

网络空间安全留学研究生培养方案

Postgraduate Programs for International Students Majoring in Cyberspace Security

(专业代码: 0839)

(Subject code: 0839)

本培养方案依据《中国科学技术大学研究生培养方案总则(2019版)》以及《中国科学技术大学研究生院关于开展科学学位研究生培养方案修订(制定)工作的通知》以及《网络空间安全研究生培养方案(2020年版)》修订。

The program is revised in accordance with *The General Principles for Postgraduate Cultivation Program of University of science and technology of China (2019)*, *the Notice of Graduate School of USTC on Revising (formulating) the Cultivation Program for Postgraduates with Science Degree* and *The Cultivation Program for Postgraduates Majoring in Cyberspace Security (2020)*.

一、培养目标

I. Program objectives

本学科旨在培养具有坚实系统的网络空间安全理论基础和专门知识、富有创新精神、能够适应各国经济、科技、教育发展需要的高水平人才。基本要求为:

This discipline aims to cultivate high-level talents with solid and systematic theoretical foundation and specialized knowledge in Cyberspace Security, having innovative spirit, and able to meet the needs of economic, scientific and educational development of various countries. The basic requirements are as follows:

(一) 攻读硕士学位的留学生应掌握本学科坚实的基础理论和系统的专业知识，具有从事科学研究工作或较强的实际工作能力；

(1) International students studying for a master's degree should master solid basic theories and systematic professional knowledge of the discipline, and have strong ability to engage themselves in scientific research or practical work;

(二) 攻读博士学位的留学生应掌握本学科坚实宽广的基础理论和系统深入的专业知识，掌握科学研究的基本技能和方法，了解所从事研究方向的国内外发展动态，具有独立从事科学研究和独立担负专门技术工作的能力，在科学或专门技术上能做出创造性的成果。

International students studying for a doctoral degree should master the solid basic theory and systematic professional knowledge, master the basic skills and methods of scientific research, understand the international development tendency of the research direction, have the ability of independent engagement in scientific research and specialized technical work, and be able to make creative achievements on the scientific or technical expertise.

二、主要研究方向

主要研究方向包括：

II. Main research fields:

1. 密码学

Cryptography

2. 计算机系统安全

Computer system security

3. 网络安全及应用安全

Networking security and application security

4. 量子信息安全

Quantum information security

5. 组合网络

Combination system

三、课程类型和学分要求

III. Course type and credit point requirements

1. 公共必修课类型及学分要求：按照国际学院有关规定执行，具体要求请参照附件。

1.Types and credit point requirements of public compulsory courses: They shall be implemented in accordance with relevant regulations of International College. Please refer to the attachment for specific requirements.

2. 专业课程类型及学分要求：

2.Types of specialized courses and credit points requirements:

1) 硕士培养模式。通过硕士留学生资格审查和招生面试，取得我校硕士研究生资格者。留学生在申请硕士学位时，除满足公共必修课的学分要求外，取得的专业总学分不低于28学分，其中硕士学科基础课不少于6学分，硕士专业基础不少于6学分，开题报告2学分。

Master's program: Applicants are supposed to pass the qualification examination of international master students and the recruitment interview and obtain the qualification for master's degree of our university. For master's degree application, the total credit point obtained in major study shall not be less than 28 credit points in addition to meeting the credit points requirements of public compulsory courses. The credit points of master's basic courses are no less than 6 credit points and that of master's specialized courses are no less than 6 credit points, and the master's research proposal counts for 2 credit points.

2) 博士培养模式。已取得硕士学位，通过我校博士留学生资格审查

和招生面试，取得我校博士研究生资格者。留学生在申请博士学位时，除满足公共必修课的学分要求外，取得的专业总学分不低于8学分，其中博士专业课不少于4学分，开题报告2学分。

Doctoral program: Applicants are supposed to have obtained a master's degree, pass the examination of doctoral qualification and the recruitment interview of the university to obtain the qualification for doctoral program. In application for the doctoral degree, in addition to meeting the requirements of public compulsory courses, the total credit points obtained in major study shall not be less than 8 credit points. The doctoral specialized course credit points are no less than 4 credit points, and the doctoral research proposal counts for 2 credit points.

