

软件工程（0835）

Software Engineering

学科门类：工学（08） 一级学科：软件工程（0835）

Discipline Category: Engineering (08)

First-Class Discipline: Software Engineering (0835)

一、学科简介

河海大学软件工程一级学科是以我校“计算机科学与技术”一级学科博士点、“水信息学”二级学科博士点和计算机科学与技术博士后流动站为依托，以国家优势学科创新平台、国家级科研基地和省部级科研基地为支撑，于2011年新增为一级博士点学科，同年被评为江苏省重点学科。目前拥有江苏省“青蓝工程”优秀学科梯队1个，教育部新世纪优秀人才1名，教育部高等学校计算机科学与技术教学指导委员会软件工程专业教学指导分委员会委员1名，江苏省“六大人才高峰”项目获得者5人，江苏省“333工程”入选者7人。

近年来，本学科紧密围绕江苏软件强省建设和水利信息化的发展和需要，依托河海大学优势学科平台建设，承接了国家“973”、“863”、自然科学基金等基础研究类项目，以及三峡工程管理系统、国家防汛抗旱指挥系统、数字黄河工程、水资源监控管理系统等一批重大工程的信息化建设项目，积极推进水利信息化工作。在领域工程技术、复杂软件系统建模与验证、数据管理与领域知识发现、软件工程安全理论与技术、万维网软件工程等方向上形成了明显的特色和优势。

I. Discipline Overview

The first-level discipline of software engineering of Hohai University is based on the first-level doctoral program of computer science and technology, the second-level doctoral program of water informatics and the postdoctoral station of computer science and technology, supported by the national advantageous discipline innovation platform, national research bases and provincial and ministerial research bases. In 2011, the first-

level doctoral program was added. It was awarded as a critical discipline in Jiangsu Province in the same year. At present, there is one excellent discipline echelon of "Youth and Blue Project" in Jiangsu Province, one exceptional talent of the new century from the Ministry of Education, one member of the Teaching Steering Committee of Software Engineering of the Teaching Steering Committee of Computer Science and Technology in Higher Education Institutions of the Ministry of Education, and five members of "Six Talent Summits" in Jiangsu Province. Five winners of the "Six Talent Summits" project in Jiangsu Province and seven selected candidates of the "333 Project" in Jiangsu Province.

In recent years, the discipline closely focused on the construction of Jiangsu software province and the development and needs of water resources informatization, relying on the structure of the excellent discipline platform of Hohai University, and undertakes the national "973", "863", natural science funds and other primary research projects, as well as We, have conducted several significant projects such as the Three Gorges Project Management System, the National Flood Control and Drought Relief Command System, the Digital Yellow River Project, and the Water Resources Monitoring and Management System, and actively promoted the work of water resources informatization. We have formed prominent characteristics and advantages in domain engineering technology, complex software system modelling and verification, data management and domain knowledge discovery, software engineering security theory and technology, and World Wide Web software engineering.

二、培养目标

1. 河海大学博士层次外国留学生应当在软件工程领域中具有宽阔的国际视野，能够在世界范围内创新运用和发展软件工程的理论、技能和方法，在国际事务中具有竞争优势。
2. 以英语为专业教学语言的学科中，外国留学生毕业时，博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. 软件工程博士留学生旨在培养本学科领域的高层次人才。培养在本门学科上掌握坚实宽广的

理论基础和系统深入的专门知识；具有独立从事科学研究工作的能力；在科学或专门技术上做出创造性的成果；能够熟练应用计算机开展科学研究和英语进行学术交流，了解中国文化并具备汉语日常交流能力的高层次学术型人才。

II. Training Objectives

1. International PhD graduates of Hohai University are expected to have broad international view in the relevant academic fields; to creatively apply and develop the theories, skills, and methodologies of the relevant disciplines in the world, and to obtain competitive advantage in the international academic affairs.

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

3. Doctoral students in software engineering aim to cultivate high-level talents in this discipline. It aims to develop high-level academic skills who have a solid and broad theoretical foundation and systematic and in-depth expertise in this discipline; who can conduct scientific research independently; who have made creative achievements in science or unique technology; who are proficient in applying computers for scientific research and academic communication in English; who understand Chinese culture and have the ability to communicate in Chinese in daily life.

