



浙江大学
ZHEJIANG UNIVERSITY

COLLEGE OF CIVIL ENGINEERING
AND ARCHITECTURE

2016 Graduate Handbook
Department of Civil Engineering





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Introduction

Our College CCEA is located in Anzhong Building and Crescent Building on Zijiangang Campus.

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Our College CCEA is located in Anzhong Building and Crescent Building on ZijinThe College of Civil Engineering and Architecture (CCEA) at Zhejiang University is located in Anzhong Building and Crescent Building on the Zijingang Campus. CCEA consists of four departments, Civil Engineering, Architecture, Regional and Urban Planning, and Hydraulic Engineering, as well as 17 research institutes (centers). The college's predecessor, the Department of Civil Engineering, was established in 1927 as one of the first engineering programs at Zhejiang University. In 1958, the Department began offering an architecture program and in 1987, the program developed into the Department of Architecture. In 1990, the Department of Civil Engineering, the Department of Architecture and the Architectural Design Institute merged to form the College of Civil Engineering and Architecture. In 1998, four universities in the Zhejiang province merged to form Zhejiang University. Soon after, in 1999, the former Regional and Urban Science Department of Hangzhou University was added to further improve the discipline offerings of CCEA. In 2001, the Hydraulic Structure and Water Environment Research Institute of CCEA and the Department of Marine Science and Engineering of the College of Environmental and Resource Sciences merged to form the Department of Hydraulic and Ocean Engineering, ultimately being renamed to the Department of Hydraulic Engineering in 2010.

The CCEA currently offers doctoral programs in four first-level subjects, a Master's degree program in one first-level subject, and six professional Master's degree programs. We also offer a postdoctoral station in civil engineering and hydraulic engineering.

The faculty of the CCEA consists of 301 members, including 4 academicians, 69 professors (or research fellows), and 121 associate professors (or associate research fellows, etc). 65 of the teachers are eligible to sponsor PhD candidates, and 118 of the teachers are eligible to sponsor postgraduate students. Currently, there are 48 members who are engaged in post-doctoral research.





College Administration

The College of Civil Engineering and Architecture exercises the dean responsibility system.

College Administration

The deans and the deputy deans of the College of Civil Engineering and Architecture are top ranking university officials who carry out specific management tasks oversee the entire College of Civil Engineering and Architecture. The CPC Committee of the College plays an assurance and supervisory role over the CCEA. The important issues of the College concerning teaching, scientific research, personnel, finances, disciplinary construction, etc., are decided at the College’s Party and Administration Joint Meeting.

Academic departments are responsible for undergraduate course instruction. Research institutes are responsible for conducting scientific research, training graduate students, and further developing the disciplines, as well as undertaking the undergraduate course teaching tasks assigned by their respective departments.

Deans	Yaozhi Luo	+86-571-88208676	luoyz@zju.edu.cn
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	Chaofeng Lv	+86-571-88208660	lucf@zju.edu.cn
	Bin Zhu	+86-571-88208669	binzhu@zju.edu.cn
	Dansheng Dong	+86-571-87951656	13906523907@163.com
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	Huijun Fu	+86-571-88208690	hjfu@zju.edu.cn

➡ Department of Civil Engineering Leadership

Position	Name
Dean	Xiaoqian Qian
Deputy Deans	Shuifu Chen, Yuanfeng Duan, and Xuecheng Bian





Office of Graduate Studies

Office

of Graduate Studies

Position	Name	Contact Information	Job Responsibilities
Deputy chief	Linlin Lu	0571-88208680 linlinlu@zju.edu.cn	Overall coordination; document drafting; development planning; overall admissions; entrance examinations; development schemes; discipline building; international exchanges; discipline appraisal; and other duties.
	Haifeng Miao	0571-88208689 mhf@zju.edu.cn	Graduate defense applications; degree thesis/dissertation reviews; degree review applications; teaching performance assessments; advisor resource applications; excellent thesis/dissertation applications; and other duties.
	Yuhong Zhang	0571-88208689 zyh@zju.edu.cn	Enrollment status management; study guidance; enrollment reviews; course applications; course schedulings; examination arrangements; travel abroad applications; and other duties.





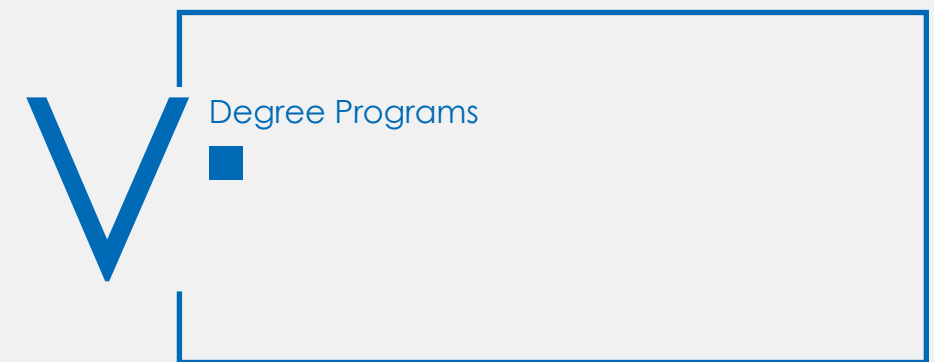
Online Resources



Online Resources

Frequently Used Websites	URL
Zhejiang University Main Website	http://www.zju.edu.cn/
College of International Education Zhejiang University	http://iczu.zju.edu.cn/
Graduate School of Zhejiang University	http://grs.zju.edu.cn/
Graduate Education Management System of Zhejiang University	http://grs.zju.edu.cn/
College of Civil Engineering and Architecture Zhejiang University	http://www.ccea.zju.edu.cn/
Civil and Hydraulic Engineering Research and Teaching Labs	http://ccealab.zju.edu.cn/
Zhejiang University Mail Services	http://mail.zju.edu.cn/
My ZJU	http://my.zju.edu.cn/
Zhejiang University Information Technology Services	http://networking.zju.edu.cn/
Campus Card Services Center	http://ecard.zju.edu.cn/
Zhejiang University Library	http://libweb.zju.edu.cn/libweb/
Zhejiang University Accounting & Finance Dep.	http://cw.zju.edu.cn/
Student Condos Zhejiang University	http://home.chinasinew.com/
Zhejiang University News	http://www.news.zju.edu.cn/index.php/
China Academic Degrees & Graduate Education Information	http://www.cdgd.edu.cn/
China Higher Education Student Information and Career Center (CHESICC)	http://www.chsi.com.cn/
CC98 Forum	http://www.cc98.org/
Freecity	http://www.zju88.org/
Career Information	http://www.career.zju.edu.cn/





Degree Programs

➔ Doctorate in Philosophy (PhD) Programs

Program: Full-time
Average Length of study: 3-5 years

Discipline	Field Specialization	Degree-granting
Civil Engineering	Geotechnical engineering	PhD in Engineering
	Structural engineering	PhD in Engineering
	Municipal engineering	PhD in Engineering
	Disaster prevention and reduction engineering and protective engineering	PhD in Engineering
	Bridge and tunnel engineering	PhD in Engineering
	Roads and transportation engineering	PhD in Engineering
	River and coastal engineering	PhD in Engineering
	Water resources and environmental engineering	PhD in Engineering
	Hydraulic structure and port engineering	PhD in Engineering



PhD Program Advisors List
<http://yjsds.zju.edu.cn/daoshiInfoList.jsp?cid=525>

➔ Master's of Science (MS) Programs

Program: Full-time
Average Length of study: 2.5 years

Discipline	Sub-discipline	Degree-granting
Civil Engineering	Geotechnical Engineering	Master's of Science in Engineering
	Structural Engineering	Master's of Science in Engineering
	Municipal Engineering	Master's of Science in Engineering
	Disaster Prevention and Reduction Engineering and Protective Engineering	Master's of Science in Engineering
	Bridge and Tunnel Engineering	Master's of Science in Engineering
	Heating, Gas Supply, Ventilating and Air Conditioning Engineering	Master's of Science in Engineering
	Rivers and Coastal Engineering	Master's of Science in Engineering
	Water resources and environmental engineering	Master's of Science in Engineering
	Hydraulic Structure and Port Engineering	Master's of Science in Engineering
Management Science and Engineering	Engineering management	Master's of Management

➔ Master's of Engineering (ME) Programs

Majors	Degree-granting
Architecture and Civil Engineering	Master's of Engineering
Hydraulic Engineering	Master's of Engineering
Traffic and Transportation Engineering	Master's of Engineering
Engineering Management (Civil Engineering Management direction)	Master's of Engineering Management



Master's Program Advisors List
<http://yjsds.zju.edu.cn/daoshiInfoList.jsp?cid=525>



Frequently Asked Questions

When do I need to do the
registration?
...

Frequently Asked Questions

Q1: When do I need to do the registration?

A: Graduate Students must register for each semester at the Office of Admission and Management International College. The registration period is held at the beginning of Spring Semester (late February or early March) and Fall Semester (early September or Mid-September). Please refer to the University Academic Calendar for registration dates and deadlines. Graduate students are required to bring their student ID pamphlet as well as their passports to the Office of Admissions and Management International College and complete registration procedures to be registered for the new semester.