四、研究生培养过程要求

IV. Requirements for postgraduate training

1. 开题报告：

1. Research proposal:

博士学位论文的开题报告及评审是博士研究生培养的必要环节。开题报告的时间由博士生导师根据博士生工作进度情况确定，一般应在博士培养阶段的第三或第四学期内完成；开题报告由博士生所在一级学科组织；博士学位论文开题报告评审小组由本学科及相关学科的专家组成，人数不少于 5 人（其中具有正高级职称的博士生导师不少于 3 人）；达到或超过三分之二的评审专家同意通过的方可通过；开题报告不通过的博士研究生可以申请在下一学期重新开题。

The research proposal and the review of the dissertation of doctoral students is a necessary part of PhD. education. The time of the research proposal is determined by the supervisor of doctoral students according to the progress of their work. The doctoral degree should normally be completed within the third or fourth semester of the PhD. education. The first-level discipline is

responsible for the research proposal. The review group of the research proposal of the doctoral dissertation shall be composed of experts of the same discipline or related disciplines and it shall consist of at least five experts (including at least three doctoral supervisors with senior professional title). Research proposal shall be adopted only if it is approved of by two thirds or more of the experts. Those doctoral students who fail to pass the research proposal could apply the second time in the next semester.

硕士学位论文的开题报告及评审是硕士研究生培养的必要环节。开题报告的时间由硕士生导师根据硕士生工作进度情况确定，一般应在硕士培养阶段的第三或第四学期内完成；开题报告由硕士生所在一级学科组织；硕士学位论文开题报告评审小组由本学科及相关学科的专家组成，人数不少于 3 人（其中具有正高级职称的硕士生导师不少于 1 人）；达到或超过三分之二的评审专家同意通过的方可通过；开题报告不通过的硕士研究生可以申请在下一学期重新开题。

The research proposal and the review of the dissertation of postgraduates is a necessary part of postgraduate education. The time of the research proposal is determined by the supervisor of master students according to the progress of their work. The master degree should normally be completed within the third or fourth semester of the master's education. The first-level discipline is responsible for the research proposal; The review group of the research proposal of the postgraduates' dissertation shall be composed of experts of the same discipline or related disciplines and it shall consist of at least three persons (including no less than 1 master supervisor with a senior professional title). Research proposal shall be adopted only if it is approved of by two thirds or more of the experts. Those postgraduate students who fail to pass the research proposal could apply the second time in the next semester.

2. 中期检查：博士/硕士学位论文的中期检查及评审是博士/硕士研究生培养的必要环节。中期检查最早在研究生通过开题报告之后的下一学期内进行；中期检查及评审由研究生所在一级学科组织；中期检查报告评审小组的组成及通过办法同开题报告；中期检查不通过的研究生可以申请在下一学期再次进行中期检查。

2.Mid-term inspection: The mid-term inspection and the evaluation of doctoral or master's dissertation are necessary in the cultivation of doctoral or master students. The mid-term inspection is carried out in the first semester after the graduate students pass the research proposal. The first-level discipline is responsible for the mid-term inspection report and evaluation. The composition of the review group of the mid-term inspection report of the doctoral dissertation and the approval standard are the same as those of the research proposal; Postgraduates who do not pass the mid-term inspection could apply for the second mid-term inspection in the next semester.

3. 毕业答辩：博士/硕士学位论文的毕业答辩应在研究生通过中期检查之后进行；具体要求参见研究生院的相关规定。

3.Graduation defense: The graduation defense of doctoral or master's dissertation should be conducted after the graduate students pass the research proposal; For specific requirements, please refer to the relevant regulations of Graduate School.

4. 国际学术交流：博士生在学期间须参加一次国际学术会议并交流学术论文，或短期出境访学一次。国际学术会议和短期出境访学后，博士生应及时向所在系教学办公室提交有关证明材料。

4.International Academic Exchanges: International doctoral students are required to attend an international academic conference and exchange academic papers, or go abroad for a short-term study visit. After finishing

these activities, they should submit relevant supporting documents to the teaching secretary of their department in time.

