International Doctoral Program of Control Science and Engineering

Confer a Degree Category: Doctor of Engineering

Program Code and Name of the First Level Discipline:

0811 Control Science and Engineering

Program Code and Name of the Second Level Discipline:

081101 Control Theory and Control Engineering
081102 Measurement Technology and Automation Device
081103 System Engineering
081104 Patten Recognition and Intelligent System
081105 Navigation, Guidance and Control
081106 Circuit and system control
081107 Power Electrical and Drive Control

Coding Unit：School of Automation

Version: 2017

1. Program Overview

The Doctoral Program is fit for those postgraduates who hold the bachelor's or master's degree of Control Science and Engineering and are enrolled for the Doctoral Program. Qualified graduates will be conferred the Doctor's Degree of Philosophy. The program focuses on the basic theories, methods and techniques of Control Science and Engineering, including Control Theory and Control Engineering, Measurement Technology and Automation Device, System Engineering, Patten Recognition and Intelligent System, Navigation, Guidance and Control, Circuit and system control, Power Electrical and Drive Control.

2. Research Direction

3.1 Modeling, control and optimization of complex industrial processes
3.2 Detection, analysis technology and automation device of industrial processes
3.3 Intelligent control and intelligent system
3.4 Automation system technology and equipment of industrial processes
3.5 Complex system control theory and its application

3. Educational Objectives

The objectives are to inculcate the students with the high-level discipline as well as the specialized skills to pursue scientific research, technological development and engineering applications in the area of Control Science and Engineering and in other related fields. Through the program, the students can build a solid foundation of Control Science and Engineering.

4. Credit Requirements and Course Arrangement

For full-time doctoral candidates in the program, the general length of schooling is from four to six years (at least 4 years). For those doctoral candidates at the undergraduate level, the general length of schooling is from four to six years (at least 4 years).

The course learning time is 20 weeks. The credits should be no less than 26 (including Training Courses). There will be a qualification examination after the doctoral courses are accomplished. The *Survey of China and Communicative Chinese* are compulsory courses, which will be arranged by the International Exchange and Cooperation Office and taught in Chinese language.

Course Arrangement for Doctoral Candidates of Control Science and Engineering

Courses Category	Courses Number	Courses Name	Hours	Credit	Term	Remarks
Public Courses	10000008101	Communicative Chinese	64	3	1,2	Compulsory
	11000008102	Survey of China	32	2		
Core Courses	46081101201	Complex process control technology and applications	32	2	1	Compulsory
	46081101202	Principle and application of intelligent system	32	2	1	
	46081101203	Multi-agent System	32	2	1	
	46081111207	Scientific Writing and Academic Regulation	32	2	1	
Specialized Courses	46081101301	Advanced Robotics	32	2	1	
Seminar	00000000502	Academic Exchanges and Academic Report		8	2	Compulsory
Training Courses	00000000601	Qualification's examination		1	3	Compulsory
	00000000602	Thesis Proposal		1	3	
	00000000620	Mid-term Examination		1	3	
Additional Courses	Courses of Control Science and Engineering for Master's Degree					Must choose two courses if not majoring in Automation during the Master's Program

5. Academic Exchanges and Academic Report

In the condition that doctoral students have obtained the necessary credits for those required, optional and training courses, it is encouraged to improve the weight of research discussion and communication in the doctoral program credits. On one hand, it is necessary to give more time to the doctoral students and their supervisor, in order to actively promote the interaction between the students and their supervisor. On the other hand, it is necessary for the international doctoral students to participate high-level academic exchange activities, in order to improve their academic performance.

A seminar will be held each year for research discussion and cooperation between international graduate students and Chinese graduate students. Each international graduate student must submit a full paper to the seminar for getting a credit, which is a summary of the research work done. The seminar is open to all the graduate students of the whole departments. Several advisors will be invited to attend the seminar for giving direct tutoring.

For the "academic exchanges and academic report" training course, the specific requirements are as follows:

(1) 3 credit will be given to those PhD candidate students, who attend a high quality international academic conference and make an academic presentation;

(2) 2 credit will be given to those PhD candidate students, who make an academic presentation in a 211 or 985 university other than CSU;

(3) 2 credit will be given to those PhD candidate students, who make a public academic presentation in School of Automation, CSU, before applying PhD dissertation defense;

(4) Each PhD candidate student must submit papers twice to the Academic Annual Conference organized by School of Automation. Those two accepted papers will be counted as 1 credit. 1 credit will be given to those PhD candidate students, who make an academic presentation in the Academic Annual Conference of our school;

(5) Each PhD candidate student must attend academic reports 20 times, which counts 1 credit;

(6) 0.5 credit will be given to those PhD candidate students, who attend a domestic academic conference and make a post presentation.

6. Qualification Examination

Doctoral candidates should have to take part in the qualification examination, before making their dissertation proposal to determine their research topic. Examination consists of written and oral examinations, and will be carried out according to the First Level Discipline. Details are given as following:

1) Social behavior, moral and scientific attitude;
2) The implementation of individual training plan and curriculum learning grade;
3) The basic theories, professional knowledge, modern science and technology knowledge and skills;
4) The understanding of the disciplines, the dynamics and progress of the latest research in related fields at national and international levels.
5) The quality of scientific research, innovation and development potential.

