	Cao Zhi	Assistant Professor	Ph. D	Information System, Biocomputing	Discrete Mathematics, Machine Learning
19	Chen Zuo	Assistant Professor	Ph. D	Information Security	Operating System, Information System Security
20	Rong Huigui	Assistant Professor	Ph. D	Secrecy Technology	Introduction to Secrecy Management
21	Tang Dan	Assistant Professor	Ph. D	Information Security	Information Security Mathematics Foundation

VII. Professors-in-charge

No.	Name	Title	Education	Research Domain	Courses
1	Liao bo	Professor	Ph. D	Information System	Discrete Mathematics

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