5. 学术报告：博士生/硕士生在学习期间必须听取不少于 15 场次的学术报告会，并得到报告会组织单位的认定。累计 15 次有效报告记录可以计 1 学分。

5.Academic lectures: International doctoral or master students must participate in at least 15 academic lectures during their studies and be recognized by the organization of the lectures. 1 credit point can be counted if the total number of valid report records is more than 15.

五、选课要求和课程设置列表

V. Course selection requirements and course lists

1. 公共必修课由国际学院统一设置和要求。

1.Public compulsory courses are uniformly set and required by International College.

2. 超出学分要求的基础课，学生可以申请调整为专业选修课。

2. For basic courses that beyond the credit point requirements, students can apply for turning them into specialized elective courses.

3. 研究生中途由其他专业转入本专业的，应按照本专业课程要求补修课程，已修课程符合本专业要求的，经本专业相应课程任课老师认定，可以计入学位课程学分。

3. If a postgraduate student transfers from another major to his present one, the additional courses shall be taken according to the course requirements of the new major. If the completed courses meet the requirements of the new major, with the approval of the corresponding course's teachers, they can be

included in the credit points of the degree courses.

4. 研究生选修本专业培养方案以外的研究生课程，经导师签字同意，可以算作本专业的专业选修课。

4. With the signature of their supervisors, postgraduate courses that those students take outside their cultivation program could be included in specialized elective courses for their major.

5. 研究生补修本专业培养方案以外的本科生课程，所获学分不计入学位课程学分。

5. Credit points obtained by postgraduate students in supplementary undergraduate courses will not be counted as credit points for degree courses.

6. 本专业课程设置列表如下：

6. The course list of this major is as follows:

课程类型 Course types	课程代码 Code	课程名称 Name	学分 Credit Point	备注 Note
硕士学科基础课 Basic courses for master students	INFO6101P	矩阵分析与应用 Matrix Analysis and Applications	3	
	COMP6001P	算法设计与分析 Design and Analysis of Algorithms	3	
	CONT6105P	最优化理论 Optimization Theory	3	
	PHYS5251P	量子信息导论 Introduction to Quantum Information	4	
	MATH5012P	代数数论 Algebraic Number Theory	4	
	MATH5006P	图论 Graph Theory	4	
硕士专业基	CYSC6201P	现代密码学	3	必修

础课 Specialized basic courses for master students		Modern Cryptography		Compulsory course
	COMP6112P	计算数论 Computational Number Theory	3	
	CYSC6202P	通信网络的安全理论与技 术 Security Theory and Technology of Communication Network	3	
	COMP6103P	高级计算机网络 Advanced Computer Networking	3	
	PHYS6251P	量子光学 Quantum Optics	4	
硕士专业选 修课 Specialized elective courses for master students	CYSC6401P	密码分析学 Cryptanalysis	2	
	CYSC6402P	云计算中的网络技术 Networking Technologies in Cloud Computing	2.5	
	INFO5301P	信息论 A Information Theory A	3	
	INFO6402P	多媒体通信 Multimedia Communications	2.5	
	INFO6412P	信息检索与数据挖掘 Information Retrieval and Data Mining	3	
	MATH6112P	代数图论 Algebraic Graph Theory	4	
	MATH6422P	计算代数几何 Computational Algebraic Geometry	4	
	MATH5011P	交换代数 Commutative Algebra	4	
	CONT6103P	随机过程理论 Stochastic Process Theory	4	
	COMP6104P	高级操作系统 Advanced Operating System	3	
	COMP6219P	大数据隐私 Privacy Issues in Big Data	3	
	COMP6216P	网络安全 Network Security	3	

