农业工程（0828）
Agricultural Engineering

学科门类：工学（08）　一级学科：农业工程（0828）

Discipline Category: Engineering (08)

First-Class Discipline: Agricultural Engineering (0828)

一、学科简介

本学科是河海大学传统优势学科，源于 1952 年成立的水利与土壤改良专业，是建国后国内最早设立的专门培养农业水土工程专门人才的学科之一，分别于 2003 年和 2011 年获得农业工程一级学科硕士和博士学位授予权，2014 年获农业工程博士后流动站，2016 年入选江苏省重点学科。本学科拥有一支在行业具有广泛影响的、中青年博士教师为骨干的、勇于创新的一流师资队伍，现有博士生导师 21 名，硕士生导师 41 名。在高效节水灌溉理论与技术、南方节水减排与生态灌区建设、农业水土环境调控、灌区现代化管理、泵站工程水力优化等方面具有显著特色和优势，其中在南方节水减排与生态灌区建设、大型泵站工程水力优化方向的研究处于国际先进水平。

本学科承担了国家重点研发计划项目、973 项目、863 项目、国家科技支撑计划项目、国家自然科学基金重点项目等大量国家级项目，并承担了节水灌溉技术研发、现代化生态灌区建设、大型泵站工程水力优化等行业科研项目，取得了大量研究成果及显著的社会和经济效益，获国家科技奖一等奖、二等奖和省部级科技奖 50 余项。本学科培养的研究生就业率接近 100%，主要去向包括不同国家的高校、科研院所及水利、农业等行业部门。

I. Discipline Overview

Agricultural engineering (AE) is one of the best majors in Hohai University , which can be tracked to the major of water conservancy and soil amelioration founded in 1952. It is one of the earliest established majors to cultivate the special talents for agricultural soil and water engineering since the foundation of the Peoples'

Republic of China. In 2003 and 2011, AE was approved as an ME degree and Ph.D. degree program, respectively. In 2014, the postdoctoral research station for AE was issued. In 2016, it was selected as a key discipline in Jiangsu Province.

There are 21 PhD supervisors and 41 ME supervisors, all of them are young Ph.D. holders and initiative and creative scientists with a very good reputation in their research field. They pioneered the research in the fields of efficient irrigation theory and technology, saving water to mitigate non-point pollution and sustain the ecological irrigation district development, soil and water environment protection, modern management for irrigation district, and hydraulic optimization of pumping stations. Among these, saving water to mitigate non-point pollution and sustain the ecological irrigation district development, and hydraulic optimization of pumping stations ranked at the top level worldwide.

Their researches were funded by several top national programs, including the national key research and development program, state basic research development program (973 programs), and national high technology research and development program (863 programs), national science and technology support program, and national science foundation program. Also undertook lots of industrial research projects, in the field of efficient irrigation technique development, designing and planning modern ecological irrigation districts, and hydraulic optimization of large pumping stations. Based on these researches, plentiful fruits in the AE field were brought forward, and contributed to the social development either in economy or ecology. For their contributions either in basic research or in the social development. More than 50 top national or provincial technology awards were issued for their contributions either in basic research or in social development, including the first and second prizes of the national science and technology progress award. The graduates of AE major are mostly employed by universities, research institutes, local or national water conservancy or agriculture government departments in different countries, the employment rate is approaching 100%. Graduates were highly praised and valued by employers.

二、培养目标

1. 河海大学硕士层次外国留学生应当在农业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农业工程的知识、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. 本学科旨在培养农业工程领域全方位发展的高层次人才：恪守学术道德，崇尚学术诚信；掌握坚实的基础理论和系统的专门知识，具有从事科学研究工作或独立担负相关工程规划、设计、施工或管理等专门技术工作的能力。

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. It aims to cultivate top level innovative talents with full development in the field of AE. They should abide by academic ethics and advocate academic integrity. They should master a solid basic theory and systematic expertise knowledge, and have the ability to engage in scientific research or be independently responsible for some specialized technical workers including engineering planning, design, construction, or management.

