

机械工程（0802）

Mechanical Engineering

学科门类：工学（08） 一级学科：机械工程（0802）

Discipline: Engineering (08)

First-Class Discipline: Mechanical Engineering (0802)

一、学科简介

河海大学机械学科始建于1986年，1990年获机电控制及自动化硕士学位授予权，1996年列为水利部重点学科，同时设立水利部“机电控制及自动化重点实验室”，1994年、1996年和2003年依次获机械设计及理论、材料加工工程和机械制造及其自动化硕士学位授予权，2005年设立机械工程一级学科硕士学位授权点。本学科拥有“疏浚技术教育部工程研究中心”、“机电控制及自动化水利部重点实验室”、“江苏省特种机器人技术重点实验室”三个部级科研基地和“常州市数字化制造技术重点实验室”、“常州市光伏系统集成与生产装备技术重点实验室”、“常州市特种机器人及智能技术重点实验室”、“常州市高空作业装备与智能技术”四个常州市重点实验室。现有硕士生导师77名，博士生导师12名，教授19名。

本学科围绕“水利特色，学科融合”建设目标，紧密跟踪与引领学科发展动态，在疏浚技术与装备、机械设计理论、水利抗洪抢险机械、水工金属结构、水工构筑物探测与修复、新能源利用技术的理论与应用研究、计算机辅助设计与制造及水下机器人技术等方面进行了大量的研究，形成了独具特色的研究方向。目前，本学科水利机械领域的研究处于国内外领先地位，大批毕业的研究生服务于水利、机械行业中。近5年以来，本学科主持与承担了413项科研项目，发表论文860余篇，获国家、省部级科技进步奖19余项。

I. Discipline Overview

The Mechanical discipline of Hohai University was founded in 1986 and it started offering M.E. degree in “Mechanical and Electrical Control and Automation” from 1990. Mechanical Engineering was recognized as a key discipline of the Ministry of Water Resources (MWR) in 1996, and the Key Laboratory of Electromechanical Control and Automation of the Ministry of Water Resources was established. The M.E. degrees in “Mechanical Design and Theory”, “Material Processing Engineering” and “Mechanical and Electrical Control and Automation” were offered in 1994, 1996 and 2003 respectively. And the first-level M.E. degree in “Mechanical Engineering” was approved in 2005. The discipline has three provincial and ministerial laboratories: the Engineering Research Center of Dredging Technology of the Ministry of Education, the Key Laboratory of Electromechanical Control and Automation of the Ministry of Water Resources, and the Key Laboratory of Special Robots of Jiangsu Province. It also has four municipal key laboratories of Changzhou: the laboratory of Digital Manufacturing Technology, the laboratory of Photovoltaic System Integration and Production Equipment Technology, the laboratory of Special Robot and Intelligent Technology, and the laboratory of Aerial Work Equipment and Intelligent Technology. Now there are 77 Master supervisors, 12 PhD supervisors and 19 professors under this discipline.

To achieve the goal of “Water Feature, Discipline Integration”, this discipline closely follows and leads the development trends of subject, and several researches, including the Dredging Technique and Equipment, Mechanical Design and Theory, Water Machinery for Flood-fighting and Emergency Rescues, Hydraulic Metal Structure, Hydraulic Structure Detection and Repair, the Theory and Application of New Energy Technology, Computer Aided Design and Underwater Robot Technology, are conducted. Some unique research directions have been established. At present, the research in the field of hydraulic engineering machinery is in a top position at home and abroad, and a large number of graduate students serve for the hydraulic and machinery engineering industries. In the past five years, researchers of this discipline have hosted and undertaken 413 research projects, published more than 860 papers and won 19 national, provincial

and ministerial science and technology awards.

二、培养目标

1. 河海大学硕士层次外国留学生应当在机械工程领域中具有较好的国际视野，能够在多个国家的实际环境中运用和发展机械工程的知识、技能和方法，并具备参与国际事务和国际竞争的能力。

2. 以英语为专业教学语言的学科、专业中，外国留学生毕业时，硕士研究生的中文能力应当至少达到《国际汉语能力标准》三级水平。

3. 机械工程学科硕士留学研究生旨在培养本学科领域的高级专门人才。培养在掌握机械工程学科扎实的基础理论知识、系统的专门知识和技能方法，对本学科的国内外现状和发展趋势、前沿领域具有系统深入的了解；具有从事本学科的科学研究的或担负专门技术工作的能力，能比较熟练阅读、撰写科技论文和进行学术交流；了解中国文化并具备汉语日常交流能力的高级专门人才。

II. Training Objectives

1. International master graduates of Hohai University are expected to have good international view, to apply and develop the theories, skills, and methodologies in the actual environment of several countries, and to participate in the international academic affairs.

2. International master graduates must meet the requirement of Level 3 in Chinese Language Proficiency Scales upon graduation if they conduct their coursework in English.

