南京理工大学

博士留学生

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研究生院

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# Doctoral Program in Mechanical Engineering

**1. Introduction**

The Mechanical Engineering discipline holds a first-class Master's degree-granting in China and doctorate-granting with post-doctoral program of Mechanical Engineering. It covers the following five second-level disciplines: mechanical manufacturing and automation, mechanical design and theory, mechatronic engineering, vehicle engineering and industrial engineering. Mechatronic engineering is the key discipline of Jiangsu Province.

**2. Research directions**

As the first-level discipline of Nanjing university of Science and technology for the mechanical engineering, the key research directions are:

1. Methodology of modern mechanical design
2. Servo precision transmission and mechanism
3. Intelligent robots and bionic technology
4. Digital design and manufacturing
5. Advanced processing technology and equipment
6. Intelligent machinery, Testing & control
7. MEMS
8. Smart & intelligent electromechanical systems
9. Mechanics-electronics-hydraulics technology
10. Dynamics & dynamic simulation of electromechanical system
11. Modern vehicle design theory, methods and techniques
12. Vehicle electronic control and intelligent

**3. Duration of studies**

Full time PhD students are expected to complete their studies and earn their degrees in 4 to 6 years, and they will be disqualified from the program after 6 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** |
| ***I. Fundamental Courses*** | **4** |
| L371A002 | Chinese | Fall | 2 |
| L371A003 | Introduction to Chinese Classics | Fall | 2 |
| ***II. Core Courses*** | **6+** |
| L113A018 | Multi-body system dynamics | Spring | 2 |
| L113A017 | Elastic-plastic mechanics | Spring | 3 |
| L113A008 | Stochastic Mathematics | Fall | 3 |
| L113A016 | Continuum mechanics | Fall | 2 |
| ***III. Major Electives*** | **4+** |
| L101C011 | Academic frontier of Mechanical engineering  | Spring | 2 |
| L101C012 | Disciplinary thematic studies (seminar)  | Spring | 2 |
| L101C014 | Engineering Measurement Technologies | Spring | 3 |
| L101C015 | Theory of Mechanism and Robotics  | Spring | 3 |
| ***IV. Thesis Credits*** |
| L0000003 | Dissertation Proposal II | Fall | **2** |
| L0000004 | Academic Activities II | Fall |
| **Total Credits Required** | **18+** |
| 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.

**Doctoral Program in Chemical Engineering & Technology**

**1. Introduction**

The primary discipline of Chemical Engineering and Technology contains six secondary discipline master programs in chemical engineering, chemical technology, applied chemistry, bio-chemical, industrial catalysis, and explosions chemical. This primary discipline has a PhD program and a postdoctoral program. The secondary disciplines have some state-level key disciplines, national special majors, provincial brand majors, the National Chemistry Experimental Teaching Demonstration Center, and the National Chemical Engineering Practice Professional Education Center.

**2. Research Directions**

1. Chemical reaction engineering
2. Fine chemical engineering
3. Industrial catalyst study
4. Pyrotechnic & pyrotechnics technique
5. Biopharmaceutical

**3. Duration of studies**

Full time PhD students are expected to complete their studies and earn their degrees in 4 to 6 years, and they will be disqualified from the program after 6 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** |
| ***I. Fundamental Courses*** | **4** |
| L371A002 | Chinese | Fall | 2 |
| L371A003 | Introduction to Chinese Classics | Fall | 2 |
| ***II. Core Courses*** | **8+** |
| S103C009 | Organic Reactions | Spring | 2 |
| B103B004 | Design of Organic Moleculars | Fall | 2 |
| S103C001 | Catalysis in Asymmetric Synthesis | Fall | 2 |
| S103C005 | Journal-Style Scientific Writing Skills | Spring | 1 |
| S103C031 | Pyrotechnics | Spring | 2 |
| S103C030 | Modern Instrumental Analysis | Fall | 2 |
| ***III. Major Electives*** | **4+** |
| S103C002 | Progress in Biological Techniques | Spring | 2 |
| S103C028 | Chemistry & Technology of High Explosives | Fall | 2 |
| S103C029 | Chemistry & Technology of Propellants | Fall | 2 |
| S103B003 | Thermal Safety of Chemical Process | Fall | 2 |
|  |  |  |  |
| ***IV. Thesis Credits*** |
| L0000003 | Dissertation Proposal II | Fall | **2** |
| L0000004 | Academic Activities II | Fall |
| **Total Credits Required** | **18+** |
| 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.

