

Educational Plan for Professional Master Degree Program in Water Conservancy Engineering
(CODE: 085214)

I . Introduction of Professional Degree Categories (Fields)

Water conservancy engineering is a pillar of national infrastructure and basic industries. Based on the deep investigation on the temporal and spatial distribution and evolution of the water, through the implementation of engineering and non-engineering measurements to achieve the adequate protection and rational use of the water resources, besides promote the harmonious between man and nature to ensure sustainable and healthy development of society.

The discipline of water conservancy engineering in Guangxi University (GXU) was founded in 1932, being one of the earliest established engineering disciplines in GXU. Many large-scale projects were launched associating with civil engineering, GXU, including "Structural Engineering and water resources development in Red River Basin", "211 Project" National Key Disciplines, the Key Laboratory of Engineering Disaster Prevention & Structural Safety of Ministry of Education, the Key Laboratory of Disaster Prevention and Mitigation & Engineering Safety of Guangxi autonomous region," Guangxi Talent Highland ".

Other high level disciplines platforms. The discipline of water conservancy engineering has developed an academic team with strong theoretical foundation and the rich practical experience. It has distinctive characteristics and advantages in the four research interests (The Dam Structure Design Theory & Safety Evaluation, Hydropower Station Pressure Pipelines & Plant Structure Safety, Subtropical Water Resources Development, and Utilization, River Dynamics and Water Disasters Prevention and Control).

Research Direction:

- (1) Hydro Construction Engineering
- (2) Conservancy and Hydropower Engineering
- (3) Hydrology & Water Resources
- (4) Hydraulics & River Dynamics

II. Educational Objectives

Full-time Master degree is a professional degree close to the actual engineering technology, and the students are mainly undergraduate students in this field. The teaching content of water conservancy engineering focuses on the application in engineering, the main objective of this discipline is to train professional engineers and managers who have the integrative competence of practical ability, professional learning outcomes, and research application ability. The eligibility criteria of this program are:

- (1) Support the leadership of the Communist Party of China and the socialist system, love the motherland, abide by the law, with a strong sense of dedication and dedication, and actively serve the socialist modernization.
- (2) Have a firm basic theories and comprehensive professional knowledge; grasp the methods of how to solve practical problems by planning, design, calculation and testing; have a certain capability to solve practical problems; be able to undertake professional technical or management work, with good professionalism of the high-level application of specialized personnel.
- (3) Show good conditions of physical and psychological health
- (4) Be proficient in a foreign language

III. Length of Schooling and Duration

Duration: 2.5 years. Study period of 2 - 5 years

IV. Training and Academic Credits requirements

Total Academic Credits must be 32 credits at least, including 11 credits of degree courses in which 5 credits for Public Courses and 6 credits for specialized courses; Non-degree Courses are not less than 9 credits; 8 credits for the professional practice; 2 credits for academic events; 1 credit for topic selection and thesis proposal.

1. Courses and Credit Allocation

| Courses Classified | Course Code | Course Name | Hours | Academic Credits | Term | Remarks |
|--------------------|-------------|----------------------------|-------|------------------|------|---------|
| Public Courses | 1 | Comprehensive Chinese | 54 | 3 | 1 | |
| | 2 | General Situation of China | 36 | 2 | 1 | |

