

# Doctoral Program in Automation

## 1. Introduction

Automation technology is widely used in many fields including industry, agriculture, aerospace and national defense. The specialty of automation has a long history, strong faculty force, and superior teaching facilities. It is a Jiangsu provincial key brand discipline and a national characteristic discipline. The discipline has gained many honors and titles, such as national distinguished teachers and national excellent teaching teams. The faculty advocates the student-centered teaching philosophy and has built a set of practical education system for training system designers.

The discipline focuses on the following four research areas: motion control systems, process control systems, network control systems, and embedded control systems. The discipline has several national and provincial essence courses, a national bilingual teaching demonstration course, and a provincial automation experimental teaching demonstration center which plays a great role in the cultivation of students' scientific literacy and innovation capabilities. The undergraduates have won more than twenty outstanding awards, first-place awards and second-place awards in various national undergraduate competitions, such as the Challenge Cup National Undergraduate Curricular Academic Science and Technology Works Competition, the Industrial Automation Challenge Contest, the National Undergraduate Intelligent Car Contest, the Chinese Robot Contest, and the National Undergraduate Electronic Design Contest. The graduates can undertake system design, product manufacture, and software/hardware development in automatic filed. They possess strong practical ability and can adapt to the needs of the society. The employment rate of the past three years exceeded 99% and over 60% of the graduates were admitted to various universities for further study.

## 2. Research Directions

- (1) Automatic control theory and application;
- (2) Measurement technology and automatic equipment;
- (3) Complex engineering system modeling, control and optimization;
- (4) Pattern recognition and intelligent system;
- (5) Navigation, guidance and control

## 3. Duration of studies

Full time PhD students are expected to complete their studies and earn their degrees in 4 to 8 years, and they will be disqualified from the program after 8 years.

## 4. Credits requirements

Students are required to complete at least 18 degree credits from courses in Section 5 with a minimum of 16 coursework credits and 2 obligatory courses.

## 5. Curriculum

Course No.	Course Name	Semester	Credits
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<b><i>I. Fundamental Courses</i></b>			<b>4</b>
L371A002	Chinese	Fall	2
L371A003	Introduction to Chinese Classics	Fall	2
<b><i>II. Core Courses</i></b>			<b>6+</b>
L113A009	Functional Analysis	Fall	3
L113A010	Matrix Analysis and Computation	Fall	3
L110B005	Probability Theory & Stochastic Processes	Fall	3
L110B004	Nonlinear System Theory	Fall	2
B110B005	Stability & Robustness Theory	Spring	2
<b><i>III. Major Electives</i></b>			<b>4+</b>
L110C010	Cybernetics	Fall	2
L110C016	Operational Research	Spring	2
L110C017	Optimization Theory & Techniques	Fall	2
L110C018	Robust & Adaptive Control	Spring	2
L110C011	Intelligent Control Theory	Fall	2
L110C012	Latest Developments on Control Theory & Engineering Discipline	Spring	2
L110C015	Latest Developments on System Engineering Discipline	Spring	2
L110C013	Latest Developments on Measurement Technique & Automation Equipment Discipline	Spring	2
L110C014	Latest Developments on Navigation, Guidance & Control Discipline	Spring	2
<b><i>IV. Thesis Credits</i></b>			
L0000003	Dissertation Proposal II	Fall	2
L0000004	Academic Activities II	Spring	
<b>Total Credits Required</b>			<b>18+</b>
NOTE: Graduate students are usually expected to meet the course requirements in the first academic year, including: I. Fundamental Courses, II. Core Courses, and sufficient elective courses in III. Major Electives.			

## 6. PhD Dissertation Topic and Research Proposal

PhD dissertation proposal should be no less than 10000 words long and has at least 80 references, half of which must be published in the recent 5 years. A PhD student should choose a research topic for the PhD dissertation and spend no less than 2 years on the dissertation research and writing, all under an advisor's guidance.

Detailed regulations and requirements on PhD dissertation are documented in the "*NJUST Regulations about the Topic Selection, Research Proposal and Composition of Postgraduate Theses and Dissertations*". The PhD dissertation research proposal writing and defense should be completed in no later than the second academic year of the program.

## 7. Publication

To meet the degree requirements, a PhD student is required to have a certain number of academic publications related to the dissertation research. Detailed requirements are documented in "*NUST regulations on a postgraduate's publications of their research work*".

## **8. PhD Dissertation Requirements**

Detailed regulations and requirements on PhD dissertation are documented in the "*NJUST Regulations about the Topic Selection, Research Proposal and Composition of Postgraduate Theses and Dissertations*", and "*NUST Style Sheet for Theses and Dissertations*". For a joint effort with others, or a follow-up of previous work, the student should clearly specify his/her contribution to the thesis.