Graduate students who are not able to register by the normal registration period should apply for delayed registration in advance. A late-registration application form should be filled and submitted to the Office of Admission and Management International College. The application will not be valid until the approval is granted.

Q2: How do I request a leave of absence?

A: Graduate students who wish to request a leave of absence (not exceeding 30 days) should contact the Office of Admission and Management International College and fill out the “Leave of Absence Form for Graduate Students”. The leave of absence form should be submitted to the Office of Admission and Management International College before the requested leave date, as the request will not be valid until approval is granted. For leave of absence requests lasting up to 7 days, approval from a program advisor is required. For leave of absence requests lasting more than 1 week but not exceeding 30 days, approval from a program advisor, a director of the college graduate office and a director of the department is required. For students who wish to request more than 30 days leave of absence, please request a temporary suspension of schooling.

Q3: How do I request temporary suspension of schooling?

A: Graduate students who are unable to attend class or school for more than one month, because of medical treatment, illness or other extenuating circumstance, should request a temporary suspension of schooling. The duration of this suspension cannot exceed 2 years. Students should contact the Office of Admission and Management International College, and fill out the “Student Status Change Application Form for Graduate Students”. The request will not be valid until the approval is granted. Approval

from a program advisor, a director of the college and a director of the department are required. Meanwhile, proof of medical diagnosis should be provided if illness or medical treatment is the primary reason for the request. Students must resume their study after the expiration of the temporary suspension by filling and submitting another “Student Status Change Application Form for Graduate Students” to the Office of Admission and Management International College.

Q4: How does Zhejiang University evaluate my progress?

A: The university conducts an academic progress reviews for current students each semester. Students need to fill out the “Study Review Form” at the end of every semester, which will then be evaluated by an advisor and a director of the college. After evaluation it will be submitted to the Office of Admission and Management International College.

Q5: How do I extend my graduate program?

A: Graduate students who are unable complete their enrolled programs within the prescribed time and wish to extend their programs, must submit the “Study Period Extending Application Form for Postgraduate Students, ZJU” to the Office of Admission and Management International College six months before their program time frame ends. Approval from an advisor, a director of the college graduate office and a director of the department is required. Requests will not be valid until approval is granted.

Q6: How do I extend my residence permit?

A: Graduate students should extend their residence permit before it expires at the Office of Admission and Management International College. Students must first prepare the following documents: residence registration certificate (issued by the dormitory office or the local police station), proof of tuition fee payment (self-funded students) and passport. With the certificate issued by Office of Admission and Management, the residence permit can be extended at the Hangzhou City Police Entry/Exit Administration Bureau. (Address: Hangzhou City Police Entry/Exit Administration Bureau, 35 Huaguang Road, Tel: 87071973).

Q7: How can I receive my diploma after I have passed my oral defense?

A: After passing the oral dissertation defense, qualified graduate students need to contact the Office of Admission and Management International College to begin the process of graduation. Students first need to fill out the “Deregistration Procedure Form for Postgraduate/Visiting Students Leaving the University”, and submit it to the Graduate Office. The request will not be valid until approval is granted. Graduate students qualified for graduation shall be granted the degree certificate by their college/department. Graduate students who are allowed to conclude their studies shall be granted a graduation diploma by the International College.

Q8: How do I get medical insurance if I am ill?

A: Full-scholarship students, students with scholarships that cover medical expenses, and self-funded students who have paid in full the annual tuition fee (with their length of

enrollment exceeding 6 months), are entitled to to enroll in the Comprehensive Medical Insurance for International Students program. Please refer to the introduction and specific details on the official insurance website (www.lxbx.net), as well as the Insurance Chapter of the "International Student Handbook of Zhejiang University". Graduate students seeking reimbursements should contact their teacher who is in charge of student insurance affairs. (Office Address: Room 219, Dorm. 31, Yuquan Campus, Zhejiang University, Tel: 87953837)

Q9: How can I apply for living off-campus?

A: Graduate students that wish to live off-campus should fill out and submit the "Application for Off-campus Accommodation" form, as well as related materials, such as the lease agreement etc., to the Office of Admission and Management International College. The request will not be valid until the approval is granted. After approval is granted, students can live off-campus. Within 24 hours after move-in, students should go to the local police station with their passport to complete their residence registration. Afterwards students must bring the residence registration certificate to Office of Admission and Management International College.

Q10: My parents/relatives/wife/husband will come to China for a visit, could the university offer an invitation letter?

A: The university does not issue invitation letters for students' family members or friends, as the inviters are the student themselves, not the university. What the University does offer are student status verification forms, and other related certificates. Family members can apply for a visitor's visa at the Embassy of People's Republic of China with these documents. Graduate students need to bring photocopies of passports of family members, official marriage certificate, birth certificate etc. to the Office of Admission and Management International College in order to start this process. (Contact: Mr. Tang, Location: Room 231, Dorm. 31, Yuquan Campus, Zhejiang University)

After the arrival of students' family members, graduate students and family members are required to complete residence registration formalities according to university regulations. Graduate students will need to pay a residence fee if their relatives need to stay on campus.

Q11: When and how will I receive my scholarship stipend?

A: On the 1st of every month, the scholarship stipend will be transferred to students' Bank of China cards. Students will receive the scholarship stipend for February and August in advance. After registering at the university, new graduate students will need to go to the Bank of China (Zheda Branch) with their passports to open their own bank account. Card/Account information will then need to be reported to the Office of Admission and Management International College.

Graduate students can also authorize Office of Admission and Management to open a bank account for them. For this option, graduate students will need to offer the Office of Admission and Management a photocopy of their passport. Graduate students collect and

activate their cards with their passport or the certificate of issued passport (students who are in the process of residence permit application may not have their original passports) at the Bank of China Zheda Branch. Please contact Mr. Tang for detailed information. (Office: Room 231, Dorm. 31, Yuquan Campus, Zhejiang University).





VI

Registration

All international students must apply through the International Education College.

Registration

All international students must apply through the International Education College.(<http://iczu.zju.edu.cn/english/>)

➞ New Student Registration

New students must register within the specified time at the International Education College, Zhejiang University, bringing with them their passports, Letter of Admission and Form JW201 or JW202. During registration, they will be asked to fill out the “International Students Admission Form”, take home a copy of the Handbook for International Students, and submit other necessary documents for verification as designated in the Letter of Admission. They also need to submit 4 passport photos (2x2” portrait with a white background). Postgraduate students and upper-level non-degree students pursuing studies other than the Chinese language and culture must also register in the schools and colleges where their academic programs are conducted.

When registering, self-funded students must provide receipts of tuition and fee payments or bank statements showing proof of payment. They may also make the payment in person at the time of registration.

- Those who are not able to register within the specified time period must obtain prior consent from the International Education College for later registration.
- Failure to register within two weeks after the specified deadline without valid reasons will automatically be regarded as forfeit of admission eligibility.
- The Letter of Admission for international students shall bear the official seal of the International Education College, Zhejiang University. No other documents issued by any organizations or individuals are valid and will not be accepted.

➞ Current Student Registration

Current students must register at the International Education College within the specified period at the beginning of each semester. They will need to bring their student books and passports. Once the passport number and the date of their residence permit have been validated, a registration seal will be stamped onto their residence permit.

Additionally, students need to be registered in the Graduate School Management System.

Chinese Government Scholarship students and Confucius Institute students must sign their names on the registration form of scholarship students. Those who are not able to register within the specified period for some reason must request in advance permission for later registration, or else they will be treated as truants. Failure to register within the two weeks after the specified deadline without permission will automatically lead to the cancelation of their student status.

➞ Regulations on Management of International Graduate Student Status

The regulations will be implemented according to the Zhejiang University Rules for International Student (Graduate) Enrollment Status Administration and Zhejiang University Implementing Measures for Postgraduate Enrollment Status Administration. For details, see the Zhejiang University College of International Education Graduate Handbook.



<http://iczu.zju.edu.cn/attachments/2015-12/01-1450305168-7326.pdf>

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0571-88208689 zyh@zju.edu.cn



VIII

Coursework

All international students must apply through the International Education College.

Coursework

Program Plans

To ensure the quality of graduate education for international PhD and Master's degree students, Zhejiang University assigns a faculty member or advisory committee with the faculty member playing the main advisor role. The advisor (or the advisory committee) will be responsible for making and modifying the graduate student's plan of study, arranging book reports and research proposals, guiding research, dissertation writing and similar matters.

For international students who have registered in programs with Chinese as their working language, as specified in their Acceptance Letters, their dissertations must be written in Chinese. For those who have registered in programs with English as the working language, their dissertations can be written in English, but the abstracts must be written in Chinese.

→ Time Frame for Graduate Studies

PhD candidate: 3.5 years

Academic Master's candidate: 2.5 years

Professional Master's candidate: 2.5 years

Zhejiang University follows a quarter system for each academic year and a course credit system for graduate studies. It is important that students plan accordingly, under the guidance of their advisors, their time for course studies according to their research needs and dissertation writing. Students must complete sufficient credits before their thesis defense. In normal cases, students will complete their course studies in the first year of their graduate study.

→ Program Requirements for PhD Candidates

Course requirements

A minimum of 14 credits is required for doctoral programs, of which supplemental papers account for 2 credits.

