

控制科学与工程学科博士研究生（留学生）培养方案

一、学科简介

控制科学与工程包含控制理论与控制工程、检测技术与自动化装置、模式识别与智能系统、系统工程等 4 个二级学科。其中控制理论与控制工程学科是四川省优势学科。在辐射环境机器人技术及装置、检测技术及应用方向上拥有跟踪国际先进研究水平的科研平台和实力。此外，在控制工程与智能系统、网络传输与组网控制方向上也具有雄厚的科研实力和广泛的学术影响。

二、培养目标

外国留学生博士学位获得者应具有一定的汉语听、说、读、写能力，对学科研究前沿和发展趋势有系统深入的了解，在控制科学与工程学科方面有坚实宽广的理论基础和系统深入的专门知识，具有独立完成本学科相关实验研究与工程实践能力。能应用英语或者汉语撰写高水平学术论文，并能在国际会议上进行交流。能独立从事科学研究，承担相关的研究和开发课题，具备成为学术带头人或项目负责人的素质，能胜任在科研单位、产业部门或高等院校有关方面的研究、科研开发、教学或技术管理工作。

三、研究方向

1. 控制工程与智能系统
2. 辐射环境机器人技术与装置
3. 检测技术及应用
4. 复杂系统与组网控制

四、学习年限

攻读博士学位者，学习年限为 3-6 年。若因客观原因不能按时完成学业者，可申请延长学习年限，但最长学习年限不超过 6 年。

五、培养方式与课程学习要求

外国留学生（博士研究生）培养方式：

1. 脱产培养。整个培养过程均在我校完成；
2. 在职培养。课程学习在我校完成，论文工作可在留学生本国完成，但在我校从事论文研究的时间累计不得少于一年。两种培养方式的论文答辩均须在我校完成。

外国留学生（博士研究生）培养实行导师负责制。导师负责指导研究生制定个人培养计划、选课、开展学位论文工作。

总学分要求不低于 14 学分，课程总学分不低于 12 学分，其中学位课不低于 8 学分；必修环节不低于 2 学分。课程学习期间，应通过本专业规定的学位课程考试，以及其他选修课程的考试或考查。学位课中，公共基础课为必修课，基础课至少选修一门。允许在导师指导下跨学科选修 1-2 门学位课作为本学科的学位课。学位课可代替非学位课，但非学位课不能替代学位课。有汉语基础者，可申请选修面向学校全日制研究生用中文讲授的博士阶段专业课程，通过者获得相应学分。

未完成课程学习的学分要求者，不能申请参加论文答辩。

六、课程设置

课程类别		课程编号	课程名称	学时	学分	开课学期	备注
学	公共基础课		中国文化概论	48	3.0	1	

位 课	专业 基础课	920101	系统辨识与建模☆	48	3.0	1	
		920102	高级人工智能☆	48	3.0	1	
非学 位选 修课	专业 选修课	920103	先进模式识别☆	48	3.0	1	三选一
		920104	先进机器人技术及应用☆	48	3.0	1	
		920105	现代信号处理☆	48	3.0	1	
必修环节			素质教育选修课		1.0		
			学术活动		1.0		
			综合考试		1.0		
			开题报告与文献阅读		1.0		

说明：☆课程表示采用英语授课。

七、必修环节

来华留学博士研究生必修环节包含四大部分，要求外国留学生（博士研究生）分别完成以下内容：

1. 素质教育选修课：以介绍学术前沿知识、中外文化和艺术等为主，加强外国留学生（博士研究生）综合素质教育，研究生可选修一门，考核通过后获 1 个学分。

2. 学术活动：为进一步活跃学术气氛并拓宽外国留学生（博士研究生）的知识面，博士研究生应广泛参加学术活动，在校期间须参加 10 次以上校内外学术报告会，填写学术活动登记表，有举办学术活动单位的公章为依据，报所在学院研究生管理部门备案，全部完成后获得 1 学分。

3. 外国留学生（博士研究生）综合考试是博士生修完课程后进行的、主要考查外国留学生（博士研究生）有关基础理论和专业知识的综合考试，同时适当检查外国留学生（博士研究生）对所研究方向及有关领域前沿动态的掌握程度。综合考试采用笔试和口试相结合的方式，以百分制评定成绩。其中笔试成绩所占比例不得低于 50%。每年集中举行两次综合考试，时间定在每年的四月和十月。综合考试的试题、试卷、口试记录及评语等由所在学院研究生秘书收齐后，与成绩一并报研究生院教学管理科备案保存。

(1) 外国留学生（博士研究生）一般应于入学一年后参加一次综合考试。综合考试未通过者，允许在下一年参加一次补考，补考仍未通过者，不得参加论文答辩，作退学处理。

(2) 外国留学生（博士研究生）综合考试由学位评定分委员会制定三名专家组成的考试委员会负责实施。考试委员会主席必须由教授担任，考试委员会其他成员必须由副教授以上职称的专家担任。

