National Taiwan University of Science and Technology,

Department of Computer Science and Information Engineering

Doctoral Degree Guidelines

I. Within two years after admission (excluding the period of suspension of schooling), a doctoral student must take and pass a two-stage qualification examination for basic competency assessment and professional competency assessment. Only after the student has passed the examination, the student obtains the qualification of doctoral candidate and is able to continue to pursue the doctoral degree. If the student fails the basic competency assessment or professional competency assessment within the prescribed period, the student must withdraw from school.

II. Basic competency assessment:

1. Basic competencies include four fields as follows:

    (1) Artificial intelligence;

    (2) Multimedia;

    (3) Computer networking and communication; and

    (4) Embedded systems and information security.

    A doctoral student is required to pass the assessment in at least two of the above-mentioned fields.

2. To pass the basic competency assessment on a specific field, the student shall submit the application based on the results of the courses the student has completed (not limited to the courses the student has completed after being admitted to the doctoral program). The contents of the applied courses should be similar to those of the courses offered by the System of National Taiwan University (courses offered by the College of Electrical Engineering & Computer Science of NTUST, the College of Electrical Engineering & Computer Science of National Taiwan University, and the College of Science, Technology and Engineering of National Taiwan Normal University). The list of courses included in each field can be found in the supplement below. The contents covered by each course should be subject to the syllabus of the

course of the department. One course can only be used for at most one field in the basic competency assessment.

3. One or more fields in the basic competencies can be recognised by published academic papers. The requirements for paper publication are as follows:

   (1) In the published paper, the doctoral student must be the first author despite of the supervising professor.

   (2) The submitting date of the paper must be later than the enrollment date of the student for the doctoral program.

   (3) The paper shall not be counted in passing the threshold of graduation paper publication.

   (4) The paper must be published in one of journals in Q1, IEEE, ACM or other equivalent grades. The grades of journals are determined by the Academic and Faculty Affairs Committee.

4. Procedure of basic subject competency assessment application is as follows:

   (1) The assessment is held once every semester. A doctoral student should apply for assessing the subject within the first two weeks of each semester, and submit documents related to the competency assessment, such as course completion certificate, transcript, scores, and ranking.

   (2) The Academic and Faculty Affairs Committee, composed of faculty members of the department, is responsible for basic competency assessment. The review committee shall be composed of 5 to 7 full-time or program teachers from the department; the head of the department is an ex officio member; and the supervising professor of the applicant must not serve as a member of the review committee. However, the review committee may invite the supervising professor to make explanations as a non-voting attendee if necessary. The review meeting should be held within the first four weeks in each semester. The review is conducted based on the evidence and data provided by the student.

   (3) The passing criteria for basic competency assessment is a score of 80 (equivalent to A-) or higher grade for each course submitted for the assessment.

III. Professional competency assessment:

1. Oral examination is employed for professional competency assessment. A doctoral student should write a technical report about his/her research results after the applicant has enrolled the doctoral program, and submit it to the oral examination committee. The research results should include important conference papers, journal papers, and system implementations.

2. For professional competency assessment, the supervising professor of the applicant should convene an oral examination committee composed of 3 to 5 full-time or program teachers from the department to conduct an oral examination based on the research results of the applicant. Any applicant with an average score of 70 or higher in the oral examination pass the assessment.

3. Professional competency assessment shall be limited to one time.

IV. These guildlines and any amendment hereto shall be implemented after being adopted by the Faculty Affairs Meeting.

Fields	Subjects
Artificial intelligence	1. Artificial intelligence 2. Data mining 3. Machine learning 4. Data stream mining 5. Algorithm 6. Data structure 7. Numerical computation
Multimedia	1. Computer graphic 2. Computer vision 3. Image processing 4. Human-computer interaction 5. Pattern recognition
Computer networking and communication	1. Computer networking 2. Wireless and mobile networks 3. Network communication protocols 4. Software-defined networking and network function virtualization
Embedded systems, network security, and others	1. Computer architecture 2. Computer organization 3. Embedded systems 4. Real-time operating systems 5. Compiler design 6. Computer-aided design for VLSI system 7. Network security 8. Wireless communication and security 9. Network security technologies and practices 10. Practices of information security 11. Intrusion detection and prevention 12. Information security