

Doctoral Degree Program in Mechanics

力学学科留学博士研究生培养方案

Discipline code 一级学科代码: 0801

一、培养目标 Training Objectives

1. 在校期间严格遵守我国的法律、法规以及我校制定的各项校纪校规，具有正确的人生观、价值观和世界观。培养留学生具有端正的学习态度，了解中国，学风严谨，团结协作，学有所成，成为促进中外友好合作与交流人才。

1. During school, strictly abide by the laws and regulations of our country and various school discipline regulations established by our school. Have a correct outlook on life, values and world view. Cultivate foreign students to have a correct learning attitude. Understand China, study rigorously, unite and cooperate, and learn successfully. Become a talent for promoting Sino-foreign friendly cooperation and exchanges.

2. 掌握本学科坚实宽广的力学基础理论和系统深入的专业知识，了解本学专业前沿动态，培养具有独立从事科学研究工作的能力，在力学及相关领域做出创造性成果的高级人才。至少熟练掌握一门外语，培养具有一定的国际视野和熟练进行国际学术交流的能力的国际型高精尖专门人才。

2. Master the solid and broad basic theory and systematic in-depth professional knowledge of this subject. Understand the frontier dynamics of this major, and cultivate senior talents who have the ability to independently engage in scientific research and make creative achievements in mechanics and related fields. Proficient in at least one foreign language. Cultivate international high-caliber professionals with a certain international perspective and the ability to conduct international academic exchanges.

3. 具有良好的道德品质、学术修养及团队合作精神。身心健康。培养留学硕士生成为德、智、体、美、劳全面发展的力学领域专门人才。

3. Have good moral character, academic accomplishment and teamwork spirit. Physical and mental health. Cultivate the masters who study abroad to become professionals in the field of mechanics with all-round development of virtue, intelligence, body, beauty and labor.

二、学科概况与研究方向 Discipline overview and research directions

1、学科概况:

Discipline overview:

江苏大学力学学科是江苏大学(原镇江农机学院)起源较早并逐渐发展完善的学科之一。1981年固体力学获国家首批硕士学位授权点；1996年流体力学获批硕士学位授权点；2003年固体力学获批博士学位授权点；2005年力学获批一级学科硕士学位授权点；2012年获批力学博士后流动站；2015年工程力学本科专业恢复招生；2018年获批力学一级学科博士学位授权点。固体力学是省“十一五”重点学科，力学学科是省“十二五”一级重点学科（培育）建设点、省“十三五”一级重点学科。

The discipline of Mechanics in Jiangsu University is one of the disciplines which originated earlier and developed gradually in Jiangsu University (formerly Zhenjiang Agricultural Machinery College). In 1981, one of the first national master's degree programs was awarded for Solid Mechanics. In 1996, Fluid Mechanics was granted master's degree authorization. In 2003, Solid Mechanics was granted doctoral degree authorization. In 2005, Mechanics was approved as a master's degree authorization center of first-class discipline. In 2012, it was approved as a post-doctoral mobile station. In 2015, the undergraduate program of Engineering Mechanics resumed enrollment. In 2018, it was approved as a doctoral degree authorization center in the first-class discipline of mechanics. Solid Mechanics is a key discipline in the 11th five-year plan of Jiangsu province. Mechanics is the first-class discipline construction site in the 12th five-year plan of Jiangsu province, and the first-class discipline in the 13th five-year plan of Jiangsu province.

近年来，学科获批了国家级“高端装备关键结构健康管理”国际联合研究中心、机械工业“机械结构损伤检测评估技术”重点实验室、江苏省机械及工程结构损伤诊断与管理工程技术研究中心、江苏省振动与噪声技术工程实验室、江苏省工程力学实验教学示范中心等国家、省部级机构，拥有开展高水平科学研究所需的各种软件和硬件设备。

Recently, the discipline of Mechanics has been approved several national and provincial institutions, such as the national "high-end equipment key structural health management" international joint research center, mechanical industry "mechanical structural damage detection evaluation technology" key laboratory, Jiangsu machinery and engineering structural damage diagnosis and management of engineering technology research center, Jiangsu provincial technical engineering laboratory of vibration and noise, Jiangsu provincial teaching demonstration center of engineering mechanics experiment, etc. There are a variety of software and hardware equipment necessary for high level scientific research.