# Doctoral Program in Environmental Science & Engineering

**1. Introduction**

Nanjing University of Science & Technology (NUST) was one of the earliest universities to establish the major of Environmental Engineering (EE) in China. The major was established in 1979 and started to recruit undergraduates in 1980. We began to offer master and doctoral programs in EE in 1987 and 2000 respectively, master program in Environmental Science (ES) in 2003, and doctoral program and postdoctoral fellowship in Environmental Science & Engineering (ESE) in 2010 and 2012 respectively. EE was also elected as a key discipline of the “Tenth, Eleventh and Twelfth 5-Year Guideline” of Jiangsu province as well as of the Ministry of Industry and Information Technology.

**2. Research Directions**

1. Wastewater treatment and resource reuse engineering
2. Air pollution control engineering
3. Environmental biotechnology
4. Environmental monitoring technology

**3. Duration of studies**

Full time PhD students are expected to complete their studies and earn their degrees in 4 to 6 years, and they will be disqualified from the program after 6 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**](http://dict.youdao.com/w/curriculum/)

|  |  |  |  |
| --- | --- | --- | --- |
| **Course No.** | **Course Name** | **Semester** | **Credits** |
| ***I. Fundamental Courses*** | **4** |
| L371A002 | Chinese | Fall | 2 |
| L371A003 | Introduction to Chinese Classics | Fall | 2 |
| ***II. Core Courses*** | **8+** |
| L113A012 | Intelligent Optimization Algorithms | Fall | 2 |
| L113A014 | Wavelet Analysis | Spring | 3 |
| L102B003 | Application & Theory of Water Treatment | Spring | 2 |
| L102B004 | Air Pollution & its Control | Spring | 2 |
| L102B005 | Environmental Chemistry | Fall | 2 |
| S103C005 | Journal-Style Scientific Writing Skills | Spring | 1 |
| ***III. Major Electives*** | **4+** |
| L102C005 | Environmental Biotechnology | Fall | 2 |
| L102C006 | Fundamentals & Materials of Membrane Separation | Fall | 2 |
| S102B007 | Solid Wastes Disposal and Resource | Spring | 2 |
| S102C005 | Ecomaterials | Spring | 2 |
| ***IV. Thesis Credits*** |  |
| L0000003 | Dissertation Proposal II | Fall | **2** |
| L0000004 | Academic Activities II | Fall |
| **Total Credits Required** | **18+** |
| 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.

# Doctoral Program in Optical Engineering

**1. Introduction**

The Optical Engineering discipline at the Nanjing University of Science and Technology was developed from the Artillery Command System major at the PLA Military Engineering Institute that was founded in 1953. In 1986, it was qualified as a doctoral program; in 1998, it was awarded for Post-Doctoral Mobile Station as well as "Yangtze River Scholar" Scheme by the State Education Commission; in 2002, it was established as the key discipline by both the National Defense Division and Jiangsu province; in 2005, it was approved as the national key discipline cultivation base at Jiangsu province; in 2007, it was established as a first-rate national key discipline as well as national defense characteristic discipline; in 2010, it was rated as the Jiangsu province superior discipline; in 2012, it was approved as the key discipline by the Ministry of Industry and Information Technology. In the 2013 national academic evaluation, it was rated as the 8th best national program in its category, elevated from the previous 9th finish, and it was among the top 1% of the ESI international disciplines.