- “Chinese Language” (Required Course): 2 credits
- “China Overview” (Required Course): 2 credit

- Specialized Degree courses: A minimum of 2 credits
- Elective Courses: PhD Candidates are required to select a one foreign language course (1 credit). They must also take elective courses related to their specialized programs (2-5 credits), such as common courses offered at the university level or crossdisciplinary graduate courses. If necessary, with the consent of their college and programs, they can take new courses on novel topics related to their dissertation writing. These courses must be defined in students' plan of study created with their faculty advisor.
- Supplemental Papers: 2 credits

PhD Candidate are required to write and present academic level papers analyzing a relevant text or seminar at least 6 times during their doctoral studies. At least 1~2 papers must be presented at the academic forums organized by their disciplines or colleges. The total of the 6 presentations will count for 2 credits.

→ Scientific Research and Dissertation

The majority of PhD candidates' work consists of scientific research and completing their dissertations during their graduate programs. The topics of their dissertations should be relevant to the current research areas and conditions with the approval of the advisors/ advisory committee, with ample theoretical and practical significance, furthering the innovation and advancement of the discipline.

The dissertation proposal is an important step of the PhD candidate's work. The time for dissertation proposal writing can be determined according to the progress of the PhD candidate's research, but it must be no later than the end of the students' second year of graduate studies. PhD candidates will not be able to apply for the dissertation defense unless they have already had their research papers published at the time of application.

→ Program Requirements for Master's Degree Candidates

Course Requirements

A minimum of 26 credits is required for Master's degree programs, 2 of these credits must be earned through supplemental papers.

- “Chinese Language” (Required Course): 2 credits
- “China Overview” (Required Course): 3 credits
- Specialized Degree courses:

A minimum of 6 credits must be earned by taking courses of the student's current first-level discipline, methodology courses or college common courses.

- Elective Courses

These courses refer to those of the students' fields or the related fields that are offered to broaden the students' knowledge base or deepen their understanding. The courses fall into 3 categories, namely degree courses of the students' fields, university-wide common courses, and cross-disciplinary courses.

Master's degree students should acquire at least five credits for optional courses of their fields of studies. Master's degree students are required to select at least one common course.

● Supplemental Papers

Master's degree students are required to write and present academic level papers analyzing a relevant text or seminar at least 4 times during their graduate studies. At least one of these papers must be presented at the academic forums organized by their disciplines or colleges. A total of 4 presentations will count for 2 credits.

➡ Program Requirements for Professional Master's Candidate

Credits required

A minimum of 26 credits is required, of which common courses account for five, specialized degree courses account for 10, and optional courses account for nine (a Professional Master’s candidate must have five credits for optional courses, at least with one from humanities courses), book reports account for two, and project-based courses take up two. (In the case where a Professional Master’s candidate participates in at least 12 months of training and project-based research in a relevant field in combination with his/her research subject, he/she can, by combining concentrated and phased methods, make a project-based practice report at the end of participation, which will be signed by the project owner together with their evaluation. On a 100-point scale, the advisor can translate the project-based courses into course credits.

For the specific plan of studies in each discipline, please visit



<http://grs.zju.edu.cn/py/common/pyfagl.htm>

Course Registration

- In My Courses found at <http://my.zju.edu.cn/>, you can view your course progress, including all the courses in your plan of study and elective courses outside of the plan of study.
- If you were unable register for the courses according to your plan of study, these courses can be taken at another time; or you can, under direction of your advisor or the Graduate Department of your college, adjust your plan of study and select other courses.
- Timeline for Course Registration

Stage	Time for Course Availability	Course Available for Selection
Initial Registration	From middle of Summer or Winter break in each academic year to week 0	You may only register/cancel the courses for the following Fall/Winter (Spring/Summer) quarters
Registration/ Cancellation of additional courses	From week 1 to week 2 of the Fall or Spring quarter	You may only register/cancel the courses for the following Fall/Winter (Spring/Summer) semester
Registration/ Cancellation of elective courses for winter (summer) quarter	From week 9 of the Fall or Spring quarter to week 2 of the Winter or Summer quarter	You may register/cancel for elective courses for the Winter/Summer semester but may not register/cancel elective courses for the Fall/Spring quarter or the consecutive courses for the Fall/Winter (Spring/Summer) semester

Scan the above two-dimensional barcodes to learn about instructions on online graduate course selection.



Chinese
http://grs.zju.edu.cn/redirect.php?catalog_id=10032&object_id=106110



English
<http://iczu.zju.edu.cn/attachments/2015-12/01-1450305168-7326.pdf>

Examinations and Tests

Graduate candidates must participate in assessments for all selected courses and at various teaching stages. The assessments consist of examinations and tests. The graduate candidate assessments come in the forms of examinations in writing, oral examinations, open-book examinations, close-book examinations, papers, etc. For specifics, see the requirements of the course instructors. Examination arrangements and results can be checked two weeks ahead in the Graduate Student Management System.

Those who fail to pass a degree course must retake the course, and those who fail to pass a non-degree course may retake the course or select another non-degree course.

Point of Contact:

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Graduate Development

Graduate Thesis/Dissertation

➞ Thesis/Dissertation Criteria

Purpose: The purpose of the thesis/dissertation must include the following:

- The significance of the research project.
- Current state and analysis of the research area domestically and internationally.

Research Design: The design of the dissertation research to be conducted must include the following:

- Objective and content of research as well as key issues addressed.
- Research method, technical path, and experimental procedure to be used as well as research feasibility analysis.
- Originality of the research and expected achievement in the field of study.

Research Content:

- Original research work accumulated relevant to this project and research achievement already completed (separately listed if they have been made by the candidate).
- Experiments, materials, and other sources.
- Limitations of the research and calls for future study.

➞ Thesis/Dissertation Proposal Submission and Review

Candidates must, at the end of the first academic year and according to Zhejiang University Graduate Candidate Degree Thesis/Dissertation Report (Attachment One), write a thesis/dissertation proposal and submit it to their research advisor. Once the advisory committee composed of their advisor and (at least three other members) has approved the proposal, then the candidates may begin working on their thesis/dissertation.

After uploading the approved proposal to the Graduate Education Management System, they may submit it to their advisor for online review and approval. If the proposal is not approved, candidates must submit a new proposal in the timeframe as specified by the college or discipline. If the degree thesis/dissertation subject needs to be changed under special circumstances after the proposal has been approved, the candidate has to submit another thesis/dissertation proposal.

➞ Supplemental Papers

Master's Candidate

- A Master's candidate must complete four supplemental papers in a semester, completing at least one paper for the discipline or College's forum or delivering a report at a national or international academic conference; two credits are granted for four reports made accumulatively.
- A candidate must attend at least three academic report conferences organized by the College per year.

Regular PhD Candidate

- A PhD candidate must complete six supplemental papers in a semester, completing at least one to two papers for their discipline or College's academic forum or presenting one to two papers at a national or international academic conference; two credits are granted for a cumulative of six reports.
- A candidate must attend at least four academic conferences organized by their College per year.

➞ Mid-term Assessment

This assessment is conducted according to the rules of the College of International Education. For details, please see the Graduate Handbook of College of International Education.



<http://iczu.zju.edu.cn/attachments/2015-12/01-1450305168-7326.pdf>

➡ Mock Thesis/Dissertation Defense

- The mock defense is carried out within the discipline, which is judged by a review panel (of at least three members) composed of the advisor and the advisory team members.
- The application for mock defense is made in the timeframe as specified by their respective department (institute). The application process is outlined below:
 - 1) The mock defense application form and other relevant information can be found on the Graduate School’s Education Management System.
 - 2) Applicants submit their mock defense application form and a copy of the degree thesis/dissertation to the review panel. They will also need to post a notice for the mock defense.
 - 3) After passing the mock defense, applicants record the feedback of the review team in the system and submit it to their advisor to review online in the system.
 - 4) If applicants fail to pass the mock defense, they will need to apply for another mock defense as specified by the department. Under the guidance of their advisors, they will need to incorporate the feedback from the review panel and revise the issues with their research and thesis/dissertation.

Graduate Thesis/Dissertation

➡ Graduation Requirements

- **Standard Graduation:** PhD or Master’s candidates can apply for standard graduation once they have passed the courses according to their plan of study and other assessments, successfully passed their thesis/dissertation defense and overall performance meets academic and ethical standards;
- **Early Graduation:** PhD or Master’s candidate can apply for early graduation if they have met the succeeded passing their thesis/dissertation defense
- **Completion:** PhD or Master’s candidates are issued a certificate of completion if the candidates have passed the assessments for the courses specified in their plan of study but failed to pass their degree thesis/dissertation defense. If candidates are permitted by the defense committee to revise their thesis/dissertation, they may, within the time specified, apply to the University for another defense attempt. If they pass the defense, they will be eligible to graduate.
- **Incompletion:** PhD or Master’s candidates are issued a certificate of incompletion if they pass the examinations for the courses specified in their plan of study for one year or more but fail to complete other studies.

Point of Contact:

Name	Office	Contact Info
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Miao Haifeng	A341, Anzhong Building, Zijingang Campus, Zhejiang University	0571-88208689 mhf@zju.edu.cn

Theses/Dissertations

➡ Basic Requirements for PhD Dissertations

The PhD dissertation is the culmination of the candidates’ achievement at the PhD level, indicates that the PhD candidate has grasped a solid, extensive foundational theory and systematic, in-depth professional knowledge and acquired the ability to conduct scientific research independently.