| Courses Classified | | Course Code | Course Name | Hours | Academic Credits | Term | Remarks |
|---------------------|----|--|-------------|-------|------------------|------------------|---------|
| Specialized courses | 3 | Numerical Analysis | 40 | 2 | 1 | Choose 3 courses | |
| | 4 | Mathematical and Physical Equation | 40 | 2 | 1 | | |
| | 5 | Engineering Elasticity Mechanics | 40 | 2 | 1 | | |
| | 6 | Finite Element Method and Software Application | 40 | 2 | 2 | | |
| | 7 | Theory of Runoff Generation and Concentration | 54 | 3 | 1 | | |
| | 8 | Water Resources Systems Engineering | 54 | 3 | 1 | | |
| | 9 | Engineering Hydromechanics | 54 | 3 | 1 | | |
| Non-degree Courses | 10 | Plasticity Mechanics in Engineering | 40 | 2 | 2 | | |
| | 11 | Fracture-Damage Mechanics in Engineering | 40 | 2 | 2 | | |
| | 12 | Rock Mechanics and Engineering | 40 | 2 | 2 | | |
| | 13 | Program Design | 40 | 2 | 2 | | |
| | 14 | Hydrologic Stochastic Processes | 40 | 2 | 2 | | |
| | 15 | Hydrologic Analysis and Engineering | 40 | 2 | 2 | | |
| | 16 | Fluvial Morphology | 40 | 2 | 2 | | |
| | 17 | Design Theory for Hydraulic Structure | 40 | 2 | 2 | | |
| | 18 | Optimal Designs in Structure Engineering | 40 | 2 | 2 | | |
| | 19 | Structural Reliability in Engineering | 40 | 2 | 2 | | |
| | 20 | Resistance Disaster Technology for Hydraulic Structures | 40 | 2 | 2 | | |
| Non-degree Courses | 21 | Artificial Intelligence Technology and Its Engineering Application | 40 | 2 | 2 | | |
| | 22 | Theory of Dam Safety Evaluate | 40 | 2 | 1 | | |
| | 23 | Ultimate Bearing Capacity Analysis of Engineering Structures | 40 | 2 | 2 | | |

| Courses Classified | Course Code | Course Name | Hours | Academic Credits | Term | Remarks |
|-----------------------|-------------|--|-------|------------------|------|---|
| | 24 | Hydraulic Steel Reinforced Concrete | 40 | 2 | 2 | |
| | 25 | Dam Construction Technology and Engineering Practice | 40 | 2 | 1 | |
| | 26 | Penstocks in Hydropower Station | 40 | 2 | 2 | |
| | 27 | Computer Simulation Technology in Geotechnical Engineering | 40 | 2 | 2 | |
| | 28 | Utilization and Management of Water Resources | 40 | 2 | 2 | |
| | 29 | Reservoir Optimal Operation Technology | 40 | 2 | 2 | |
| | 30 | Ecological Hydraulics | 40 | 2 | 2 | |
| | 31 | Modern Hydrological Model | 40 | 2 | 2 | |
| | 32 | Evaluation of Water Resources Carrying Capacity | 40 | 2 | 1 | |
| | 33 | Fluvial Numerical Simulation Technology | 40 | 2 | 2 | |
| Supplementary courses | 1 | Hydro Building | 40 | No credit | 2 | The student who are equivalent education and cross-professional admitted to the master's degree should be completed 2 undergraduate courses |
| | 2 | Hydraulics | 40 | | 2 | |
| | 3 | Engineering Hydrology | 40 | | 2 | |
| | 4 | Mechanics of Materials | 40 | | 2 | |

Note: The degree courses scores that applying for a degree are not less than 70 points, non-degree courses scores are not less than 60 points. The supplementary course must pass the exam and achieve the result for passing.

2. The professional practice (8 credits)

The professional practice is an important part of training the full-time professional graduate students. It can be taken a way of combination of centralized practice and segmented practice. During the graduate period, all students must ensure that the period of practice is not less than half year. For the students just

under-graduated should participate in the practice internship over a year. However, the students could participate in the practice continuously or intermittently.

The content, organization and arrangement of the professional practice should be agreed by the two supervisors: one is within the university while another is a external supervisor. Then the Professional Practice Plan is reported to postgraduate office and kept in archives.

The Professional practice plan should meet the professional training objectives, so that every postgraduate student takes a certain technical responsibilities and tasks in the engineering practice. Besides, The professional practice plan should include the content of engineering safety and personal safety education.