4. 论文开题报告及文献阅读综述：指外国留学生（博士研究生）在学位论文开题之前，要求阅读本学科前沿的文献 60 篇以上，其中近 5 年的文献 30 篇以上，并写出 15000 字左右的开题报告，并完成相应的开题报告环节。

八、学位论文

（一）基本要求

外国留学生（博士研究生）学位论文的选题应属学科前沿或对科技和社会发展具有重要的理论意义或实用价值。学位论文应表明作者在本学科掌握了坚实宽广的基础理论和系统深入的专门知识，具有独立从事科学研究工作或担负专门技术工作的能力，在科学或专门技术上做出创造性的成果。

（二）学位论文工作

外国留学生（博士研究生）在导师指导下确定选题后，开展学位论文工作。

1. 开题报告

(1) 开题报告的时间。博士生在确定选题，大量阅读文献的基础上，一般应在入学

的第三学期期末之前，最迟应在第四学期期末之前完成开题报告。

(2) 开题报告的方式。开题报告应以报告会的形式，在学院的学术交流论坛公开举行；开题报告专家委员会至少由本学科及相近学科 3 位教授或具有博士学位的副教授组成，导师可以作为其中一位专家。

(3) 开题报告的内容。依据《开题报告表》的要求，做开题报告。在开题报告会中，及时完成《开题报告表》，交学院研究生科保存，以备检查。

(4) 若开题报告没能通过，在导师的指导下 3 个月后才能重新申请开题。2 次开题报告不过者，应终止外国留学生（博士研究生）学业（做退学处理）。

(5) 若因正当原因改变选题，须按上述要求重新开始做开题报告。

(6) 论文开题通过 1 年后方能申请学位论文中期考评。

2. 论文工作

外国留学生（博士研究生）在导师指导下按计划进行学位论文工作。论文的工作时间一般不少于两年。

3. 中期考评

学位论文开题一年后，外国留学生（博士研究生）向学院组织的考评小组汇报论文工作进展情况报告，考评小组至少由本学科及相近学科的 3 位专家组成，导师可以作为其中 1 位专家，另 2 位专家可以是教授或具有博士学位的副教授组成。考评小组对外国留学生（博士研究生）论文工作进行认真审查，并将考评意见填入《中期考评表》，对未按论文工作计划完成阶段工作的外国留学生（博士研究生）要有明确的处理意见。《中期考评表》交各学院研究生科保存，以备检查。

4. 学位论文的撰写

外国留学生（博士研究生）学位论文应在导师（或导师小组）的指导上，由外国留学生（博士研究生）独立完成，且必须是一篇系统的、完整的学术论文。多人合作的课题应明确区分本人所做的工作，共同部分应加以说明。

学位论文可用中文或英文撰写，应有 1500 字左右的中英文摘要。撰写格式参照《西南科技大学研究生学位论文撰写规范》执行。

(三) 学位论文的答辩申请、评阅、答辩与学位授予，参照《西南科技大学授予外国留学生硕士、博士学位工作细则（试行）》的规定执行。

外国留学生（博士研究生）学位论文的选题应属学科前沿或对科技和社会发展具有重要的理论意义或实用价值。学位论文应表明作者在本学科掌握了坚实宽广的基础理论和系统深入的专门知识，具有独立从事科学研究工作或担负专门技术工作的能力，在科学或专门技术上做出创造性的成果。

九、成果要求

外国留学生（博士研究生）应在本学科领域的学术期刊正刊上以第一作者身份并以西南科技大学为作者单位，公开发表不少于 3 篇与学位论文相关的学术论文，其中至少有 1 篇为 SCI 检索论文。

Program for Doctor Degree of Control Science and Engineering

1. Discipline Introduction

Control science and engineering includes four sub-disciplines—control theory and control engineering, detection technology and automatic equipment, pattern recognition and intelligent system, system engineering, among which control theory and control engineering is one of the dominant disciplines of Sichuan Province. Research in robot technology and equipment used for radiation environment, and detection technology and its application is facilitated by research team and platform with international advanced level. Besides, research in control engineering and intelligent system, and network transmission and networking control has a good academic reputation.

2. Training objectives

International doctoral students should have the capability of listening, speaking, reading and writing in Chinese, an in-depth knowledge of research frontier and trends, a solid theoretical basis and systematic in-depth expertise, and the ability of independently conducting the relevant experimental research and engineering practice. Students are required to write high-quality academic papers in English or Chinese, and communicate with international counterparts in academic conferences. Students should have the ability to conduct scientific research independently, possess the potentialities of becoming an academic leader or a project leader, and be competent for working in academia, research and industry.