学科师资力量雄厚，现有 77 名专业技术人员，其中博导 20 人，教授 25 人，副教授 36 人，具有博士学位的占 86%，具有海外留学经历的占 60%。拥有机械工业科技创新领军人才及江苏省首届创新争先奖状获得者 1 人、江苏省“双创人才”2 人、江苏特聘教授 1 人、江苏省“333 高层次人才培养工程”3 人、江苏省“青蓝工程”学术带头人及优秀青年学术骨干 6 人，江苏省“六大人才高峰”培养对象 7 人，江苏省“双创博士”12 人，江苏大学校创新团队 1 个。

The discipline of Mechanics has strong staff support. There are now 77 professional technicians, including 20 doctoral supervisors, 25 professors and 36 associate professors. 86% of them hold doctoral degrees, and 60% of them have overseas study experience. One staff is granted "machinery industry science and technology innovation talents" as well as "the first innovation awards of Jiangsu province". Two staffs are awarded "talents for entrepreneurship and innovation in Jiangsu province". One staff is the distinguished professor of Jiangsu province. Three staffs join the "333 high-level personnel training project". Six staffs are awarded as academic leaders and outstanding young academic backbones of "Qinglan project". Seven staffs are trained in the "Six major talent peaks" project of Jiangsu province. Twelve staffs are granted "innovation and entrepreneurial doctors of Jiangsu province". One research group is awarded as the "innovation team of Jiangsu University".

近年来, 学科主持承担国家自然科学基金、国防预研、省部级等政府项目近 70 项, 横向项目 2000 余项。发表学术期刊论文 220 篇, 其中 SCI 检索 164 余篇, 出版专著和教材 3 部。授权发明专利 84 项, 获国家级、省部级科技奖励 14 项。学科在人才培养、科学研究和社会服务方面成果丰富, 经济效益和社会效益显著, 在国内力学领域享有较高的声誉。

For the past few years, the discipline has undertaken nearly 70 government projects, including the national natural science foundation of China, national defense pre-research, and various of provincial and ministerial projects. Besides, more than 2,000 horizontal projects have been proceeded. Over 220 academic journal papers and 3 monographs and textbooks have been published, of which 164 have been indexed by SCI. 84 authorized invention patents and 14 national and provincial science and technology awards have been won. The discipline has made rich achievements in talent cultivation, scientific research and social services, and enjoys a high reputation in the field of mechanics in China for its remarkable economic and social benefits.

2、研究方向:

1. 动力学与控制 (080101):

- (1) 非线性动力系统的分岔与混沌
- (2) 控制理论及其应用

2. 力与多物理场耦合理论及跨尺度力学 (080102):

- (1) 智能材料结构中力与多物理场耦合理论及结构健康管理
- (2) 农业工程装备绿色再制造关键力学问题
- (3) 微/纳结构中的跨尺度物理力学

3. 工程中的多相流与复杂流动 (080103)

- (1) 荷电多相流理论及应用
 - (2) 计算流体力学
 - (3) 湍流减阻与流动控制
4. 工程结构中的关键力学问题 (080104) :
- (1) 工程结构力学行为及失效分析
 - (2) 工程结构无损检测及健康诊断
 - (3) 工程结构动态计算、试验分析及振动控制

Research direction:

1. Dynamics and control (080101):

- (1) Bifurcation and chaos of nonlinear dynamic system
- (2) Control theory and its application