In the middle of professional practice, postgraduates should write a formal report on the implementation of the professional practice plan, including the problems and difficulties during practicing. Two professors should review the report collectively, and give the solutions for the problems.

At the end of professional practice, the postgraduates are required to submit a summary report, which is signed by the supervisor. The summary report should include the following items: the process of professional practice; the practice experience; the preparation for the practice, arrangement, and the problems in the dissertations after professional practice. The reports are mainly assessed by external supervisor, associated with internal supervisor as well as staffs from professional area, and then they write conclusions regarding the work performance, responsibility, work mark, and operational capacity, etc. Finally, it is reported to postgraduate office and keeps in archives.

3. Compulsory courses

1) Academic events (2 credits)

Every student should attend lectures more than five times, including disciplines lectures, academic seminars and enterprise experts' lectures, and then the students should write interim report. It is no credit if the students absent more than 5 times.

2) Topic selection and thesis proposal (1 credit)

(1) The essay topic should be selected based on the practical engineering or production, with specific production background and application value. The selection needs to meet the training aims, in conjunction with professional practice. Moreover, the topic should possess some extent of technical difficulties, advances, and workload. The topic can be a completed project design or technology improvement project. It also can be a research project. It also can be a new technology, new equipment, new material, and study and development of a new product. It can be a summary on an important project's construction. The format of a dissertation could be engineering design, summary on an important project construction, research report or paper on new product, technology, or process.

(2) With the instruction of supervisors, before the end of the third semester, the postgraduate students should confirm the research direction of dissertation, carries on the mid-term examination, and the public report. The public report should include literature review of the topic selected. The public report is organized by each professional inspection team, which will give a conclusion whether the student is qualified. During the conference, supervisors have the responsibility to assist students to evaluate the possibility of their innovation ideas, the value of application, and the probability of the achievement of the essays within scheduled period.

(3) Postgraduates should submit their progress report of the thesis before the end of the fourth semester. At the same time, the students should submit the necessary materials regarding the progress report. It contains:

i. The extent of agreement between thesis progress and the research schedule. Such as: basically agree, almost agree, there is a delay about a month, a big delay, etc.

ii. The depth of the thesis. Such as: analytical study part has been finished. The critical issues of the experimental program have been overcome. It has not yet touched on the key issues of thesis, etc.

iii. What the trouble in the present thesis preparing and whether have any solutions or measurements?

Each professional inspection team examines the thesis progress, the existing troubles, and the gap of schedule. Help to solve the problems encountered by the students' thesis preparation. The thesis progress report after reviewed by the supervisor will be submitted to the postgraduate office and keep in archive. The graduate student office will give warning to the students who has poor comprehensive abilities, slow thesis progress, lack of investment of time and effort.

V. Thesis

1. The professional degree postgraduate education implements external and internal double mentor system. Internal mentor takes the responsibility of guiding the professional degree student. One specific internal mentor should be appointed and in charge of the whole process. The external mentor cannot recruit the postgraduate students alone. They only can be a second mentor or be a member in the mentor group to participate in the instruction process.
2. The thesis possesses certain technical standards and workload to reflect the ability of the authors to overcome the construction problem by using the scientific theory, method, and technology means comprehensively. And it should have a certain theoretical basis and it is advanced and useful.
3. The thesis must be accomplished independently under the guidance of the supervisor. Professional degree graduate students must achieve all credits which they are supposed to get in the stipulated period. It is possible for them to apply for the final oral examination when they had passed the mid-term examination.

VI. Review

1. Thesis should be reviewed according to the following criteria: the ability of the author to solve the engineering problem by using the scientific theory, method, and technical means; the technical difficulties and the workload involved in the thesis; the new ideas, methods, and progress in solving engineering problems; the

advance and practicality associated with the new technology and new design that are proposed in the thesis; the economic and social benefits, etc.

2. The "double-blind" review system: The defense committee shall consist of 3-5 experts related to this field. The mentors of the degree applicant should not be members of the committee.