Requirements for Subject Selection and Literature Review

Subject Selection

- The subject selected for the dissertation must be significant both practically and academically and must be aligned with the needs of national development.
- The dissertation will usually address complex issues in the field of civil engineering.
- The dissertation subject must seek to break new ground and provide novel insights through research to help advance the field of civil engineering.
- The subject must be practical in that the objective proposed in the dissertation can be accomplished in a reasonable amount of time and resources.
- Subject selection emphasizes innovation, in other words, the subject selected must be novel in the development direction of the discipline and the author will be able to create independent and original work.

Literature Review

- For the literature review, PhD candidates will need to thoroughly outline the current status and development of the selected subject. The literature review will need to cover both domestic and international statuses. The review also requires objective and critical comments on relevant academic views and achievements while avoiding being overly critical or simplifying for justifying their own viewpoints.

- The literature review will need a comprehensive collection of reference literature to the selected subject. This is accomplished through careful selection, reading, and summarization.
- By fully grasping the current status, applicants can have a deeper understanding of where developments may lead. This allows applicants to have the foundation to accurately come up with scientific questions and create a practical research project.
- The literature review must follow ethical academic practices and avoid clustering articles, manipulating the text, failing to address conflicts in research and other faults.

Thesis/Dissertation Format

A dissertation must present a complete introduction to the author's research achievement, featuring academic viewpoints, reliable data, evidence-backed hypotheses and conclusions. PhD candidates must, as required by their research advisor and dissertation subject, complete the following work after systematic training and development:

- 1) Thesis/Dissertation Proposal: Candidates must complete a dissertation report and hold a dissertation proposal meeting. The proposal meeting will cover the research objective, technical route and method, main content of research, characteristics and difficulties, expected result and possible creative points.
- 2) Qualification review: This review is conducted at the end of course studies and the dissertation report meeting, especially of a direct PhD candidate or a candidate in a combined Master's-PhD program.
- 3) Thesis/Dissertation Content: The dissertation must fully reflect the author's ability to conduct independent research and make original contribution to their field of research. Meanwhile, attention must be paid to the standardization of the symbols, technical terms, data representations, citations, and footnotes in the dissertation.
- 4) Academic papers: Candidates must submit high-level academic papers that are published or under-review, which must be closely related to the contents of their research.

A dissertation must comply with the basic formats required by the state and the degree-awarding institution. Please reference the Graduate Thesis/Dissertation Writing Rules of Zhejiang University document and relevant resources on academic standards. The content, layout, language, graph, citations, and footnotes must clearly follow the standards outlined by these documents. Dissertations must be logically written, conceptually clear, well structured, and correctly formatted. A dissertation usually includes a cover, an abstract in Chinese and one in English, table of contents, glossary, the body text, bibliography, appendices, and acknowledgement.

Originality of Achievement

Candidates must present their own points of view and demonstrate original contribution of significant knowledge and ideas in their research content. Their research usually explores a complex issues in the civil engineering field. Original contribution includes proposing a new method, theory, or correction of some major fault in previously held views in the civil engineering field, contributing to the field's overall direction. Candidates must be able to demonstrate distinguished accomplishment and high critical ability in their work.

➔ Mock Thesis/Dissertation Defense

A Master's degree thesis, as a culmination of the research achievement made at the Master's level, must strictly meet academic and quality standards.

Standardization Requirements

A Master's degree thesis must comply with the basic formats required by the state and the degree-awarding institution. Please reference the Graduate Thesis/Dissertation Writing Rules of Zhejiang University document and relevant resources on academic standards. The content, layout, language, graph, citations, and footnotes must clearly follow the standards outlined by these documents. Dissertations must be logically written, conceptually clear, well structured, and correctly formatted. A dissertation usually includes a cover, an abstract in Chinese and one in English, table of contents, glossary, the body text, bibliography, appendices, and acknowledgement.

Quality Requirements

A Master's degree thesis for the civil engineering discipline must clearly demonstrate significant achievement made by the author, specifically:

- 1) A Master's degree thesis is completed independently under the guidance of their advisor. Candidates must commit to the thesis for at least a year.
- 2) The thesis' topic must be theoretically or practically significant, such as discovering a new phenomenon, pattern, material, etc. in the field of civil engineering. The thesis can propose a new theory or method. It can also refine original techniques, methods, and processes in areas of civil engineering such as planning and construction.
- 3) The thesis must also indicate that a candidate has extensively read relevant literature, while the literature review must have a clear description and analysis of the status quo domestically and internationally.
- 4) The thesis must contain analysis and research of scientific search subjects and complex engineering problems by integrating foundational theories and professional knowledge and technical achievement through experimental and data simulation. The research must follow reliability and validity measures while

- 5) The thesis must be written in a conceptually clear, logical and structured manner.

➡ Basic Requirements for Professional Master's Degree Thesis

A Professional Master's degree thesis, as a culmination of the research achievement made at the Master's level, must meet academic and quality standards.

Standardization Requirements

A Professional Master's degree thesis must comply with the basic formats required by the state and the degree-awarding institution. Please reference the Graduate Thesis/ Dissertation Writing Rules of Zhejiang University document and relevant resources on academic standards. The content, layout, language, graph, citations, and footnotes must clearly follow the standards outlined by these documents. Dissertations must be logically written, conceptually clear, well structured, and correctly formatted. A dissertation usually includes a cover, an abstract in Chinese and one in English, table of contents, glossary, the body text, bibliography, appendices, and acknowledgement.

Quality Requirements

A Master's degree thesis must demonstrate clear and significant achievement. This includes:

- 1) Scientific discovery: Discovering a new phenomenon, pattern, material, etc. in the field of civil engineering.
- 2) Theoretical innovation: Proposing a new theory or method in the field of civil engineering.
- 3) Technical reform: Refining original techniques, methods, or processes in civil engineering planning, design, construction, etc.
- 4) Technological application: Promoting the application of new technologies, materials, processes, and equipment. Providing socioeconomic value or other achievements that add value to the civil engineering field/industry.

Theses/Dissertations

According to the Implementing Methods for Graduate Degree Thesis/Dissertation Defense and Degree Application of Zhejiang University issued by Zhejiang University Graduate School, Master's/PhD candidates must publish academic papers in scientific research or in the professional field. Based on Clauses Three and Eight of this document, the following standards apply:

College of Civil Engineering and Architecture Standards for Graduate Degree Publication Papers (Effective as of the 2015 Class)

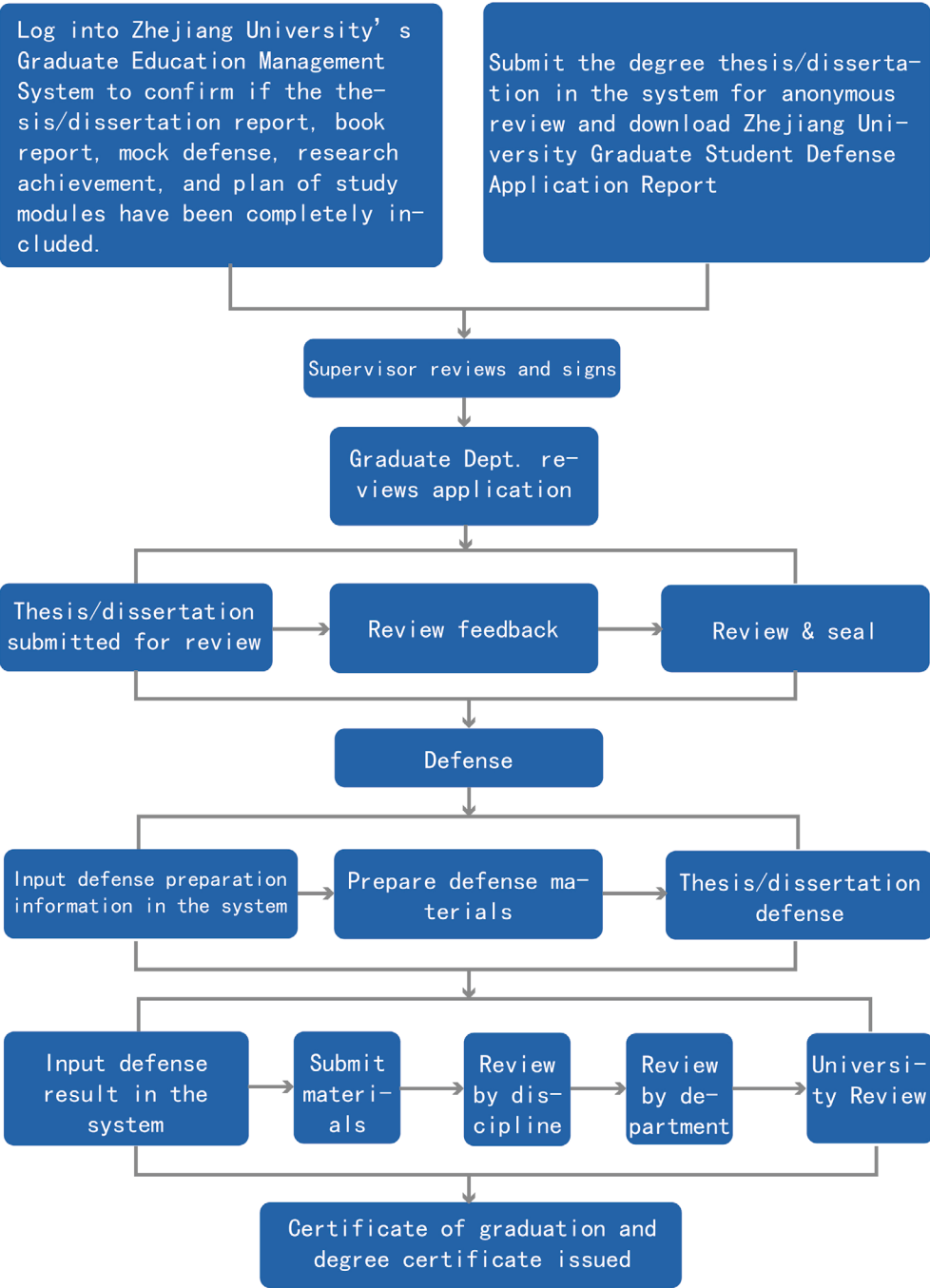
Level-1 Discipline	Level-2 Discipline	Master's	PhD
Civil Engineering	Geotechnical engineering	One paper published on a level-1 journal or included in the EI. If published on a supplement, it needs to be included in the EI.	Either of two (papers on journals): One included in the SCI, one in the EI, and one on a core publication; Two included in the SCI.
	Structural engineering	One paper published on a core publication or higher	
	Municipal engineering		
	Disaster prevention and mitigation engineering and preventive engineering		
	Heat supply, gas supply, ventilating, and air-conditioning engineering		
	Bridge and tunnel engineering		
	Marine structures and the environment		
	Road and transportation engineering		
Hydraulic Engineering	Hydrology & Water Resources	One paper published on a core publication or higher	----
	Hydraulics & River Mechanics		
	Hydraulic structure engineering		
Transp. Engineering	Road & railway engineering	One paper published on a core publication or higher	----
	Transportation planning & management		
	Traffic information engineering & control		
Master's of Engineering	hydraulic engineering	One paper published in a core publication or higher/ An invention patent verified at a provincial or ministerial level (top five)	----
	transportation engineering		
	architecture & civil engineering		
	engineering project management		