Doctoral candidates have two chances to pass the qualification examination; otherwise they will be required to quit the program.

7. Dissertation Proposal

Doctoral candidates should review a minimum of 120 literatures based on the forefront of the discipline. Then, they should determine a topic with great practical or potential values which they find that they can make innovations in theoretical or technical aspects. There will be an open report held in public within the range of the discipline. Students have an additional chance to finish their dissertation proposals if it was not adopted at the first time (However, it should be finished in the following year).

Doctoral candidates should fill out the dissertation proposal online in the "Graduate Education and Management Information System". Also, after their proposals are adopted, they are required to submit a hard copy to the Graduate Student Management Office for archival purpose.

8. Research Training

Research Training is a required course for doctoral student. Each doctoral student should participate in at least one research project. The purpose of this training is to enforce international doctoral students to obtain the right research method, develop their capability to conduct research or special technique. The credit will be given to students once their supervisor approve that they have met the requirement.

9. Examination and Filtration

A comprehensive summary, evaluation and assessment will be carried out at the end of each academic year, including social performance, course scores, and academic achievements. The examination results will be used to adjust the scholarships and bursaries. Students who fail in the examination will be required to quit the doctoral program.

10. Regulations for Doctor Degree

The shortest working time on the doctoral thesis should not be less than 2 years. Dissertation should be completed independently under the guidance of the supervisor, and in accordance with the format designed by the school. Dissertation should demonstrate that the student has achieved the requirements of educational objectives.

1）Requirements on Academic Papers

During the period of the program, the doctoral candidates should meet one of the following two requirements on their academic achievements: (1) publish at least 3 papers in journals indexed by SCI or EI within Control Science related area, one of which must be SCI journal, and at least one of which should be officially published before pre-defense; or (2) publish at least 1 paper in an international Computer Science related journals official identified by CSU as a journal within JCR 1 district, the impact factor of which is greater than or equal to 1.0. In all the above mentioned papers, "*School of Automation, Central South University*" should be the first affiliation. The doctoral candidate can be either the first author, or the second author while his/her supervisor is the first author. The "*Regulations for Earlier Graduation" please see the Attachment 1.*

2）Dissertation

The shortest working hours on the doctor's dissertation shall not be less than 12 months. Dissertation should be completed independently under the guidance of the supervisor, and in accordance with the school format. Dissertation should demonstrate that the student has achieved the requirements of training objectives.

Progress and assessment will be conducted, mainly on the progress of dissertation, results, problems and the gap between the current and expected achievements. Doctoral candidates should propose the possible solutions or demands for addressing the problems they are studying. The work should be carried out in the early October each year. The doctoral students who have weak comprehensive ability, slow progress on paper, or inefficient time and efforts would be warned or disposed according to the Student Management Regulations.

3）Dissertation review, Defense and Degree-granting

Acting on "Degree-granting regulations of Central South University", "Regulations of dissertation defense of Central South University ", "Regulations of dissertation review of Central South University"

Attachment 1.

Regulations for Earlier Graduation

According to the register administrative provision of Central South University for graduate students, the minimum length of study for both PhD and master students is 3 years (4 years after 2017 for PhD students). However, for those excellent graduate students, they can apply for earlier graduation. To apply for earlier graduation, the following basic requirements and additional necessary conditions need to be satisfied.

1. Basic Requirements

(1) Good character, and actively participate in academic activities, such as laboratory research, scientific services, and social practice;

(2) Good academic performance without records of failure courses;

(3) The evaluation result for each stage assessment, including research proposal should be A or above;

(4) Strong research and development capability, reflected by prominent novel research or engineering achievement;

(5) Fulfill the requirement of each training session for graduate students.

2. Necessary Conditions

(1) The GPA for all courses must be among the top 20% from all graduate students with the same major and grade;

(2) During the period of PhD study, publish 3 research papers in journals indexed by SCI, with the requirements: (a) "School of Automation, Central South University" should be the first affiliation; (b) the doctoral candidate can be either the first author, or the second author while his/her supervisor is the first author; (c) at least one of the three paper must be published in a journal recognized by CSU as a journal within JCR 1 district, with the impact factor being greater than or equal to 1.0.

(3) During the period of master study, publish 1 research papers in journals indexed by SCI, with the requirements: (a) "School of Automation, Central South University" should be the first affiliation; (b) the master candidate can be either the first author, or the second author while his/her supervisor is the first author; (c) the paper must be published (or accepted) in a journal with the impact factor being greater than or equal to 1.0.

3. Application Procedure and Time

Every October 28-31, a graduate student can submit the following documents to graduate office：

(1) An application form of CSU graduate student’s earlier graduation, which can be downloaded from the website of CSU graduation administrative school, signed by the advisor;

(2) Print a transcript from the CSU graduation student information management system;

(3) The research proposal and related evaluation documents;

(4) The documents for the necessary conditions, such as the original papers and the corresponding copies.

(5) The draft of PhD dissertation of master student’s thesis.

Upon receiving the application documents from the graduate student himself/herself, the graduate office will submit those documents to the Degree Committee of School of Automation for discussion on the first week of November. If the application has been approved through discussion, it will be shown in the website of School of Automation for 3 days. After that, if no objection has been issued, the application documents will be submitted to CSU graduate student administrative school for approvement.