**2. Research Directions**

1. Optoelectronic information detection and image processing
2. Optical testing and intelligent optoelectronic instruments
3. Laser physics and application technology
4. Optoelectronic physics and technology
5. Bio-medical photonics
6. Micro- and nano-optoelectronic devices and applications
7. Optical fiber technology and applications

**3. Duration of studies**

Full time PhD students are expected to complete their studies and earn their degrees in 4 to 6 years, and they will be disqualified from the program after 6 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** |
| ***I. Fundamental Courses*** | **4** |
| L371A002 | Chinese | Fall | 2 |
| L371A003 | Introduction to Chinese Classics | Fall | 2 |
| ***II. Core Courses*** | **6+** |
| L113A014 | Wavelet Analysis | Spring | 3 |
| L113A008 | Stochastic Mathematics | Spring | 3 |
| L113A010 | Matrix Analysis and Computation | Spring | 3 |
| B104B001 | Principle of Optics | Spring | 3 |
| L104B008 | Modern Photonics | Spring | 3 |
| ***III. Major Electives*** | **4+** |
| L104C015 | Progresses in Modern Optical Information Technology | Spring | 2 |
| L104C016 | Progresses in Modern Optical Testing | Spring | 2 |
| L104C014 | Progresses in Laser Physics | Spring | 2 |
| L104C017 | Progresses in Optoelectronic Physics Technology  | Spring | 2 |
| L104C012 | Progresses in Micro-and Nano-optoelectronic Devices And Applications | Spring | 2 |
| L104C013 | Progresses in Biophotonics | Spring | 2 |
| ***IV. Thesis Credits*** |
| L0000003 | Dissertation Proposal II | Fall | **2** |
| L0000004 | Academic Activities II | Fall |
| **Total Credits Required** | **18+** |
| 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.

**Doctoral Program in Information and Communication Engineering**

**1. Introduction**

Information and Communication Engineering is to study new theory, new methodology and new technology of all kinds of electronic, communication, information systems and related signal processing aspects based on information source coding, transmission, exchange and information networks. Based on information science and engineering, this discipline, with its goals to develop China’s electronic information industries, focuses on the research, design, development and implementation of electronics and communication information systems. It includes communication and information systems on communications, as well as theory and technology on information signal and information processing.

**2. Research Directions**

1. Wireless networks and communications
2. Modern signal processing

**3. Duration of studies**

Full time PhD students are expected to complete their studies and earn their degrees in 4 to 6 years, and they will be disqualified from the program after 6 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** |
| ***I. Fundamental Courses*** | **4** |
| L371A002 | Chinese | Fall | 2 |
| L371A003 | Introduction to Chinese Classics | Fall | 2 |
| ***II. Core Courses*** | **6+** |
| L113A013 | Basis of Modern Analysis  | Spring | 2 |
| L113A014 | Wavelet Analysis | Spring | 3 |
| L113A010 | Matrix Analysis and Computation | Spring | 3 |
| L104B007 | Space-time Wireless Communications  | Spring | 2 |
| ***III. Major Electives*** | **4+** |
| L104C009 | Modern Digital Communications Technology | Spring | 2 |
| L104C008 | Advanced Signal Processing | Spring | 2 |
| L104C011 | New Advances in Signal Processing | Spring | 2 |
| L104C010 | New Advances in Communications  | Spring | 2 |
| ***IV. Thesis Credits*** |
| L0000003 | Dissertation Proposal II | Fall | **2** |
| L0000004 | Academic Activities II | Fall |
| **Total Credits Required** | **18+** |
| 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.

# Doctoral Program in Computer Science and Technology

**1. Introduction**

The School of Computer Science and Engineering at NUST consists of several teaching and research departments and laboratories, namely the Department of Computer Science and Technology, the Department of Software Engineering, the Department of Intelligent Science and Technology, the Department of Digital Media Theory and Engineering, the Department of Computer Network and Communication Technology, the Computer Science and Engineering Experimental Center, the Computer Application Institute, the Information Processing and Security Technology Institute, and the Intelligent Robotics Institute. The school also owns the Ministry-of-Education Key Laboratory of "Intelligent Perception and Systems for High-Dimensional Information", and the Jiangsu Key Laboratory of Image and Video Understanding for Public Safety.