- Notes:
- 1) For the expanded directory of journals for engineering graduates, see Doc. No. 12 (2009) issued by the Department of Engineering;
 - 2) An invention patent or a paper read at an international conference included in one of the three major indices are equivalent to one paper published on a core publication.
 - 3) A published article is one published or included in one of the major indices, whose content must be relevant to that of the corresponding thesis/dissertation.
 - 4) In rare cases, the advisor applies an achievement of an equivalent standard is provided; after discussion and approval by the College's discipline committee, the thesis/dissertation standards can be adjusted, but the adjusted standards must not be lower than those designated by the University.
 - 5) These standards are effective from the 2015 class.

Applying for Thesis/Dissertation Defense

Master's or PhD candidates may apply for a degree thesis/dissertation defense for respective degrees according to the Implementing Methods for Graduate Degree Thesis/ Dissertation Defense and Degree Application of Zhejiang University if they have, within the specified timeframe, passed the examinations and assessments required in their plan of study, completed their degree thesis/dissertation, met the University's requirements in terms of research achievements, and obtained approval from their advisor. Applying for the thesis/dissertation defense and applying for degree completion should occur in January, April, July, or October. Please refer to the "Thesis/Dissertation Defense" section of each College's website.

➡ Procedures



➡ Application for Pending Thesis/Dissertation Defense

- If Master's/PhD candidate did not published their research achievement during the course of their graduate work but their degree thesis/dissertation has attained the development objective, they can ask for a recommendation from their advisor and for approval by the director of the discipline degree committee. Afterwards they can submit it to the University's degree office for processing. If candidates pass their thesis/dissertation defense, they can still apply graduation from their program, but they cannot apply for a degree.
- Candidates who pass their degree thesis/dissertation defense but do not qualify for a degree have the option to publish a research achievement within three years for a degree. The research achievement meeting the University's requirements and candidates need to apply to the Civil Engineering and Architecture discipline degree committee for their degree.

➡ Application for Early Thesis/Dissertation Defense

Type	Required Course Scores	Required Published Articles
PhD candidates	GPA exceeding a grade of B- for all courses. A minimum of a C- grade on any degree course.	(1) Win national first or second prizes (top five) for research achievement or provincial/ministerial first and second prizes for research achievement (top two). (2) Publish three academic papers or more on a top-three journal in their discipline.
Master's candidate	GPA exceeding a grade of B- for all courses. A minimum of a C- grade on any degree course.	Publish at least one academic paper top-three journal in their discipline.

- Notes:
- 1) The articles published must list Zhejiang University as the signature institution of the first author and the writing Master's/PhD candidate as the first author, or the research advisor as the first author and the Master's/PhD candidate as the co-author.
 - 2) Two invention patents granted can be regarded as one academic paper published on a top academic journal.

➡ Thesis/Dissertation Application Procedures

- 1) Candidates must provide letters of recommendations from two professors or experts of equivalent levels (one must be their advisor). The letters must clearly state the recommendation reasons such as creative achievement.
- 2) Applications must be filed two months ahead of the expected date of defense.
- 3) After filling out Zhejiang University Graduate Application for Defense in Advance, applications are submitted along with the recommendation letters and thesis/dissertation (five copies for a PhD candidate and three for a Master's candidate) to the Graduate Education Department of the College.
- 4) After the Graduate Education Department of the College has reviewed the application materials and approved by the person in charge, the college will invite a team of at least three experts (excluding applicant's advisor) to review the materials and decide if they meet the requirements for an early thesis/dissertation defense. The materials eligible will then be submitted to the Graduate School.
- 5) After reviewing the application materials, the Graduate School will submit them to the president in charge for approval.
- 6) The review for an early thesis/dissertation defense will be organized by the College and conducted anonymously. If the results of review by the experts are excellent or above, the applicant can continue their early defense. If an expert involved in the review considers that a major revision is required before the defense continues, the procedure for the early defense will be terminated.

Scan the following two-dimensional barcode for Master's thesis defense



http://www.ccea.zju.edu.cn/redir.php?catalog_id=174&object_id=2761

Scan the following two-dimensional barcode for PhD dissertation defense



http://www.ccea.zju.edu.cn/redir.php?catalog_id=174&object_id=2760

Thesis/Dissertation Review and Defense

➡ Thesis/Dissertation Review

PhD candidates:

Prior to the defense, experts inside and outside the University are organized to review the dissertation. Those involved in the review must be experts with a senior qualification in a field or discipline relevant to the dissertation and a team of at least five such experts is needed (at least four from outside the University, at least three of which are doctoral advisors). Three of the dissertation copies must be reviewed anonymously.

At the end of the review, if two of the review team experts consider that the dissertation does not meet the defense requirements or the overall grade is poor (E), or if one of the review experts gives a poor overall grade (E) while another gives an overall passable grade (D), the defense application procedure will be terminated.

If one of the experts considers that the dissertation fails to meet the requirements and should not proceed to the dissertation defense or it calls for a major revision, the dean in charge or the director of the discipline degree committee will consider the matter comprehensively based on the specific review opinions of other review team members to decide if the defense application procedure will continue.

If approval is granted for the procedure to continue, the PhD candidates must carefully revise their dissertations based on the experts' opinions before submitting it to the review team experts for another review. If dissertations are considered eligible after the second review, the dissertations defense can be conducted, otherwise the defense application procedures will end. All the experts' letters of review must be sent to the defense committee before the defense happens.

Master's candidate:

Prior to the defense, experts inside and outside the University must be brought in to review the dissertation. Those involved in the review must be experts with an associate senior qualification in a field or discipline relevant to the degree dissertation and a team of at least three such experts is needed (at least one from outside the University). One of the copies must be reviewed anonymously. At the end of the review, if all review experts approve of the defense, then the defense will take place. If two or more of the review team experts disqualify the thesis, then the defense will not take place and the defense application procedure will end. If only one of the review experts disqualifies the thesis and if the director of the discipline degree committee approves this, one more expert can be brought in to review the thesis. If this expert approves of the thesis, then it can proceed to the defense stage, otherwise no defense will take place and this defense application procedure will end. After the procedure ends, the applicant must improve and revise

the thesis; with the approval of his/her advisor he/she can submit it for another defense application. All the experts' letters of review must be sent to the defense committee before the defense happens.

Master's candidate:

- 1) The defense committee must be ethical, fair, scientific, objective, and uphold the best academic standards to ensure the fairness and quality of the process and the result.
- 2) The defense will be open. However, the contents of the degree thesis/dissertation are kept confidential. Candidates, under guidance of their research advisor, prepare the applications. After the Science and Technology Department of the University approves the application, the confidentiality committee of the College and the dean in charge of graduate education needs to approve the application. Afterwards the application will be submitted to the degree committee's office of the University for filing. The degree thesis/dissertation defense must be hosted by a defense committee composed of experts inside and outside the University.
- 3) The specific thesis/dissertation defense is conducted pursuant to the requirements in the Implementing Methods for Graduate Thesis/Dissertation Defense and Degree Application of Zhejiang University (ZUFY Doc. No. 48)

Degree Awarding

Master's and PhD candidates may apply for completion of their degrees if they support the leadership of the CPC and socialism. They must be patriotic and active in serving socialist modernizations, and highly moral and law-abiding. This is pursuant to Clause 11 in Chapter Four in Zhejiang University Degree Conferment Measures (ZUFY Doc. No. 37 2004). Candidates may not apply to any other degree-awarding institution at the same time.

