

工程力学（080104）

学科门类：工学（08）一级学科：力学（0801）

一、专业描述

力学是应用物理科学的一个分支学科，主要研究物体或系统受外力作用后的响应。工程力学属于力学学科中的一个二级学科，专注于求解工程实践中所遇到的各种相关力学和工程问题。需要综合应用数学、力学和工程科学中的基本原理，强调力学理论的工程应用。工程力学在土木水利工程、机械工程、航空航天工程等领域有着广泛的应用。

河海大学力学学科，是国家重点学科和江苏省重点学科。其主要特色是紧密结合水利水电工程，着重解决重大水电工程中的复杂结构分析和复杂工程问题的求解。学科从属于力学与材料学院，其前身工程力学系是河海大学最早建立的 5 个系科之一。工程力学系的创始人、著名力学专家徐芝纶院士也是水工结构工程学科博士点的第一个博士生导师。力学学科目前有 45 名教学科研人员，其中包括 26 名教授，15 名博导。近年来承担了大量与水电工程有关的科研课题，包括多项国家重点基础研究（973）项目课题，一项重点基金和一项杰出青年基金，大量面上基金、青年基金和横向项目，近三年科研经费总额超过 4 千万。

二、培养目标

工程力学博士生培养目标为，致力于培养水利、土木工程领域的

高端专门人才。毕业生具有坚实的数学和力学理论基础、系统的工程专业知识，和对复杂的工程问题正确建模分析的能力，能熟练运用现代基础理论和先进的计算方法及实验技术手段开展科学研究，能够胜任大型复杂工程的技术研究开发，高等院校和研究机构的教学和科研工作。

培养方案的设计要为学生提供良好的学术环境，学生将在资深教授（博导）的指导下，通过结合研究课题，探索新的知识和应用力学原理去解决工程问题。鼓励学生应用获得的知识和技能发展解决问题的能力，并且在所研究的领域贡献新的成果。

三、研究方向

工程力学专业全英文博士生培养计划包括（但不限于）一下几个主要研究方向：

- 高性能工程计算与仿真模拟
- 工程结构损伤检测与安全评估
- 工程材料力学特性与模拟

四、申请条件

工程力学全英文专业博士生申请人需要满足以下条件：

1. 已在我国认可的海内外高校或学术机构获得硕士学位者。
2. 能够用英语进行课程学习、阅读文献和进行学术写作，能够用英语进行日常交流。

五、培养年限

攻读博士学位的标准学制为 4 年，实行弹性学制，学习年限最短

不低于 3 年，最长不超过 6 年。

六、学分要求和课程设置

本专业博士留学研究生课程总学分为 15 学分，其中学位课程为 11 学分，非学位课程为 4 学分。另设教学环节。具体开设课程见附表。

Engineering Mechanics (080104)

Discipline: Engineering (08)

First- Class Discipline: Mechanics (0801)

1. Discipline Description

Mechanics is a discipline of applied physical science that studies the responses of bodies or body systems to the external forces. Engineering mechanics is an applied branch of mechanics devoted to the solution of mechanics problems arising from engineering practices, through integrated application of mathematical, scientific and engineering principles. Research in engineering mechanics has wide applications in many engineering fields including civil engineering, mechanical engineering, aeronautics and astronautics engineering, etc.