2. Coupling theory of force and multiple physical fields as well as cross-scale mechanics (080102) :

- (1) Coupling theory of force and multiple physical fields in intelligent material structure and structural health management
- (2) Key mechanical problems of green remanufacturing in agricultural engineering equipment
- (3) cross-scale physical mechanics of micro/nano structures

3. Multiphase flow and complex flow in engineering (080103)

- (1) theory and application of charged multiphase flow
- (2) computational fluid mechanics
- (3) turbulence drag reduction and flow control

4. Key mechanical problems in engineering structures (080104) :

- (1) mechanical behavior and failure analysis of engineering structure
- (2) nondestructive testing and health diagnosis of engineering structures
- (3) dynamic calculation, test analysis and vibration control of engineering structure

三、学习年限 Duration of Study

全日制力学博士研究生的学习年限一般为四年,不允许提前毕业。在职力学博士研究生的学习年限一般为五年。如确有必要可申请延长,最长不超过六年。力学硕博连读研究生的学习年限为五至六年,最长不超过八年,详见《江苏大学来华留学研究生学籍管理办法》江大校〔2021〕300 号)。The normal program length for full-time PhD degree is 4 years. Early graduation is not

allowed. Generally, the length of study for in-service doctoral students in mechanics is 5 years. If necessary, the extension can be applied for up to six years. The length of study for the graduate students of mechanics is five to six years, and the longest is no more than eight years. For detailed information, please refer to the "Regulations on the Academic Status Management of International Graduate Students at Jiangsu University" (Jiangda Xiao [2021] No. 300).

四、课程要求 Course Requirements

1. 学分要求 Credit Requirements

(1) 研究生课程学习实行学分制, 每门课程 1~3 学分, 每个学分为 16-20 学时。The graduate student curriculum operates on a credit system, with each course carrying 1 to 3 credits, and each credit equivalent to 16-20 class hours.

(2) 课程总学分不低于 15 学分, 其中学位课不少于 10 学分, 选修课不少于 5 学分(专业选修课不低于 3 学分, 公共选修课不低于 1 学分)。The total course credits should not be less than 15 credits, with degree course credits not less than 10 credits and elective course credits not less than 5 credits (No less than 3 credits for professional elective courses, no less than 1 credit for public elective courses, and no less than 1 credit for online courses of humanistic quality).

2. 课程设置 Curriculum Design

课程类别 Course types		课程名称 Course name	学分 credits	学期 semester Spring/ Autumn	开课单位 school	课程性质 Type	备注 Mandatory/optional
学位课 Degree course	公共学位课 Public degree course	中国概况 Overview of China	2	Spring/Autumn	海外教育学院 OEC		必修 Mandatory
		汉语 1	1	Spring/Autumn	语言文化中心 Language &		
		汉语 2	1	Spring/Autumn	语言文化中心 Language &		
		汉语 3	1	Spring/Autumn	语言文化中心 Language &		
	基础理论课 Basic	Functional Analysis and Application 泛函分析理论及应	2	Autumn 秋学期	School of Mathematical Sciences	bilingual course 双语课程	任选 Optional

留学博士研究生培养方案中英文版

课程类别 Course types		课程名称 Course name	学分 credits	学期 semester Spring/ Autumn	开课单位 school	课程性质 Type	备注 Mandatory/optional
		Theory and Applications of Chaotic Dynamics 混沌动力学理论及	2	Autumn 秋学期	School of Mathematical Sciences 数学科学学院	bilingual course 双语课程	
		Mathematical Modelling and Application	2	Autumn 秋学期	School of Mathematical Sciences	bilingual course 双语课程	
	核心专业学位课 Core Specialized	Advanced Modern Mechanics Foundation 高等现代力学基础	3	Autumn 秋学期	Faculty of Civil Engineering and Mechanics	experimental course 双语+实验平	必修 Mandatory
非学位课 Non-degree course	专业选修课 Major optional courses	Nonlinear Vibration 非线性振动	2	Autumn 秋学期	Faculty of Civil Engineering and Mechanics	bilingual course 双语课程	任选 Optional
		Smart material structure and multi-field coupling theory 智能材料结构及多	2	Autumn 秋学期	Faculty of Civil Engineering and Mechanics	bilingual course 双语课程	
		Fundamentals of Micro/Nano-Mechanics 微纳米力学基础	2	Autumn 秋学期	Faculty of Civil Engineering and Mechanics	bilingual course 双语课程	
		Advanced Continuum Mechanics 高等连续介质力学	2	Autumn 秋学期	Faculty of Civil Engineering and Mechanics	bilingual course 双语课程	