三、主要研究方向

1. 领域工程
2. 复杂软件系统建模与验证
3. 数据管理与领域知识发现
4. 软件安全理论与技术
5. 万维网软件工程
6. 人工智能软件系统

III. Research Directions

1. Domain Engineering
2. Modeling and Verification of Complex Software Systems
3. Data Management & Domain Knowledge Discovery
4. Theory and Technology of Software Security
5. Web Software Engineering
6. Artificial intelligence software systems

四、学制和学习年限

学术学位全英文博士留学研究生的标准学制为 4 年。实行弹性学制，学习年限最短不少于 3 年，最长不超过 6 年。

IV. Number of Years Requirement

The PhD program typically requires 4 years to complete. However, the completing time may vary to 3 years as the minimum and 6 years as the maximum.

五、学分要求和课程设置

1. 学术学位全英文博士留学研究生课程总学分为 15 学分，其中学位课程为 10 学分，非学位课程为 5 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 PhD students will complete 15 credits, 10 of which are from degree courses, and 5 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 PhD degree, Chinese language courses can be exempted, of which the details can be referred to in relevant regulations.

The specific curriculum is as follows:

软件工程全英文学术型留学博士研究生课程设置

Curriculum for English Taught International Academic PhD Students in Software 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 10 学分	公共课程 General Course	2022LD000001	汉语 I Chinese Language I	2	48	秋 Autumn	必修 Compulsory
		2022LD000003	中国概况 Introduction to China	2	36	秋 Autumn	
		2022LD110001	论文写作指导 Guide of Thesis Writing	2	32	秋、春 Autumn/ Spring	
	基础课程 Basic Course	2022LD990101	水文学与水文模拟 Hydrology and Hydrological Modelling	2	32	秋 Autumn	选修 2 学分 Optional 2 credits at least
		2022LD990401	岩石水力学 Rock Hydraulics	2	32	春 Spring	
		2022LD991001	应用地球物理 Applied Geophysics	2	32	春 Spring	
		2022LD070104	分布计算与分布式系统 Distributed Computing & Systems	2	32	秋 Autumn	
	专业课程 Major Course	2022LD880001	应用数学 Applied Mathematics	4	64	秋 Autumn	选修 2 学分 Optional 2 credits at least
		2022LD070102	现代数字信号处理 Modern Digital Signal Processing	2	32	秋 Autumn	
		2022LD070103	视频处理 Video Processing	2	32	春 Spring	
		2022LD070110	现代数据管理技术 Modern Data Management Technology	2	32	秋 Autumn	
		2022LD070105	高级机器学习 Advanced Machine Learning	2	32	秋 Autumn	
		2022LD070101	学科前沿专题 Modern Science of the Discipline	1	16	秋 Autumn	
非学位课程 Non-degree Course 5 学分	2022LD110002	中国国情教育（水韵课堂） Water Harmony Lectures	1	16	秋、春 Autumn/ Spring	必修 Compulsory	
	2022LD000002	汉语 II Chinese Language II	2	48	春 Spring		
	2022LD070114	计算机视觉 Computer Vision	2	32	秋 Autumn	选修 2 学分 Optional 2 credits at least	
	2022LD070109	可计算性与计算复杂性 Computability and Computational Complexity	2	32	春 Spring		
	2022LD070112	高级计算机辅助设计与数字化 Advanced Computer-Aided Design and Digitization	2	32	春 Spring		
	2022LD070113	数值计算程序设计 Numerical Computing Programming Design	2	32	春 Spring		
	选修博士课程 Optional courses for PhD						选修 Optional
教学环节 Academic Activity	学术活动（含博导讲座） Seminar and Conferences (including seminars 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

学术学位博士研究生入学后，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

学术学位博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、博士生导师讲座，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 20 次以上的学术交流活动，其中博士生导师讲座至少 8 次，由本人做的公开的学术报告 1 次（开题报告、中期检查、预答辩、答辩不计入）。本人做的学术报告由指导教师负责对其学术报告效果进行考核。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，学术学位博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。

4. 科学研究

学术学位博士研究生应积极参加科学研究课题，并应具有在导师指导下独立负责某专题或子课题的研究工作经历。课题完成后由导师提出综合评审意见。

VI. Academic Activities

1. Study Proposal

The PhD students must prepare a study proposal on how they will complete the PhD 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

PhD students must participate in academic conferences, seminars by experts and PhD advisors, and discussion panels. Before their dissertation defense, PhD students must participate in seminars and

conferences over 20 times, including at least 8 seminars by PhD advisors, and deliver at least 1 academic presentation (the activities concerning with their dissertation are not counted). The presentations delivered by the PhD students will be evaluated by their own research advisors. All the seminars and presentations should be recorded in relevant record book.