Engineering Mechanics in Hohai University is a key discipline of the country as well as a key discipline of Jiangsu Province. Highlighted by engineering applications, research in the Discipline of Engineering Mechanics at Hohai University is mainly focused on practical problems encountered in large hydro-electric engineering, geotechnical and structural engineering. Special emphasis is placed on the understanding of physical principles underlying modern engineering design. The discipline is accommodated in the college of Mechanics of Materials, which was formally known as the Department of Engineering Mechanics, one of the 5 earliest found departments in Hohai University. The late Prof. Xu Zhilun, a renowned engineering scientist in China and a fellow of the Chinese Academy of Science, was a department founder. He was also the first PhD supervisor in the discipline of hydraulic engineering. Currently the discipline has 45 academic staff, among them 26 are professors and PhD supervisors. They are engaged in many research projects in the areas of Structural Analysis and Safety Assessment of High Dams, the Mechanical Property of Engineering Materials, Computational Mechanics and Engineering Simulations, etc. In the last three years, the discipline has undertaken several research projects in National Basic Research Programs (973) funded by the Ministry of Science and Technology, a NSFC priority research project and an Outstanding Young Scientist Funding, many NSFC general research projects and other research and consulting projects. The total research funding in the last three years has exceeded RMB40

million Yuan.

2. Program Description

The program in Engineering Mechanics aims at cultivating high-level individuals with solid fundamental knowledge in the theory of mechanics and specialized in a particular engineering application, who are capable of handling complex technical problems in large engineering projects, can undertake research and development project in large engineering companies or teaching and research work in academic institutions.

The program is designed to provide students with an intellectual environment to explore the knowledge and principles in mechanics and engineering applications through research project under guidance of an established professor (PhD supervisor). Through the program, students have opportunities to develop their problem-solving ability with new knowledge and skills, and to make their own contributions to their research field.

3. Research Directions

The PhD program in Engineering Mechanics is mainly oriented (but not limited) to the following research areas:

- High performance engineering computation & simulation;
- Damage detection and safety assessment of engineering structures;
- Behavior of engineering materials and modeling

4. Application Requirements

(1) You have received the master degree from the domestic and overseas universities or academic institutions accredited by the Ministry of Education.

(2) You have the ability to read and write academic papers and communicate in English.

5. Educational System and Duration

The doctorate program is 4 years, the duration is minimum 3 years and no more than 6 years.

6. Credits and Courses

A doctoral student must take at least 15 credits of courses, including 11 credits of Required course of the degree and 4 credits of Non-required course of the degree. Module structure of the doctorate program of Engineering Mechanics is listed below.

工程力学全英文留学博士研究生课程设置

Courses for Doctoral Students of Engineering Mechanics

课程类别 Categories		课程编号 No	课程名称 Course	学时 Hours	学分 Credit	开课学期 Term	备注 Note
学位课程 11 学分 Required course of the degree 11 Credits	公共 课程 General Courses	2015LXS01	*汉语 Chinese Language	32	2	秋 fall	必修 RequiredCo urse
		2015LXS03	*中国概况 Introduction to China	32	2	秋 fall	
	基础 课程 Basic Courses	2015JC02	应用数学 Applied Mathematics	64	4	秋 fall	选修 3 学分 3Credits at least
		2015JC05	偏微分方程近代方法 Modern Methods in Partial Differential Equations	32	2	秋 fall	
		2015JC07	可靠性分析 Reliability Analysis	32	2	秋 fall	
	专业 课程 Major Courses	2017LC11	学科前沿专题 Modern Science of the Discipline	32	2		必修 RequiredCo urse
		2015LC01	塑性理论与本构模拟 Plasticity & constitutive Modelling of Engineering Materials	32	2	秋 fall	选修 2 学分 2 Credits at least
		2015LC02	高等计算力学 Advanced Computational Mechanics	32	2	春 spring	
	非学位课程 4 学分 Non-required course of the degree 4 Credits	2015JC10	结构动力学 Structural Dynamics	32	2	春 spring	选修 2 学分 2 Credits at least
2015LXS07		英文科技写作 The Art of Scientific Presentation and Writing in English	32	2	春 spring		
2015LXS04		*第二外国语（除母语与汉语外） Second Foreign Language	32	2		必修 RequiredCo urse	
教学环节 Academic Activities	学术活动 Seminar and Conferences						必修 RequiredCo urse
	科学研究 Scientific Research						
	文献阅读与综述 Literature Reading and Reviewing						