Applicants must pass all the degree course examinations and their thesis/dissertation defenses. All of their graduate work must be reviewed and approved by the degree committee before qualifying for graduation and degree awarding.

➔ Conditions for Master's Degree Awarding

Master's Degree recipients must:

- 1) Master the basic theory of Marxism.
- 2) Acquire a solid foundational theory in their discipline and systematic knowledge of their field.

- 3) Provide, in their Master's degree thesis, new insight into the research subject, indicating that they have the ability to carry out scientific research, teaching, and independently conduct high level technical work;
- 4) Be able to use a foreign language in reading literature in their field and write paper abstracts in that language.
- 5) Attain the research performance requirements set by the degree standards of the University.

➔ Conditions for Doctoral Degree Awarding:

PhD Degree recipients must:

- 1) Master the basic theory of Marxism.
- 2) Acquire a solid and extensive foundational theory of their discipline and systematic and in-depth knowledge of their field;
- 3) Be able to carry out scientific research independently;
- 4) Make creative achievements in scientific research and modern technology;
- 5) Be able to read literature and write general articles in their field in their first foreign language; if the first foreign language is not English, they must learn English as their second foreign language and have the ability to read English literature in their respective field.
- 6) Attain the research performance requirements by the degree application standards of the University.

Master's and PhD degrees will not be awarded to candidates if they

- 1) Fail to pass their thesis/dissertation defense.
- 2) Display unethical academic behavior such as plagiarism and falsification in their dissertation.

Point of Contact:

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X Annual Review of Scholarship

Annual Review of Scholarship

➞ Review Objectives

The objectives of the annual review are for student recipients of the full or partial scholarships from the Chinese Government (referred to as "scholarship students", which include undergraduates, Master's degree candidates, PhD candidates, and non-degree students for continuing studies at general and advanced levels). Scholarship students subject to the annual review include:

- 1) Scholarship students who studying for more than one year at the university are subject to scholarship review once every year.
- 2) Scholarship students who are about to complete their current studies but wish to further their studies with the support of the scholarships must participate in the annual review the year in which their current studies are about to be completed.
- 3) Scholarship students who have resumed their studies with the approval from the university after a leave of absence will subject to the annual review, with their overall performance assessed before their leave of absence and upon return. The duration of their leave will not be included in the time frame of their studies.

➞ Annual Review Criteria

- 1) Course achievements: First semester grades of an academic year, general performance of the second semester (i.e. mid-term exams or quizzes).
- 2) Academic Conduct: Observation of academic rules on class attendance, study diligence, fair grades and comments from course instructors or advisors.
- 3) General Behavior: Obedience to China's laws, observation of university rules and regulations, respect for teachers and staff members, participation in university activities, care of university property, etc.
- 4) Awards and penalties received during the university schooling.

➞ Annual Review Procedures

- 1) Time: April 20th to May 10th each year.
- 2) The International College will be in charge of explaining and issuing the Annual Review Form to the government scholarship students.
- 3) Students who apply for the scholarship for the following academic year must fill out the first page of the form and submit it to the International College.
- 4) The annual review of scholarship students completing additional studies in various colleges/departments and for students of degree programs will be based on the transcripts issued by their colleges/departments along with their teachers' comments and other aspects of their overall performance. The review results will be signed by their department chairman and then be submitted to the International College.
- 5) The annual review of government scholarship students who are in the process of writing their degree thesis will be based on the comments on the students' overall performance during the applicable semester provided by the students' advisors. The advisors' comments need to be signed off by the department chairman and then submitted to the International College.
- 6) The International College will fill out the second page of the review form by integrating the comments of the students' departments and advisors/professors in accordance with the requirements of the Ministry of Education. The review forms will be officially sealed and signed by the head of the International College and then submitted to the China Scholarships Council before May 31 each year.
- 7) The China Scholarships Council will notify Zhejiang University of the review results before June 30 of each year, and the university will then notify the scholarship students. If necessary, the embassies of the students' home countries in China or the institutions for exchange students will be notified.

➞ Annual Review Procedures

The results of the Annual Review will be either a "Pass" or "Fail". Students who receive a "Fail" will have their scholarship eligibility revoked and put on scholarship probation at the beginning of the following academic year. The probation period lasts one academic year.

Students with on scholarship probation can submit written applications to the Continuing Studies department. If their applications are approved, they can continue their studies for the following academic year by paying full or reduced tuition fees.

Students on scholarship probation but have been permitted to continue their studies at Zhejiang University can apply for restoring their eligibility when their probation period is over. The applicants must submit written applications to Zhejiang University. Upon the university's approval, the applications will then be submitted to China Scholarships Council for authorization.

Students who have withdrawn from Zhejiang University after having their scholarships revoked are not eligible to restore their scholarships.

② Conditions that prevent passing of the Annual Review

- 1) Master's degree candidates who fail in two degree courses, or fail in one degree course in a single semester even after a makeup exam.
- 2) PhD candidates who fail in one degree course.
- 3) Graduate students deemed unfit for further studies or show obvious lack of research ability during dissertation writing.
- 4) Students who violate examination regulations.
- 5) Students who have received one "demerit" or above or two "Written Warnings" as disciplinary actions from the university due to various offences.
- 6) Students who cannot continue study due to physical or mental diseases.
- 7) Students who are to be dismissed due to various offences. Students who do not participate in the Annual Review without valid reasons shall have their eligibility for the scholarships canceled.



<http://iczu.zju.edu.cn/attachments/2015-12/01-1450305168-7326.pdf>

This is part of Zhejiang University's Implementing Measures for Chinese Government Scholarship Annual Review for International Students. For the entirety of the document, please scan the above two-dimensional barcode.

Statement:

- 1) The official version of this handbook is in Chinese, with a English translation available for convenience purposes only. In the case of any discrepancy between the English translation and the original Chinese version, the Chinese version holds precedence.
- 2) Zhejiang University College of Civil Engineering and Architecture reserves the right for the final interpretation of this handbook.
- 3) This handbook was finalized on November 30, 2016. Any new laws and regulations disseminated by government departments or the university after this date will hold precedence over any information stated in this handbook.



Appendices



Collection of Documents for the Graduate
School of Zhejiang University



Zhejiang University's Rules for Degree
Thesis/Disseration Writing



Zhejiang University's Academic Rules for
Engineering Graduate Students



Online Course Instructions for Graduate Students



Obligatory Social Practice Zhejiang
University's Management Methods for PhD
Candidates



Zhejiang University's College of Civil
Engineering and Architecture Management
Methods for Graduate Students in Financial
Difficulty



Graduate Student Work Collection of the
College of Civil Engineering and
Architecture



For the latest information, scan the the QR code
for the graduate student education public
account of Zhejiang University College of Civil
Engineering and Architecture

Mandatory Course List



Discipline	Course Name	Nature of Course	Course Type	Brief Introduction to Course Content
Geotechnical Engineering	Advanced Soil Mechanics (II)	Specialized degree course	Doctoral degree course	This course is an introduction to the history of soil mechanics, its new developments and trends, characteristics, and research methods. It also introduces the formation and structure of soil, new developments in basic theories of soil mechanics, including those in soil consolidation theory, soil penetration theory, soil shearing strength theory, and theory of soil deformation. Main teaching material: Gong, Xiaonan. <i>Advanced Soil Mechanics</i> . Hangzhou: Zhejiang University Press, 1996.
	Advanced Basic Engineering Science	Specialized degree course	Master's degree course	Based on the discussions of the basic features of soil, groundwork sedimentation and other basic concepts, this course makes an introduction to the analytical method and monitoring in regard to foundation pit excavation and slope stability; the pile form in pile foundation engineering and construction process, horizontal bearing capacity, analysis of the combined effect of the piled raft, pile sedimentation, pile foundation testing, pile drivability, and the like; design, construction, and monitoring of composite foundation such as the cement

				mixing pile in groundwork, design ideas such as the drainage consolidation method, etc.
	Advanced Soil Mechanics	Specialized degree course	Master's degree course	
Structural Engineering	Concrete Fracture Mechanics	Specialized degree course	Doctoral degree course	This course first introduces the basics of linear elastic fracture mechanics and elastic-plastic mechanics, the softening relational curve describing zone softening performance, several fracture models and methods for calculating the corresponding fracture parameters as proposed by some foreign scholars; second, it fully presents the concrete double-K fracture model, double-G model, KR resistance curve based on fracture cohesion and with stress intensity factors as the parametric characterization, and methods for fracture stability analysis; finally, it introduces several fracture parameter measurement methods as recommended by RILEM, concrete II fracture theory and its application.
				This course aims to present various traditional and basic theories on bar