3. Practice Activities

PhD 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.

4. Scientific Research

International academic PhD students should vigorously participate in scientific research projects, and shall be capable of conducting independent research on a particular topic or sub-topic under the guidance of their advisors. Their performance will be evaluated by their research advisors.

七、论文工作

学术学位博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《河海大学博士学位论文工作管理办法》和学院相关文件执行。留学博士研究生可使用英文撰写论文。

VII. Dissertation

The dissertations of academic PhD 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 PhD. Dissertation Management Measures” and relevant documents in College of Computer and Information. Dissertations 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. (美) 普雷斯曼 著, 郑人杰 等译, 《软件工程: 实践者研究方法》(原书第 7 版), 机械工业出版社, ISBN: 9787111335818
2. (英) 萨默维尔 著, 程成 等译, 《软件工程》(原书第 9 版), 机械工业出版社, ISBN: 9787111334989
3. (美) 佩腾 (Patton, R.) 著, 张小松 等译, 《软件测试》(原书第 2 版), 机械工业出版社, ISBN: 9787111185260
4. 伽玛 等著, 李英军 等译, 《设计模式可复用 面向对象软件的基础》, 机械工业出版社, ISBN: 9787111075752
5. (美) Martin Flower 著, 《重构: 改善既有代码的设计》, 人民邮电出版社, ISBN: 9787115221704
6. (德) 布施曼 等著, 袁国忠 译, 《面向模式的软件架构, 卷 1: 模式系统》, 人民邮电出版社, ISBN: 9787115332158
7. (美) Douglas Schmidt (德) Michael Stal (德) Hans Rohnert (德) Frank Buschmann 著, 《面向模式的软件架构, 卷 2: 并发和联网对象模式》, 人民邮电出版社, ISBN: 9787115332141
8. (德) 基歇尔, (印) 耆那 著, 袁国忠 译, 《面向模式的软件架构 卷 3: 资源管理模式》, 人民邮电出版社, ISBN: 9787115313430
9. (英) 休斯, (英) 考特莱尔 著, 廖彬山, 周卫华 译, 《软件项目管理(原书第 5 版)》, 机械工业出版社, ISBN: 9787111309642
10. ACM Transactions on Programming Languages & Systems, ACM, <http://www.acm.org/toplas>
11. ACM Transactions on Software Engineering Methodology, ACM, <http://www.acm.org/pubs/tosem>
12. ACM Transactions on Software Engineering Methodology, IEEE,

<http://www.Computer.org/portal/web/tse/home>

13. IEEE Transactions on Service Computing, IEEE, <http://www.Computer.org/portal/web/tsc>

14. Information and Software Technology, Elsevier,
<http://www.sciencedirect.com/science/journal/09505849>

15. Journal of Functional Programming, Cambridge University Press,
http://journals.cambridge.org/action/displayjournal_jid=JFP

16. Journal of Software:Evolution and Process, Wiley,
[http://onlinelibrary.wiley.com/journal/10.1002/\(ISSN\)2047-7481](http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)2047-7481)

17. Journal of Systems and Software,Elsevier <http://www.journals.elsevier.com/journal-of-systems-and-software/>

18. Requirements Engineering, Springer, <http://www.springer.com/computer/swe/journal/766>

19. Software and System Modeling Springer , <http://www.sosym.org/>

20. Software:Practice and Experience, Wiley, <http://www3.interscience.wiley.com/cgi-bin/jhome/1752>

21. Software Testing,Verification and Reliability,Wiley,Practice and Experience, Wiley,
<http://as.wiley.com/WileyCDA/WileyTitle/productCdSTVR.html>