课程类别 Course types		课程名称 Course name	学分 credits	学期 semester Spring/ Autumn	开课单位 school	课程性质 Type	备注 Mandatory/optional
		Viscous Fluid Mechanics 粘性流体力学	2	Autumn 秋学期	School of Energy and Power Engineering 能动学院	English taught course 全英文课程	
	公共选修课 Public optional courses	全校所有学科的全部博士研究生课程，主要为哲学、文学、计算机应用、实验操作与技能、实验安全、知识产权、科学道德、论文写作、信息检索、科技文化、心理健康等工具类和宽口径课程 All doctoral level programs in university , including philosophy, literature, computer applications, experimental operations and skills, experimental safety, intellectual property rights, scientific ethics, essay writing, information retrieval, science and technology, culture, mental health, and other general courses.					任选 Optional

五、实践要求 Practical Requirements

1. 学术活动 Academic Activities

博士研究生须参加学校组织的国内外知名专家学者的专题讲座、学术报告、研究生论坛等学术活动，参加学术活动后必须形成完整的学术报告。在学期间，博士生应参加学术活动不少于 15 次。博士研究生在国际会议或全国性高层次学术会议上进行学术论文展示或口头报告者，视同其学术活动环节合格，并由学院或导师负责考核。

Doctoral students must participate in academic activities organized by the university, such as special lectures, academic reports, and graduate forums featuring renowned experts and scholars from home and abroad. After attending these activities, students must produce comprehensive academic reports. During their academic period, doctoral students should participate in no fewer than 15 academic activities. Those who present academic papers or give oral reports at international conferences or high-level national academic conferences will be deemed to have fulfilled the academic activity requirement. Specific requirements will be set by each school and assessed by the school or supervisor.

2. 文献阅读 Literature Review

博士研究生要求一定数量的文献阅读，以培养研究生钻研学术文献的能力和自我获取知识的能力。文献阅读于学位论文开题前由学科组织专家小组统一考核并记录成绩，不合格者不得进入学位论文开题环节。

Doctoral students are required to read a certain number of academic papers to cultivate their ability to delve into academic literature and acquire knowledge independently. Before the proposal defense for their dissertation, students will undergo a unified assessment of their literature review by an expert panel organized by their discipline, and their performance will be recorded. Those who fail the assessment will not be allowed to proceed to the dissertation proposal defense stage.

3. 专题研讨 Seminars

博士研究生在学期间必须在学科范围内公开进行文献研读交流、学术研究进展汇报和专题研讨汇报，博士生不得少于6次，鼓励研究生跨学科研讨。专题研讨由导师审核认定。

During their academic period, doctoral students must publicly engage in literature reading and discussion, report on academic research progress, and present special seminars within their discipline. Each doctoral student must participate in no fewer than six such activities, and interdisciplinary seminars are encouraged. The seminars will be reviewed and approved by the supervisor.