The school has a national key discipline in "Pattern Recognition and Intelligent Systems", two Jiangsu provincial key disciplines in “Computer Science and Technology” and "Software Engineering". We own primary discipline doctoral programs in "Computer Science and Technology" and "Software Engineering", and secondary discipline doctoral program in "Pattern Recognition and Intelligent Systems" and the corresponding post-doctoral workstations. We also provide master programs in "Computer Science and Technology", "Pattern Recognition and Intelligent Systems", "Software Engineering", and "Biomedical Engineering". The school's programs are supported by the national "985" Project innovation Platform.

**2. Research Directions**

1. Pattern recognition and intelligent system
2. Computer science and technology
3. Software engineering

**3. Duration of studies**

Full time PhD students are expected to complete their studies and earn their degrees in 4 to 6 years, and they will be disqualified from the program after 6 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** |
| ***I. Fundamental Courses*** | **4** |
| L371A002 | Chinese | Fall | 2 |
| L371A003 | Introduction to Chinese Classics | Fall | 2 |
| ***II. Core Courses*** | **6+** |
| L113A010 | Matrix Analysis and Computation | Spring | 3 |
| L113A008 | Stochastic Mathematics | Spring | 3 |
| L113A012 | Intelligent Optimization Algorithms | Fall | 2 |
| B106B002 | Advanced System Software Theory and Technologies | Spring | 2 |
| S106C006 | Machine Learning  | Fall | 2 |
| ***III. Major Electives*** | **4+** |
| L106C008 | Information Security and Applied Cryptography | Fall | 2 |
| L106C007 | Computer Vision | Fall | 2 |
| L106C009 | Pattern Recognition | Spring | 2 |
| B106C002 | Services Computing and Business Process Management(II) | Spring | 2 |
| ***IV. Thesis Credits*** |
| L0000003 | Dissertation Proposal II | Fall | **2** |
| L0000004 | Academic Activities II | Fall |
| **Total Credits Required** | **18+** |
| 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.

**Doctoral Program in Mechanics**

**1. Introduction**

Mechanics and Ballistics, founded in 1960, is a national key major. It offers several bachelor, master and doctoral programs, as well as a post-doctoral program. The mechanics discipline, based on mechanics theory and its applications, focuses on the fundamental theory, numerical simulations and test techniques for systems of civil use and military use. As a project technical chief or technology topics chief, our school presided over and completed a lot of key projects, including 6 items of the State 973 Projects, 5 items of the 863 Projects, 4 items of the National Security Specials, more than 100 items of the National Natural Science Foundations, national & ministerial key projects, and 3 items of international cooperation projects, with a total research funding of more than RMB300 million. Among them, 2 items won the National Technology Invention Second Prizes (ranking 1st) and 2 items won the National Science & Technology Progress Second Prizes (ranking 3rd).

Our school has more than 90 invention patents authorized, and over 10 monographs and 500 SCI and EI papers published. Among the faculty members are more than 20 high-level talents, including academicians, the State 973 Technical Chiefs, New Century Excellent Talents, etc. The school has the Transient Physics State Key Laboratory, and the Mechanical Experiment Demonstration Center of Jiangsu Province, the total value of the experimental equipment exceeding one hundred million. The laboratories cover an area of more than 20,000 square meters, and have a collection of more than 20 million books.

**2. Research Directions**

1. Launch dynamics
2. Theory of multibody system dynamics & its applications
3. Theory of elastic-plastic mechanics & its applications
4. Fluid control & high-speed air dynamics
5. Detonation propulsion & noise control
6. Explosion mechanics & security, ballistics
7. Ballistics, flight dynamics & control

**3. Duration of studies**

Full time PhD students are expected to complete their studies and earn their degrees in 4 to 6 years, and they will be disqualified from the program after 6 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** |
| ***I. Fundamental Courses*** | **4** |
| L371A002 | Chinese | Fall | 2 |
| L371A003 | Introduction to Chinese Classics | Fall | 2 |
| ***II. Core Courses*** | **8+** |
| L108B005 | Sensitivity Analysis & Optimization  | Fall | 2 |
| L113A018 | Multibody System Dynamics  | Spring | 3 |
| S108C010 | Transfer Matrix Method for Multibody Systems | Spring | 3 |
| B108C003 | Structural Dynamics & Aerodynamic Elasticity | Fall | 3 |
| ***III. Major Electives*** | **3** |
| L108C010 | Advanced Launch Dynamics | Spring | 3 |
| ***IV. Thesis Credits*** |
| L0000003 | Dissertation Proposal II | Fall | **2** |
| L0000004 | Academic Activities II | Fall |
| **Total Credits Required** | **18+** |
| 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.