三、主要研究方向

1. 灌溉排水理论与技术

2. 农业水土环境与保护

3. 水土保持工程

4. 农业生物环境工程

5. 水土资源规划与管理

III. Research Directions

1. Irrigation and Drainage Engineering

2. Protection of Agricultural Soil and Water Environment

3. Soil and Water Conservation

4. Agricultural Bio-Environmental Engineering

5. Planning and Utilization of Agricultural Soil and Water

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 28 学分，其中学位课程为 19 学分，非学位课程为 9 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's students will complete 28 credits generally, 19 of which are from degree courses, and 9 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 requires students to complete the specified learning tasks.

4. For students who meet the Chinese language requirement for the PhD degree, Chinese language courses can be exempted, of which the details can be referred to in relevant documents.

The specific curriculum provision is as follows:

农业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 in Agricultural 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 19 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	2022LM880002	最优化方法 Optimization Methods	2	32	秋 Autumn	必修 Compulsory
		2022LM880003	数值分析 Numerical Analysis	3	48	秋 Autumn	
		2022LM990103	水资源规划与管理 Water Resources Planning and Management	2	32	春 Spring	选修 4 学分 Optional 4 credits at least
		2022LM990501	生态修复理论与技术 Ecological Restoration Theory and Technology	2	32	春 Spring	
		2022LM990505	地下水污染防治 Groundwater Pollution Control	2	32	春 Spring	
	专业课程 Major Course	2022LM991101	节水灌溉理论 Water Saving Irrigation	2	32	秋 Autumn	选修 2 学分 Optional 2 credits at leas
		2022LM110101	农业环境生态学 Agricultural Environment and Ecology	2	32	春 Spring	
		2022LM110104	泵站水力优化与节能 Hydraulic Optimization and Energy Saving of Pumping Station	2	32	春 Spring	
非学位课程 Non-degree Course 9 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
		2022LM110102	试验设计及统计 Design and Statistics of Experimentation	2	32	春 Spring	选修 8 学分 Optional 8 credits at least
		2022LM110103	环境生物技术 Environmental Biotechnology	2	32	春 Spring	
		2022LM330001	程序设计方法 Methods of Programming	2	32	秋 Autumn	
		2022LM990201	多目标决策理论及方法 Theory and Method of Multi-Objective Decision-making	2	32	春 Spring	
		2022LM990502	环境影响评价 Environmental Impact Assessment	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				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 Agricultural Science and 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. 张展羽,俞双恩等. 水土资源规划与管理[M].北京:中国水利水电出版社,2017.
2. 郭元裕. 农田水利学[M].北京:中国水利水电出版社,2000.
3. 彭世彰,徐俊增. 农业高效节水灌溉理论与模式[M].北京:科学出版社,2009.
4. 康绍忠. 农业水土工程概论[M].北京:中国农业出版社,2007.
5. 雷志栋,杨诗秀. 土壤水动力学[M].北京:清华大学出版社,1988.
6. 邵孝侯. 农业水土环境工程学[M].南京:河海大学出版社,2011.
7. 王沛芳,钱进,侯俊. 生态节水型灌区建设理论技术及应用[M].北京:科学出版社,2020.
8. 蔡守华. 旱作物地面灌溉节水技术[M].郑州:黄河水利出版社,2012.

9. 薛智勇主编. 农业固体废物处理与处置[M].郑州:河南科学技术出版社,2016.

10. 余新晓,毕华兴. 水土保持学[M].北京:中国林业出版社,2013.

11. 谢崇宝. 灌区用水管理信息化结构体系[M].北京:中国水利水电出版社,2010.

12. 成立,刘超等. 泵站水流运动特性及水力性能[M].北京:中国水利水电出版社,2016.

13. 王福军. 计算流体动力学分析—CFD 软件原理与应用[M].北京:清华大学出版社,2004.