六、学位论文与学位授予 Dissertation and Degree Awarding

1. **论文开题**：开题是博士研究生培养过程中开展学位论文工作的首要环节。学位论文实行集体开题，由学科方向统一组织，学位论文开题必须经导师审核同意方可进行。博士生学位论文开题报告审核通过16个月后方可申请送审答辩，具体要求详见《江苏大学研究生学位论文选题与开题的要求及考核办法》。

Dissertation Proposal: The proposal is the first crucial step in initiating the dissertation work during the doctoral student's training process. The dissertation proposal is conducted collectively and organized uniformly by the discipline. The proposal must be reviewed and approved by the supervisor before proceeding. A doctoral student can apply for submission and defense of the dissertation 16 months after the approval of their dissertation proposal report. Specific requirements are detailed in the "Requirements and Assessment Methods for Dissertation Topic Selection and Proposal of Jiangsu University Graduate Students."

2. **科研训练与科研成果**：研究生在学期间须参与科研训练，并获得一定的科研训练成果积分，具体要求详见《江苏大学关于研究生在读期间完成科研训练积分的规定》和各单位学位

评定分委员会提出的高于学校标准的相关要求。

Research Training and Research Achievements: Graduate students must participate in research training during their study period and accumulate a certain number of research training credits. Specific requirements are detailed in the "Regulations of Jiangsu University on Completing Research Training Credits for Graduate Students During Their Study Period" and relevant requirements set by the sub-committees for degree evaluation of each unit that are higher than the school's standards.

3. 中期汇报：研究生在学位论文工作中期应作中期汇报。具体办法为：由所在学院指定负责人组织不少于3名副高及以上职称的专家组成考核小组（包括主导师），举行公开报告会，由研究生对论文工作情况进行全面介绍，考核小组成员指出存在的问题，并提出改进意见。报告会需做好详细记录，考核小组针对研究生中期研究工作的情况给出评语和成绩，填写考核表，经考核小组负责人签字后交学院主管院长审核。中期汇报不通过者应明确论文工作延长时间，并再次组织中期汇报，直至通过。

Mid-term Report: Graduate students should present a mid-term report during the middle stage of their dissertation work. The specific method is as follows: The responsible person designated by the graduate school should organize an assessment panel consisting of no fewer than three experts with associate senior or higher professional titles (including the primary supervisor) to hold an open report meeting. At the meeting, the graduate student will comprehensively introduce the progress of their dissertation work, and members of the assessment panel will point out existing problems and suggest improvements. Detailed records of the report meeting should be kept. The assessment panel will provide comments and grades based on the graduate student's mid-term research work, fill out an assessment form, and submit it to the dean in charge of the graduate school after being signed by the head of the assessment panel. Students who fail the mid-term report should specify an extended period for their dissertation work and organize another mid-term report until they pass.

4. 论文撰写：学位论文必须在导师指导下由研究生本人独立完成，论文格式参见《江苏大学研究生学位论文撰写要求》。

Dissertation Writing: The dissertation must be independently completed by the graduate student under the guidance of their supervisor. The format of the dissertation is detailed in the "Requirements for Writing Dissertations by Graduate Students at Jiangsu University."

5. **论文评阅与答辩**：研究生的课程学习、培养环节、论文开题和中期汇报等均满足要求后方可进入学位论文送审、答辩（含预答辩）环节。学位论文送审、答辩等要求详见《江苏大学学位授予工作实施细则》和《江苏大学研究生学位论文送审工作办法》等相关规定。

Dissertation Review and Defense : Graduate students can enter the stages of dissertation submission for review and defense (including pre-defense) only after meeting the requirements for course study, training, dissertation proposal, and mid-term report. Detailed requirements for dissertation submission for review and defense are outlined in the "Detailed Rules for the Awarding of Degrees at Jiangsu University" and the "Regulations on the Submission of Dissertations for Review by Graduate Students at Jiangsu University," among other relevant regulations.

七、其他要求 Other Requirements

详见《江苏大学2020年度研究生培养方案修(制)订工作的指导意见》及学校相关规定。

For details, please refer to the "Guidelines for 2020 Graduate Training Program Revision (Formulation) of Jiangsu University" and to the relevant school regulations.