	COMP6110P	机器学习与知识发现 Machine Learning and Knowledge Discovery	3.5	
	PHYS5253P	量子信息技术 Technique of Quantum Information	3	
	ELEC6402P	嵌入式系统原理及应用 Theory and Application of Embedded Systems	4	
	CYSC6403P	先进无线感知与安全 Advanced Wireless Sensing and Security	2	
博士专业课 Doctoral specialized courses	CONT7101P	信息科学的数学理论 Mathematics Theory of Information Science	2	
	MSAE5003P	博弈论 Game Theory	3	
	MATH7408P	数论选讲 Topics in Number Theory	4	
	MATH7425P	图论选讲 Selected topics in Graph Theory	4	
	MATH7426P	组合选讲 Selected topics in Combinatorics	4	
	COMP7203P	网络计算与高效算法 Network Computing and Efficient Algorithms	3	
	COMP7204P	机器学习与数据挖掘前沿 Frontiers of Machine Learning and Data Mining	3	
	PHYS7652P	高等量子光学 Advanced quantum optics	4	
	CYSC7401P	网络空间安全专题 Selected Topics on Cyberspace Security	2	必修 Compulsory course

附件

Appendix

留学生公共必修课类型及学分要求

Types and credit requirements of public compulsory courses for international students

2018年秋季学期及之前入学的攻读硕士和博士学位的留学研究生的公共必修课为汉语和中国概况课程，其中CAS-WAS奖学金（包括CAS-WAS“一带一路”奖学金）：《综合汉语》4学分；《汉语听说》2学分；《中国概况》4学分，共10学分，每门75分及格。其他奖学金（包括CSC奖学金、USTC奖学金）：《基础汉语》2学分；《中国概况》4学分，共6学分，每门75分及格。

Chinese language and China Panorama courses are the public compulsory courses for international graduate students for master's or doctoral degrees who were enrolled in the autumn semester of 2018 and before. For the CAS-WAS scholarship recipients (including CAS-WAS "Belt and Road" scholarship recipients), the credit settings are as follows: *Comprehensive Chinese* (4 Credit Points); *Chinese Listening and Speaking* (2 Credit Points); *China Panorama* (4 Credit Points), 10 Credit Points in total, 75 or more (≥ 75) for each pass. For other scholarship recipients (including CSC scholarship recipients and USTC scholarship recipients), the credit settings are as follows: *Basic Chinese* (2 Credit Points); *China Panorama* (4 Credit Points), 6 Credit Points in total, 75 or more (≥ 75) for each pass

2019年秋季学期及之后入学的攻读硕士和博士学位的留学研究生的公共必修课是汉语和中国概况课程，由国际学院在每年秋季学期集中开设，并负责课程管理。根据国际研究生录取时确定的专业教学语言，公共必修课设置如下：

Chinese language and China Panorama are the public compulsory courses for international graduate students studying for master's or doctoral degrees

who were enrolled in the autumn semester of 2019 and after. The courses are offered and administrated by International College in the autumn semester each year. According to their major's teaching language chosen by international graduate students, the public compulsory courses settings are as follows:

1) 以中文为专业教学语言的留学研究生，公共必修课包括：

《高级汉语》，4 学分；《中国概况》，4 学分；共计 8 学分，原则上应在入学后第一学期完成。毕业时汉语水平应达到 HSK 五级，并取得相应证书。

1) For international graduate students who choose Chinese as their major's teaching language, the public compulsory courses include:

Advanced Chinese (4 Credit Points); *China Panorama* (4 Credit Points). A total of 8 Credit Points should be obtained in the first semester after admission in principle. Upon graduation, students should attain HSK Level-5 and obtain its certificate.

2) 以英语为专业教学语言的国际研究生，公共必修课包括：

《综合汉语》，2 学分；《汉语听说》，2 学分；《中国概况》，4 学分；共计 8 学分，原则上应在入学后第一学期完成，毕业时汉语水平应达到 HSK 三级，并取得相应证书。

2) For international graduate students who choose English as their major's teaching language, the public compulsory courses include:

Comprehensive Chinese (2 Credit Points); *Chinese Listening and Speaking* (2 Credit Points); *China Panorama* (4 Credit Points). A total of 8 Credit Points should be obtained in the first semester after admission in principle. Upon graduation, students should attain HSK Level-3 and obtain its certificate.