3. The purpose of the master's degree in Mechanical Engineering is to train senior professionals in this field. The objectives of this discipline are to train the students with the capabilities in mastering the solid fundamental theories and knowledge of Mechanical Engineering discipline and the systemic specialized knowledge and skills; understanding the domestic and abroad developments and frontiers in this discipline in deep, and conducting scientific researches and specialized technologies; reading, writing academic papers and communicating; understanding Chinese culture and having the ability of daily communication in Chinese.

三、主要研究方向

1. 水利机械装备及工程
2. 机器人与智能控制
3. 机械动力学及设计理论
4. 先进制造技术与系统

III. Research Directions

1. Water Conservancy Machinery Equipment and Engineering
2. Robots and Intelligent Control
3. Machinery Dynamics and Design Theory
4. Advanced Manufacturing Technology and Systems

四、学制和学习年限

学术学位全英文硕士留学研究生的标准学制为 3 年。实行弹性学制，学习年限最短不少于 2 年，最长不超过 5 年。

IV. Number of Years Requirement

The master program typically requires 3 years to complete. However, the completing time may vary to 2 years as the minimum and 5 years as the maximum.

五、学分要求和课程设置

1. 学术学位全英文硕士留学研究生课程总学分为 27 学分，其中学位课程为 20 学分，非学位课程为 7 学分。另设教学环节。所有课程学习一般应在入学后 1 年内完成。
2. 汉语课每学分为 24 学时，中国概况课每学分为 18 学时，其他课程每学分为 16 学时。
3. 中国国情教育（水韵课堂）为系列专题讲座，要求学生按照要求完成规定的学习任务。
4. 对于汉语水平已达到毕业要求的学生，可申请免修汉语，具体要求详见留学生课程免修有关

规定。

具体课程设置如下：

V. Credit Requirements and Curriculum

1. International academic master students will complete 27 credits, 20 of which are from degree courses, and 7 of which are from non-degree courses. Students will also complete academic activities. Coursework will be completed in one year after registration.

2. Each credit of Chinese language course is 24 credit hours. Each credit of Introduction to China is 18 credit hours. For other courses, each credit is 16 credit hours.

3. “Water Harmony Lectures” is a series of seminars, which require students to complete the specified learning tasks.

4. For students who have met the Chinese language requirement for the master degree, Chinese language courses can be exempted, of which the details can be referred to in relevant regulations.

The specific curriculum is as follows:

机械工程全英文学术型留学硕士研究生课程设置

Curriculum for English Taught International Academic Master Students Majoring in Mechanical Engineering

课程类别 Category	课程代码 Course Code	课程名称 Course Name	学分 Credit	学时 Hours	开课学期 Term	备注 Remarks	
学位课程 Degree Course 20 学分	公共课程 General Course	2022LM000001	汉语 I Chinese Language I	2	48	秋 Autumn	必修 Compulsory
		2022LM000002	汉语 II Chinese Language II	2	48	春 Spring	
		2022LM000003	中国概况 Introduction to China	2	36	秋 Autumn	
		2022LM110001	论文写作指导 Guide of Thesis Writing	2	32	秋、春 Autumn/ Spring	
	基础课程 Basic Course	2022LM880001	矩阵论 Matrix Theory	2	32	春 Spring	选修 8 学分 Optional 8 credits at least
		2022LM880002	最优化方法 Optimization Methods	2	32	秋 Autumn	
		2022LM880003	数值分析 Numerical Analysis	3	48	秋 Autumn	
		2022LM770003	弹性力学 Elastic Mechanics	2	32	秋 Autumn	
		2022LM990601	综合能源系统 Integrated Energy System	2	32	春 Spring	
	专业课程 Major Course	2022LM120101	机械设计工程学 Mechanical Design Engineering	2	32	春 Spring	选修 4 学分 Optional 4 credits at least
		2022LM120102	现代测试技术与应用 Technology and Application of Modern Measurement	2	32	秋 Autumn	
		2022LM120103	数字化制造技术与方法 Digital manufacturing technology and the method	2	32	秋 Autumn	
	非学位课程 Non-degree Course 7 学分	2022LM110002	中国国情教育（水韵课堂） Water Harmony Lectures	1	16	秋、春 Autumn/ Spring	必修 Compulsory
2022LM120104		人机工程学 Ergonomics	2	32	春 Spring	选修 6 学分 Optional 6 credits at least	
2022LM120105		计算机辅助设计与制造 CAD/CAM Computer Aided Design and Manufacturing	2	32	秋 Autumn		
2022LM120106		有限元工程案例分析 Finite Element Analysis of Engineering Projects	2	32	秋 Autumn		
2022LM120107		机电控制与机器人技术 Mechatronics and Robotics	2	32	春 Spring		
选修硕士课程 Optional courses for master						选修 Optional	
教学环节 Academic Activity	学术活动（含博导讲座） Seminar and Conferences (including lecturers by PhD advisors)				必修 Compulsory		
	实践活动 Practice Activity						
	科学研究 Scientific Research						

六、教学环节

1. 个人培养计划

学术学位硕士研究生入学后，应在导师指导下，在规定时间内按照培养方案和学位论文工作有关规定，结合研究方向和本人实际情况制定个人培养计划，其中学习计划在入学 2 个月内提交。

2. 学术活动

学术学位硕士研究生学术活动包括参加国内外学术会议、专家学术讲座，以及研究生学术研讨活动等。申请学位论文答辩前必须参加 10 次以上的学术交流活动，其中博导讲座至少 2 次。研究生参加学术活动必须填写相关学术活动登记本。

3. 实践活动

为培养劳动实践能力和责任意识，学术学位硕士研究生必须参加实践活动，实践活动形式包括助教、助管、助研、生产实践、社会实践等。由导师对学生实践环节的时长和效果进行考核和评价。

VI. Academic Activities

1. Study Proposal

The master students must prepare a study proposal on how they will complete the master degree by considering their research interests, advice from their research advisors, and other requirements mentioned in this document. The proposal must be submitted in two months after official registration.