**Doctoral Program in Control Science and Engineering**

**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 6 years, and they will be disqualified from the program after 6 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**](http://dict.youdao.com/w/curriculum/)

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| **Course No.** | **Course Name** | **Semester** | **Credits** |
| ***I. Fundamental Courses*** | **4** |
| L371A002 | Chinese | Fall | 2 |
| L371A003 | Introduction to Chinese Classics | Fall | 2 |
| ***II. Core Courses*** | **6+** |
| L113A009 | Functional Analysis | Fall | 3 |
| L113A010 | Matrix Analysis and Computation | Spring | 3 |
| L110B005 | Probability Theory & Stochastic Processes | Fall | 3 |
| L110B004 | Introduction to Output Regulation Theory | Fall | 2 |
| B110B005 | Stability & Robustness Theory | Spring | 2 |
| ***III. Major Electives*** | **4+** |
| L110C003 | Hybrid systems Modeling, Control & Applications to complex systems | Spring | 2 |
| L110C009 | Time delay systems | Spring | 2 |
| L110B002 | Introduction to Optimal Control | Fall | 2 |
| L110C018 | Filtering, Estimation Theory and Application | Spring | 2 |
| L110C011 | Intelligent Control & Application | 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 |
| ***IV. Thesis Credits*** |
| L0000003 | Dissertation Proposal II | Fall | 2 |
| L0000004 | Academic Activities II | Fall |
| **Total Credits Required** | **18+** |
| 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.

# Doctoral Program in Mathematics

**1. Introduction**

Mathematics is a scientific system to study quantitative relation, space form and the deduction system, etc. It is a subject with rigor, logicality, abstract, accuracy, creativity and imagination. Mathematics plays an important role in science research, technology, engineering, economics, finance and management.

We own primary discipline doctoral and master programs in Mathematics including five secondary discipline programs "Pure Mathematics", "Numerical Mathematics", "Applied Mathematics", "Probability and Statistics", "Operations Research and Control Theory".

**2. Research Direction**

1. Partial Differential Equations
2. Image Processing
3. Optimization
4. Geometrical Analysis
5. Stochastic Analysis and Statistics
6. Dynamical System
7. Control Theory for Uncertain Systems

**3. Duration of studies**

Full time PhD students are expected to complete their studies and earn their degrees in 4 to 6 years, and they will be disqualified from the program after 6 years.

**4. Credits requirements**

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

**5. Curriculum**

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| --- | --- | --- | --- |
| **Course No.** | **Course Name** | **Semester** | **Credits** |
| ***I. Fundamental Courses*** | **4** |
| L371A002 | Chinese | Fall | 2 |
| L371A003 | Introduction to Chinese Classics | Fall | 2 |
| ***II. Core Courses*** | **8+** |
| L113B014 | parse and Low-rank Approximation Modeling | Spring | 3 |
| L113B009 | Geometric Analysis on Manifolds | Spring | 3 |
| L113B012 | Stochastic Analysis | Fall | 3 |
| L113B013 | Theory and Algorithm on Development of Optimization  | Fall | 3 |
| L113B011 | Stability Theory of Dynamical Systems | Fall | 3 |
| ***III. Major Electives*** | **4+** |
| L113C014 | Development of Analysis and Geometry | Spring | 2 |
| L113C015 | Development of Numerical Analysis and Optimization | Spring | 2 |
| L113C016 | Development of Stochastic and Financial Mathematics | Spring | 2 |
| L113C020 | Development on Mathematical Theory in Control and Inverse Problem in Mathematics | Spring | 2 |
| ***IV. Thesis Credits*** |
| L0000003 | Dissertation Proposal II | Fall | **2** |
| L0000004 | Academic Activities II | Fall |
| **Total Credits Required** | **18+** |
| 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 anddefense 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 effortwith others, or a follow-up of previous work, the student should clearly specify his/her contribution to the thesis.