14. 汪建文主编. 可再生能源[M].北京:机械工业出版社,2011.

15. 明道绪主编. 田间试验与统计分析(第三版) [M].北京:科学出版社,2016.

16. 盖钧镒主编. 试验统计方法(第 4 版) [M].北京:中国农业出版社,2013.

17. 乐毅全主编. 环境微生物学（第三版）[M].北京:化学工业出版社,2019.

18. 薛禹群,谢春红著. 地下水数值模拟（地学卷）[M].北京:科学出版社,2000.

19. 水谷正一等编著,陈菁,潘悦译. 农业工程师的伦理学[M].北京:中国水利水电出版社,2021.

20. 陈菁,吕萍编著. 农村水景观建设[M].南京:河海大学出版社,2011.

21. Anonymous.(Ed.) Agriculture:Manures,Fertilizers & Farm Crops,Including Green Manuring and Crop Rotation[M].Nabu Press,2010.

22. Stefano LD,Ramon LM,Lucia DS.(Ed.) Water,Agriculture and the Environment in Spain[M].2012.

23. Shao Xiaohou. Agricultural water and soil environmental engineering. Nanjing: Hohai University Press,2011.

24. Douglas C. Montgomery. Design and analysis of experiments,人民邮电出版社,2007.

25. Peter Johnstone. Planning and Managing Agricultural and Ecological Experiments,Routledge,2013.

26. Kenneth Stehlik-Barry ,Anthony J. Babinec Data Analysis with IBM SPSS Statistics:Implementing Data Modeling,Descriptive Statistics and ANOVA,Packt Publishing,2017.

27. Rittmann B E,Mccarty P L . Environmental biotechnology:principles and applications[J]. Environmental Biotechnology Principles & Applications,2014.

28. Menon,E. Shashi. Working guide to pumps and pumping stations:calculations and

simulations[M].Burlington,MA:,Gulf Professional Pub,2010.

29. Taiz L,Zeiger E. Plant Physiology (5th)[M].Sinauer Associates Inc Publishers,2010.

30. Taiz L,Zeiger E,Moller I.M. and Murphy A. Plant Physiology and Development (6th) [M].Sinauer Associates Inc Publishers,2014.

31. Zhang Zhanyu, Shao Guangcheng, Zai Yaming. Irrigation and drainage engineering:planning and design. Nanjing: Hohai University Press,2018.

32. 期刊：农业工程学报

33. 期刊：农业机械学报

34. 期刊：水利学报

35. 期刊：水科学进展

36. 期刊：灌溉排水学报

37. 期刊：水土保持学报

38. 期刊：环境科学学报

39. 期刊：生态学报

40. 期刊：Agricultural Water Management (ISSN 0378-3774)

41. 期刊：Irrigation Science (ISSN 0342-7188)

42. 期刊：Irrigation and Drainage (ISSN 1531-0533)

43. 期刊：Journal of Hydrology (ISSN 0022-1694)

44. 期刊：Journal of Cleaner Production (ISSN 0959-6526)

45. 期刊：Journal of Experimental Botany (ISSN 0022-0975)

46. 期刊：Atmospheric Environmental (ISSN 1352-2310)

47. 期刊：Environmental pollution (ISSN 0269-7491)

48. 期刊：Agricultural and Forest Meteorology (ISSN 0168-1923)

49. 期刊：Hydrological Processes (ISSN 0885-6087)

50. 期刊：Soil Science Society of America Journal (ISSN 0361-5995)

51. 期刊：Soil Biology and Biochemistry (ISSN 0361-5995)

52. 期刊：European Journal of Soil Science (ISSN 1351-0754)

53. 期刊：Soil & Tillage Research (ISSN 0167-1987)

54. 期刊：Geoderma (ISSN 0016-7061)

55. 期刊：Applied Soil Ecology (ISSN 0929-1393)

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58. 期刊：European Journal of Agronomy (ISSN 1161-0301)

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