	Nonlinear Analysis of Structures and Stability Analysis	Specialized degree course	Doctoral degree course	instability and calculating methods, discusses in detail the geometrical nonlinearity of the bar system, and introduces the basic concepts of generalized inverse, where the Moore-Penrose generalized inverse linear equation set is used to auto-trace the whole process of structural deformation and instability. Main teaching material: Guan, Fuling. <i>Application of Generalized Inverse in Engineering</i> (to be published). Main references: 1. Wang, Shitong. <i>Structural Stability</i> . South China University of Science and Technology, 1997.
	Structural Wind Engineering	Specialized degree course	Doctoral degree course	This course mainly includes: the forming of winds and their categorization; characteristics of the atmospheric boundary layer and wind turbulence; wind vibration response and static equivalent wind loads; wind-resistant design for high-rise buildings; wind-resistant design for low buildings; wind loads for large-span roof structures; wind vibration response at high towers; analysis of wind vibration response at large-span bridges; wind tunnel and wind tunnel experimenting techniques; rain-wind induced vibration at cables of cable-stayed bridges and control; computer simulations of wind

				pressure on the building surface and the surrounding wind field; etc.
	Advanced Anti-Seismic Engineering	Specialized degree course	Master's degree course	<p>This course discusses the following contents:</p> <ol style="list-style-type: none"> 1. Principles for anti-seismic design for building structures, conceptual design, and computational design; 2. Seismic response analysis methods for building structures; 3. Structural behaviors of components such as the beam, pillar, node, and shear wall in the case of a major earthquake; 4. Anti-seismic ability of a structure in the case of a major earthquake, its evaluation, and structural elastic-plastic analysis methods; 5. Calculating methods and essentials for the design of an isolation structure; 6. Principle for energy dissipation and anti-seismic performance analysis of an energy dissipation structure; 7. Anti-seismic verification of a structure and reinforcement; 8. The application of FRP (fiber reinforced plastics) in anti-seismic reinforcement.
	Engineering Load Analysis	Specialized degree course	Doctoral degree course	
	Wire Frame and Latticed Shell Structures	Specialized degree course	Master's degree course	The wire frame and latticed shell structures are collectively called the space lattice structure, which is the most popular spatial structure in recent years at home and abroad.

				<p>This course aims to discuss the structural form, basic theory, and calculating methods for this structure. Main teaching materials: 1. Dong, Shilin and Qian, Ruojun. <i>Analytical Theory and Calculating Methods for Space Lattice Structure</i>. Beijing: China Architecture & Building Press, 2000; 2. Shen, Zuyan and Chen, Yangji. <i>Wire Frame and Latticed Shell</i>. Shanghai: Tongji University Press, 1997.</p>
	Theory of Structural Reliability and Its Application	Specialized degree course	Master's degree course	
	Advanced Reinforced Concrete Structure	Specialized degree course	Master's degree course	
	Advanced Concrete Science	Specialized degree course	Master's degree course	<p>Course abstract: rheological characteristics of newly mixed concrete; non-load deformation of hardened concrete and countermeasures; deformation of concrete under load and crack control; concrete and durability of concrete structures; studies of concrete and reinforced concrete structures and relations. It requires the students to command the rheology of concrete, principles for parameter design and adjustment and applied technology and, after</p>

				<p>grasping the principles for the durability of concrete and concrete structures, study the reliability of reinforced concrete structures through concrete and reinforcement material measures.</p>
	Advanced Dynamics of Structures	Specialized degree course	Master's degree course	<p>This course is mainly an introduction to: basic principles for building structural vibration equations, such as the principle of virtual work, Hamilton's principle, and Lagrange's equation; basic concepts for dynamic characteristics such as structural vibration mode and natural frequency; methods for calculating structural vibration response, such as mode superposition and direct integration; numerical methods for structural vibration analysis, such as the finite element method and the substructure technique; basic concepts of structural nonlinear vibration and random vibration; a selection of practical applications in the scenarios of actual engineering or everyday life.</p>
	Basics of Theory of Structural Stability	Specialized degree course	Master's degree course	<p>Basics of Theory of Structural Stability is one of the major foundational courses in</p>

				structural engineering. Main teaching materials: 1: Tong Genshu . <i>Basics of Theory of Structural Stability</i> (self-made teaching material). 2: Chen, Ji. <i>Stability of Steel Structures, Theory and Design</i> . Main references: those relevant to the computation of structural stability.
	Computational Structural Mechanics	Specialized degree course	Master's degree course	This course discusses the common methods for structural computer analysis (numerical analysis): the basic concepts and theories of the finite element method, weighted residual method, and boundary element method and their applications. Main teaching material: Tang, Jinchun, Sun, Bingnan, and Guo, Dingkan. <i>Computational Structural Mechanics</i> . Zhejiang University Press, 1989.
Municipal Engineering	New Technology for In-depth Treatment of Water Supply	Specialized degree course	Doctoral degree course	Its contents mainly include: introduction to the status quo of water source pollution and development of the standards for drinking water, basic concepts and theories of biological and chemical pretreatment technology, enhanced conventional treatment technology, ozone-biologically activated carbon technology, membrane treatment, and

				advanced oxidation technology and their applications in engineering.
	Environmental Fluid Mechanics	Specialized degree course	Doctoral degree course	This course aims to explore the transmission and composition (or decomposition) of pollutants and nutrients in natural rivers, artificial water systems, and the atmosphere. It mainly includes: methods of control over the pollutants in water systems and its transmission and mixing; diffusion (molecular diffusion); turbulent diffusion and dispersion of shear flow; mixing in rivers vertically and horizontally; turbulent jet and turbulent plume; physical process in rivers and reservoirs; the layered flow theme; other themes.
	Introduction to Intelligent Algorithms	Specialized degree course	Master's degree course	
	Advanced Engineering Fluid Mechanics	Specialized degree course	Master's degree course	This course explores, on the basis of the undergraduate-level fluid mechanics, the theoretical knowledge of fluid mechanics such as basic equations for fluid mechanics, turbulence theory, and boundary layer theory. Additionally it discusses the theory and methods for using the above theoretical knowledge of fluid mechanics to address engineering issues closely and professionally relevant to municipal engineering and so on.

	Management and Use of Rain-water	Specialized degree course	Master's degree course	This course provides a general introduction to the water-rain management thinking and methods in foreign urban development from management perspectives such as low-impact development, the sustainable drainage system, and optimal water management measures.
Disaster Prevention and Mitigation Engineering and Preventive Engineering	Principle of Disaster Prevention Engineering	Specialized degree course	Doctoral degree course	Based on the characteristics of different types of engineering constructions, this course discusses the relationship between engineering constructions and the environmental conditions, methods for engineering safety verification and detection, analysis and appraisal of an engineering disaster, decision-making on disaster prevention, and methods for management design.
	Introduction to Disaster Prevention Engineering	Specialized degree course	Master's degree course	This course mainly includes the overall development of disaster engineering science, earthquake and prevention, fire and building fire control, urban flood prevention, wind disaster and prevention and control, explosion and lightning and prevention and control. It systematically discusses the basic principles and main research

				achievements in these areas and their actual applications.
	Geological Disasters in Engineering	Specialized degree course	Master's degree course	<p>This course discusses the principle for investigating and analyzing geological disasters relevant to engineering projects, disaster prevention and mitigation measures, and management methods, etc.</p> <p>Main teaching material: self-made teaching material; main references: Kong, Xianli and Shi, Zhenming. <i>Engineering Geology</i>. China Architecture & Building Press, 1994; Zhang, Zhuoyuan, Wang, Shitian, and Wang, Lansheng. <i>Principle for Engineering Geological Analysis</i>. Geology Publishing House, 1993.</p>
Bridge and Tunnel Engineering Project Management	Vibration and Stability of a Bridge	Specialized degree course	Doctoral degree course	<p>The first part of this course introduces a dynamic analysis of the bridge structure, mainly including the analysis of natural vibration and forced vibration of a bridge, and natural vibration and torsional vibration of an arch bridge, the natural vibration and forced vibration of a large-span bridge, interactive vibration of an axle and analytical model. The last part introduces the stability analysis of a bridge structure, mainly including the bending stability of the central pressure bar and beam-column, the</p>

				flexural-torsional buckling of thin-walled components, the bending of the frame or truss, internal and external instability of the arch bridge surface, and the warping of plates.
	Large-span Cable Bridge	Specialized degree course	Doctoral degree course	This course introduces the development and status quo of large-span cable bridges, primarily including the master design of large-span cable bridges such as the cable-stayed bridge, suspension bridges, and combinational system, key points in main structure designs, computational theory and its application, experimenting and research methods, construction characteristics and methods of large-span cable bridges, and special cable-stayed bridges; orthotropic steel bridge deck and principle and method for calculating and analyzing its anti-fatigue performance. In combination with practice, it helps expand the horizon of the students.
	Advanced Theory for Bridge Design	Specialized degree course	Master's degree course	This course introduces the stress characteristics of a large-span pre-stress concrete bridge structure

				with a focus on the shear lag, distortion, and reversion of the box girder in combination with cases of bridge calculations at home and abroad in order for the students to master the theory for the design of a complex bridge and its application. Main teaching material: Xiang, Haifan. <i>Advanced Theory of Bridge Structures</i> . China Communications Press, 1991. Du, Guohua et al. <i>Structural Analysis of Bridges</i> . Tongji University Press, 1997.
	Finite Element Method for Structural Analysis	Specialized degree course	Master's degree course	This course deals with the principle of the finite element method for linear elastic structures and the programming method. Upon completion of this course, the students will master the basic principle of the finite element method for linear elastic structures in solid mechanics and its application and be able to write computer programming.
	Experiment and Testing Techniques for Bridge and Tunnel Engineering	Specialized degree course	Master's degree course	This course systematically introduces the purpose, category, principle, and method of structural experiment for bridge and tunnel engineering, its