2. Seminars and Presentations

Master students must participate in academic conferences, seminars by experts and PhD advisors, and discussion panels. Before their dissertation defense, master students must participate in seminars and conferences over 10 times, including at least 2 seminars by PhD advisors. All the seminars and presentations should be recorded in relevant record book.

3. Practice Activities

Master students are required to participate in practice activities to prepare professional development. Practice activities include teaching assistantship, research assistantship, management assistantship, and

industry engagement etc., which are to be assessed by the advisors.

七、论文工作

学术学位硕士学位论文研究工作必须经过文献阅读、论文选题、论文计划及开题报告、论文中期检查、科研成果产出、学位论文预审、学位论文评阅、学位论文答辩等环节。具体按照《河海大学硕士学位论文工作管理办法》和学院相关文件执行。留学硕士研究生可使用英文撰写论文。

VII. Dissertation

The dissertations of academic master students are required to complete the stages of literature review, topic selection, dissertation plan and dissertation proposal, mid-term examination, output of scientific research achievements, pre-examination, review and assessment, and dissertation defense. Detailed requirements can be referred to in “Hohai University Master's Dissertation Management Measures” and relevant documents in the College of Mechanical and Electrical Engineering. Dissertation in English is acceptable.

八、本学科推荐阅读的重要书目、专著和学术期刊

VIII. Recommended Bibliographies, Monographs and Academic Journals of the Discipline

1. 徐芝纶, 弹性力学.北京:高等教育出版社, 2006.
2. 郭日修. 弹性力学与张量分析.北京:高等教育出版社, 2003.
3. 曾攀. 有限元分析与应用.北京:清华大学出版社, 2004.
4. Saeed Moaveni, 王崧等译. 有限元分析—Ansys 理论与应用(第三版). 北京:电子工业出版社, 2015.
5. 邹慧君, 王晶, 宋友贵. 高等机械动力学.北京:高等教育出版社, 2013.
6. 黄真, 赵永生, 赵铁石. 高等空间机构学(第二版).北京:高等教育出版社, 2014.
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8. (美)约翰.克雷格. 机器人学导论.北京:机械工业出版社, 2018.
9. 高峰编. 并联机器人型综合的 GF 集理论.北京:科学出版社, 2017.
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16. 戴凤智等. 工业机器人技术基础及其应用.北京:机械工业出版社, 2020.
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18. 克来格(Craig J.J)著,贡超等译. 机器人学导论(原书第 3 版), 2006
19. 薛红涛. 机械振动基础.北京:机械工业出版社, 2019.
20. 刘习军等. 振动理论及工程应用(第二版).北京:机械工业出版社, 2018.
21. 钟秉林,黄仁. 机械故障诊断学.北京:机械工业出版社, 2006.
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48. 参考期刊:Journal of Vibration and Acoustics, ASME

49. 参考期刊:ASME Journal of Mechanical Engineering, ASME

50. 参考期刊:IEEE Control Systems Magazine, IEEE

51. 参考期刊:IEEE Robotics& Automation Magazine, IEEE

52. 参考期刊:IEEE Transactions on Automatic Control, IEEE

53. 参考期刊:IEE Transactions on Automation Science and Engineering, IEEE

54. 参考期刊:IEEE Transactions on Control Systems Technology, IEEE

55. 参考期刊:IEEE Transactions on Fuzzy Systems, IEEE

56. 参考期刊:IEEE-ASME Transactions on Mechatronics, IEEE

57. 参考期刊:IEEE Transactions on Industrial Electronics, IEEE

58. 参考期刊:IET Control Theory and Applications, IET

59. 参考期刊:Journal of Hydraulic Research, International Association for Hydraulic Research

60. 参考期刊:Journal of Hydraulic Engineering, American Society of Civil Engineers, (ASCE)

61. 参考期刊:机械工程学报(中英文版),中国机械工程学会

62. 参考期刊:自动化学报,中国自动化学会

63. 参考期刊:力学学报,中国力学学会

64. 参考期刊:计算力学学报,中国力学学会

65. 参考期刊:振动工程学报,中国振动工程学会

66. 参考期刊:计算机集成制造系统,中国兵器工业集团

67. 参考期刊:系统仿真学报,中国系统仿真学会
68. 参考期刊:中国机械工程,中国机械工程学会
69. 参考期刊:机器人,中国自动化学会