# Doctoral Program in Materials Science and Engineering

**1. Introduction**

Materials Science is a subject field researching on the relationship among the formation, structure, processing, property and performance of materials. It is committed to the performance optimization, processing optimization, and development & application of materials.

**2. Research Directions**

(1) New metal and advanced composite materials

(2) Nano-materials and technology

(3) Advanced functional materials

(4) New energy materials

(5) Biomaterials

(6) Inorganic Non-metallic Materials

(7) Surface engineering

(8) Advanced materials processing technology

(9) Bonding engineering

**3. Duration of studies**

Full time PhD students are expected to complete their studies and earn their degrees in 4 to 6 years, and they will be disqualified from the program after 6 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**](http://dict.youdao.com/w/curriculum/)[**Provision**](http://dict.youdao.com/w/provision/)

|  |  |  |  |
| --- | --- | --- | --- |
| **Course No.** | **Course Name** | **Semester** | **Credits** |
| ***I. Fundamental Courses*** | **4** |
| L371A002 | Chinese | Fall | 2 |
| L371A003 | Introduction to Chinese Classics | Fall | 2 |
| ***II. Core Courses*** | **8+** |
| L113A015 | Elastic Mechanics | Spring | 3 |
| S116B007 | Quantum Mechanics and Solid State Physics | Fall | 3 |
| S116B003 | Phase Transformation and Kinetics in Materials | Fall | 3 |
| S116B004 | Physical Foundation for Crystal Growth | Fall | 3 |
| ***III. Major Electives***  | **4+** |
| S116B009 | Advanced Characterization Techniques for Materials | Spring | 2 |
| S116B010 | Mechanics of Composite Materials | Fall | 2 |
| ***IV. Thesis Credits*** |
| L0000003 | Dissertation Proposal II | Fall | **2** |
| L0000004 | Academic Activities II | Fall |
| **Total Credits Required** | **18+** |
| 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.

**Doctoral Program in Power Engineering and Engineering Thermophysics**

**1. Introduction**

Power Engineering and Engineering Thermophysics of Nanjing University of Science and Technology (NUST) is the first class discipline for doctoral degree, the key discipline of Jiangsu province, and also a key construction brand discipline of NUST. MIIT Key Laboratory of Thermal Control of Electronic Equipment, National Key Laboratory of Transient Physics and Nanjing Efficient Heat Transfer Engineering Technology Center are affiliated to this discipline.

**2. Research Directions**

(1) Heat and mass transfer and its enhancement.

a. Understanding and characterizing micro/nano-scale heat and mass transfer.

b. Theory and technology for thermal management of electronic devices.

c. Understanding and tuning heat and mass transfer for extreme conditions.

d. Phase change heat transfer and its enhancement.

(2) Target infrared radiation and radiative heat transfer.

a. Theory and technology for near/far-field thermal radiation.

b. Target infrared radiation simulations.

c. Measurements of material radiative properties.

d. Characterizing and tuning thermal radiation.

(3) Clean combustion and pollutants control.

a. Advanced diagnosis theory and technology on combustion.

b. Combustion chemistry and kinetics.

c. Combustion reaction control.

d. Theory and technology of combustion pollutants control.

e. Combustion theory and technology of aero-engine.

f. Utilization of solid waste resources.

g. CO2 capture and utilization of low carbon energy.

(4) Detonation propulsion technology.

a. Continuous rotating detonation engine technology.

b. Continuous detonation turbine-combined engine technology.

c. Solid powder fuel detonation engine technology.

d. Integrated design technology of continuous detonation engine and aircraft.

(5) Renewable energy technology.

a. Solar photovoltaics.

b. Hybrid solar photovoltaic/thermal technology.

c. Biomass energy conversion technology.

d. Reliability of wind turbines and its diagnosis.

e. Hydrogen energy and fuel cells.