				application, and non-destructive testing techniques. It specifically includes: instruments and apparatuses for bridge and tunnel structural experiment, principle, method, and application of such experiment; bridge structural static load testing, vibration testing, model testing, and typical cases of bridge structural static load testing. It also includes the contents of and methods for tunnel engineering experiment and testing and the principle for the geological radar.
	International Engineering Project Management	Specialized degree course	Master's degree course	This course discusses the management of outsourced engineering projects and project management under the FIDIC conditions. Main materials: Yang, Jianji. <i>International Engineering Project Management</i> . China Water & Power Press. 1999
	Management Science for Construction Enterprises	Specialized degree course	Master's degree course	This course covers: general concepts of construction enterprise management; business management of construction enterprises; bidding for construction projects; plan

				management, organizational management, technology management, quality management, information management, material and equipment management, and cost and financial management. Upon completion of this course, the students are required to systematically master the basic theory and methods for construction enterprise management, have an understanding of the latest development of this discipline at home and abroad, and improve their ability to solve actual problems. Main teaching material: Ruan, Lianfa. <i>Management Science for Construction Enterprises</i> . Zhejiang University Press.
	Management Statistics	Specialized degree course	Master's degree course	This course covers: basics of theory of probability, data collection and processing, variance analysis, relevance analysis, linear regression analysis, principal component analysis and factor analysis, cluster analysis and discriminant analysis, and the application of SPSS statistics

				software. Upon completion of this course, the students are required to master the basic principle for management statistics and be able to quantitatively analyze managerial problems by statistical methods and through statistics software.
	Construction Economics	Specialized degree course	Master's degree course	In combination with the construction industry in China, its reform, development, and history of the construction market, this course examines the objective economic patterns of the operation and development of the construction industry by integrating modern economics. It includes: characteristics and structure of the construction industry and its position in the national economy as well as its development trends; the characteristics, supply and demand, and balance of the construction market, costs and revenues of construction enterprises, etc.; technological innovation in the construction industry and

				institutional analysis of the construction market; reasonable allocation of factors of production in the construction industry, productivity, production function, its role, etc.
	Operations Research	Specialized degree course	Master's degree course	As an effective tool to modernize management, operations research is widely applied in production management, engineering technology, scientific experimentation, finance and economics, and social sciences. This course requires the students, on the basis of the undergraduate Operations Research, to further grasp the basic theory and methods for operations research. Main teaching material: Gan, Yingshou et al. <i>Operations Research</i> . Tsinghua University Press (2 nd edition), January 1990. Main references: <i>Linear Planning and Network Optimization</i> . Zhejiang University Press. Yao, Enyu. <i>Operations Research: Linear Planning</i> . He, Yong. <i>Operations Research: Combinatorial</i>

				<i>Optimization.</i>
Road and Transportation Engineering	Constitutive Theory for Engineering Materials	Specialized degree course	Doctoral degree course	Based on theory and calculations of continuum mechanics, constitutive equations are one of the fundamental conditions for a solution. Different from continuums such as metal materials, the materials involved in civil engineering are all non-continuums. The classical elastic-plastic theory based on metal materials and constitutive relations have to take into account the characteristics of civil engineering materials, especially the obvious elastic-plastic features. This course, taking constitutive characteristics of engineering materials for example, systematically introduces the elasticity theory and plasticity theory of materials and their viscous rheological characteristics.
	Road Theories and Methods	Specialized degree course	Doctoral degree course	This course discusses theories and methods relating to the construction and maintenance of high-grade roads and experimenting and research technology, helping the students to master the methods for studying the

				structural characteristics and mechanical mechanism of road engineering in a complicated environment and under traffic loads and to understand new road technology and approaches to research.
	Traffic Modeling Methods	Specialized degree course	Doctoral degree course	This course mainly discusses the core content of traffic modeling, primarily including: the car-following model; 2) the traffic wave model; 3) the continuous flow model; 4) gap theory (on the minimum gap acceptable to the driver in the minor traffic flow at an unsignalized intersection).
	Traffic Big Data Analysis	Specialized degree course	Master's degree course	Part one of this course introduces case studies of current traffic big data, typical systems, and data sets including PeMS, NGSIM, TIMS, taxi, mobile phone data, microwave, accident data sets, etc. Part two elaborates the theories and methods for traffic big data analysis, including traffic big data categorization theory, regression theory, regularization theory, and unsupervised learning. Part three introduces typical fields for

				the application of urban traffic big data, including the temporal and spatial dynamic distribution of geographic information points, characteristics of resident trips under the big data background, analysis and judgment of traffic jam characteristics through multi-source heterogeneous data, traffic accident analysis based on the evolution of trip requirements of individuals and groups and on big data, etc.
	Methods for Transportation Network Analysis	Specialized degree course	Doctoral degree course	
	Intelligent Algorithm for Traffic Optimization	Specialized degree course	Doctoral degree course	
	Timing Theory and Methods for Road Traffic Signals	Specialized degree course	Doctoral degree course	The timing theory and methods for road traffic signals are the core in traffic control. This course <u>covers</u> : 1) overview of signal timing; 2) theory of signal timing at a single intersection; 3) coordinated and controlled timing on a main route; 4) coordinated and controlled timing methods for regional traffic; 5) controlled timing methods for ramps

				on expressways.
	Expressway Traffic Monitoring and Control	Specialized degree course	Master's degree course	This course consists of two parts: Part I: traffic monitoring, mainly involving traffic detection and data processing, real-time traffic estimation and prediction, automatic accident monitoring, and real-time estimation, with a focus on the spatial representation of the state in the traffic model and the Kalman filter. Part II: various control methods involved in traffic control such as entry ramps, speed limit, tide control, and route control. The course will be supported by practical cases.
	Theory of Pavement Structure and Design	Specialized degree course	Master's degree course	This course discusses the main theory and methods for the pavement structure and design: analysis of the elastic half space; mechanical analysis of the plate on Winkler's elastic foundation; mechanical analysis of the viscoelastic layered system, and limit standard and strength theory for pavement design; theory of elastic layer subjected to

				horizontal force and other key problems. Teaching material: Zhu, Zhaohong, Wang, Binggang, and Guo, Dazhi. <i>Pavement Mechanics and Calculations</i> . China Communications Press, 1985.
	Mesoscopic/Microscopic Mechanics and Its Application	Specialized degree course	Master's degree course	This course discusses the mechanical behaviors of solids and particles from the mesoscopic perspective. After an introduction to the basic theories of tensor analysis and continuums and basic concepts of elastic mechanics, it presents the basic theory of microscopic mechanics and the numerical analysis method for composite materials on the basis of Eshelby's equivalent inclusion theory for the valid performance of composite materials, mainly including self-consistent theory, differentiation, and Mori-Tanaka method; basic mechanical system of granular materials, including the main characteristics and static equilibrium system of such materials, their mesoscopic characteristics and quantitative description.

	Integrated Transportation Planning	Specialized degree course	Master's degree course	The students in this discipline are mainly required to study the basic theories and knowledge of the transportation system, transportation engineering, system engineering, etc., to receive basic training in reading and drawing schematics, hands-on operations, engineering survey, engineering budget, and so forth. The main goal of this course is to teach the basic ability to carry out work in such fields as transportation planning, design, safety, and management and control.
	New Asphalt Pavement Material and Its Performance	Specialized degree course	Master's degree course	<p>1. The course introduces the basic concepts of asphalt as a pavement material and its physical, chemical, and mechanical properties.</p> <p>2. It systematically discusses the basic concept of the mixed asphalt pavement material and its application in engineering.</p>
	Nonlinear Finite Element Theory and Process	Specialized degree course	Doctoral degree course	This course tackles the basic theory of the nonlinear finite element method, thinking for nonlinear finite element process design, and technology used in the analytics

				software. Main teaching materials: Xu, Xing. <i>Nonlinear Finite Element and Process Design</i> . Zhejiang University Press, 1991; Ling, Daosheng, <i>Nonlinear Finite Element and Process</i> (electronic teaching material), 2003.
	Variational Principle in Elastic Mechanics and Finite Element Method	Specialized degree course	Doctoral degree course	
	Elastic-Plastic Mechanics for Engineering	Specialized degree course	Master's degree course	Main teaching material: Sun, Bingnan, Hong, Tao, and Yang, Lixian. <i>Elastic-Plastic Mechanics for Engineering</i> . Zhejiang University Press, 1999.
	Engineering Experiment & Test Techniques	Specialized degree course	Master's degree course	
	Principle and Methods for Optimization	Specialized degree course	Master's degree course	This course includes: description and categorization of optimization problems, optimal conditions for such problems, duality theory, basic concepts of linear planning, simplex method and revised simplex method, and solution to the unconstrained optimization problem; descent iterative algorithm, convergence rate and stop criteria, one-dimensional

				search, steepest descent method, Newton's method, conjugate direction method, variable-metric method, and constrained nonlinear optimization method; sequential linear programming, penalty function method, multiplier method, dynamic programming, multi-objective programming, discrete variable optimization and genetic algorithm, and cases of engineering application.
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