3. Research areas

- 1) Control engineering and intelligent systems;
- 2) Robot technology and equipment used for radiation environment;
- 3) Detection technology and its application;
- 4) Complex systems and networking control.

4. Period of study

The period of study for doctoral students ranges from 3 to 6 years. Those who cannot complete the study due to excusable causes can apply for an extension as long as the total period of study does not exceed 6 years.

5. Training modes and requirements for courses

The training mode for international doctoral students includes full-time training and on-the-job training. For on-the-job training, students should complete the courses in the University and can complete the rest study elsewhere. For both modes, the dissertation defense should be carried out in the University.

6. Curriculum

Course Type		Course Number	Course Name	Hours	Credits	Term	Remarks
Degree Courses	Basic Courses		Introduction to Chinese Culture	48	3.0	1	
	Specialized Basic	920101	System Identification and Modeling☆	48	3.0	1	

	Courses	920102	Advanced Artificial Intelligence☆	48	3.0	1	
Non-Degree Courses	Specialized Basic Courses	920103	Advanced Pattern Recognition☆	48	3.0	1	Choose one course
		920104	Advanced Robot Technology and its Application☆	48	3.0	1	
		920105	Modern Signal Processing☆	48	3.0	1	
Required Procedures			Elective Courses of Quality Education		1.0		
			Academic Activities		1.0		
			Comprehensive Examination		1.0		
			Dissertation Proposal and Literature Reading		1.0		

Note: Courses marked with “☆” are lectured in English.

7. Required procedures

The required procedures for international doctoral students are composed of elective course of quality education, academic activities, comprehensive examination and dissertation proposal and literature reading.

1) Elective course of quality education

The elective course of quality education involves academic frontier, Chinese and foreign culture and arts. Students can take one such course and obtain 1 credit after passing the examination.

2) Academic activities

Students should attend no less than 10 academic lectures and complete the registration form required by the school administration. Students can obtain 1 credit after attending 10 lectures.

3) Comprehensive examination

Comprehensive examinations (abbreviated as CE) are conducted after students complete all coursework. The purpose of the CE is to ensure the students have a solid foundation of basic theory and expertise, and are familiar enough with their area of research to make original contributions. The CE is held both orally and in written in April and October each year, and the proportion of written examination is no less than 50%. The CE is graded by percentage points. Students should take the CE one year after admission. Those who fail the CE for the first time are allowed to take another CE, while those who fail two CEs are not qualified for further doctoral study. The CE is held by an examination committee appointed by the Academic Degrees sub-Committee of the school. The examination committee should be chaired by a professor, and the other members should be professors or associate professors. The examination papers, the answer sheets, and the records of the oral examinations and the comments are

documented by the Graduate School.

4) Dissertation proposal and literature reading

The students are required to read 60 papers before their dissertation proposal defense, among which no less than 30 were published in 5 years. The dissertation proposal should have no less than 7500 English words or 15000 Chinese words.

8. Requirements for doctoral dissertations

1) Basic requirements

Dissertation topics should focus on frontier problems or have important theoretical significance and practical value to the scientific, technological or social development. Dissertations should demonstrate that the author has a solid theoretical basis and systematic in-depth expertise, and the ability of independently conducting the relevant scientific research or technological development, and has made innovative contributions to the development of science and technology.

2) Procedures of dissertations

a) Dissertation proposals

Dissertation proposal defenses should be held generally before the third semester and no later than the fourth semester.

Dissertation proposals should be presented and peer-reviewed in public meeting. The review committee consists of three professors or associate professors. The supervisor can be one of the committee members.

After the review meeting, students should complete the Dissertation Proposal Forms and submit them to the Graduate Office of the School for further check.

Those who fail the first dissertation proposal review cannot renew the application within 3 months, while those who fail the second review are not qualified for further doctoral study.

Students should start a new application for review if they expect to change their research topics for excusable causes.

Students can apply for the mid-term evaluation one year after passing the proposal review.

b) Dissertation research

Doctoral students should carry out their research under the guidance of their supervisors for no less than two years.

c) Mid-term evaluation

Doctoral students should report the dissertation progress to the evaluation committee one year after the proposal review. The evaluation committee consists of three professors or associate professors from related disciplines. The supervisor can be one of the committee members. The evaluation committee completes the Mid-term Evaluation Form after examining the dissertation work of the students and gives suggestion for those who fall behind the schedule.

After the review meeting, students should complete the Mid-term Evaluation Forms and submit them to Graduate Office of the School for further check.

9. Achievement requirements

Doctoral students should publish three papers relevant to their dissertation topics on academic journals as the first authors and with the University as the first author affiliation. At least one

of these papers is for SCI.