**3. Duration of studies**

Full time PhD students are expected to complete their studies and earn their degrees in 4 to 6 years, and they will be disqualified from the program after 6 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**

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| --- | --- | --- | --- |
| **Course No.** | **Course Name** | **Semester** | **Credits** |
| ***I. Fundamental Courses*** | **4** |
| L371A002 | Chinese | Fall | 2 |
| L371A003 | Introduction to Chinese Classics | Fall | 2 |
| ***II. Core Courses*** | **8+** |
| L113A010 | Matrix Analysis and Computation | Spring | 3 |
| L113A008 | Stochastic Mathematics | Spring | 3 |
| L113A006 | Applied Partial Differential Equations | Spring | 3 |
| L113A007 | Numerical Analysis | Spring | 2 |
| ***III. Major Electives*** | **4+** |
| S108B001 | Advanced Engineering Thermodynamics | Fall | 3 |
| L108B003 | Advanced Combustion Theory | Spring | 3 |
| S108B003 | Advanced Heat Transfer | Fall | 3 |
| L108C009 | Computational Heat Transfer | Spring | 2 |
| L108C011 | Gas Turbine Combustion | Spring | 2 |
| L108C012 | Low Carbon Utilization of Energy | Fall | 2 |
| L108C013 | Evaluation Method of Energy System | Fall | 2 |
| L108C014 | Micro- and Nano-manufacturing: Applications and Challenges | Spring | 2 |
| ***IV. Thesis Credits*** |
| L0000003 | Dissertation Proposal II | Fall | **2** |
| L0000004 | Academic Activities II | Fall |
| **Total Credits Required** | **18+** |
| NOTE: (1) PhD students are required to attend academic conferences for at least twice before defending their theses. (2) PhD students are required to present their research at the PhD Student Forum for at least twice before defending their theses. (3) PhD students are required to submit annual report on their research. (4) PhD 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, 1/3 of which must be published in English and 1/3 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.

# Doctoral Program in Management Science & Engineering

**1. Introduction**

Management Science and Engineering is one of the major disciplines of Nanjing University of Science & Technology (NJUST), and offers both master and doctoral programs, and has a postdoctoral research center.

**2. Research Directions**

1. Quality management & quality engineering
2. Manufacturing operations & supply chain management
3. Information systems & knowledge management

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| --- | --- | --- | --- |
| **Course No.** | **Course Name** | **Semester** | **Credits** |
| ***I. Fundamental Courses*** | **4** |
| L371A002 | Chinese | Fall | 2 |
| L371A003 | Introduction to Chinese Classics | Fall | 2 |
| ***II. Core Courses*** | **8+** |
| L107B008 | Management Science & Systems Engineering | Fall | 3 |
| L107B009 | Advanced Statistical Methods | Fall | 3 |
| L107B010 | Game Theory | Spring | 3 |
| L107B011 | Optimization Theory & Methods | Spring | 3 |
| ***III. Major Electives*** | **6+** |
| L107C014 | Quality management & quality engineering research topics | Fall | 2 |
| L107C015 | Manufacturing operations & supply chain management research topics  | Fall | 2 |
| L107C016 | Information systems & knowledge management research topics | Fall | 2 |
| L107C017 | Management evaluation & decision analysis research topics | Spring | 2 |
| L107C018 | Industry development and innovation management research topics | Spring | 2 |
| ***IV. Thesis Credits*** |
| L0000003 | Dissertation Proposal II | Fall | **2** |
| L0000004 | Academic Activities II | Fall |
| **Total Credits Required** | **20+** |
| 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. |

1. Management evaluation & decision analysis
2. Industry development and innovation management

**3. Duration of studies**

Full time PhD students are expected to complete their studies and earn their degrees in 4 to 6 years, and they will be disqualified from the program after 6 years.

**4. Credits requirements**

Students are required to complete at least 20 degree credits from courses in Section 5 with a minimum of 18 coursework credits and 2 obligatory courses.

**5. Curriculum**

**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 "***NJUST 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 "***NJUST 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.