

English Master Program in Electrical Engineering

(Code for major: 0808 Degree granted: master of engineering)

I. Disciplinary subjects and research areas

Back in 1912, Beijing Railway Management Institute, the predecessor of Beijing Jiaotong University, set up “Class B of Advanced Electrical Engineering”; until now, the discipline of electrical engineering in BJTU has had a history of over one century.

In 2006, the discipline obtained the authority to grant the first-class discipline doctoral degree, and cultivated academic masters and doctoral students in five secondary disciplines: motor and electrical appliances, power system and automation, high voltage and insulation technology, power electronics and power transmission, electrical theory and new technology. Among them, power system and automation, power electronics and power transmission are provinces (ministries) Level key disciplines. After years of development, the discipline has formed a high-level teaching faculty composed of more than 50 doctoral supervisors and more than 100 master supervisors, and has built the National Energy Active Distribution Technology R & D Center, the Engineering Research Center of the Ministry of Education in Electric Traction, Beijing Rail Transit Electrical Engineering Technology Research Center, and the Active Distribution Microgrid Big Data Analysis and Processing Innovation and Talent Attraction base ("111" Talent introduction base) and other scientific research platforms. Based on the rail transit and power energy industries, this discipline focuses on the common basic theories and core key technologies of the industry, serves the national and industrial development strategies and major needs, and has distinctive characteristics. Graduates have the characteristics of solid basic theory, strong professional ability and high comprehensive quality, and the employment rate has been maintained at 100%. This discipline has cultivated a large number of industry leading talents for the society and has a good social reputation.

01 motors and appliances

Research interests include traction motor and its control, traction motor bearing and lubrication technology, intelligent electrical appliances, motor and electrical dynamic analysis, motor thermal analysis and electromagnetic field analysis, motor and electrical parameter test and identification, special motor and its control, energy storage technology and application, green rail transit, etc.

02 power system and its automation

Research interests include power system analysis, traction power supply system theory and technology, power system protection and control, integrated energy system, intelligent power distribution, new energy power generation and grid connection technology, electric vehicle charging technology, active distribution network and energy management technology, microgrid technology, power system power quality, power market and economic operation, Power safety technology and engineering, etc.02 电力系统及其自动化

03 high voltage and insulation technology

Research interests include power system overvoltage protection and insulation coordination, on-line monitoring and fault diagnosis of high-voltage electrical equipment, electromagnetic transient analysis, gas discharge theory and its application, etc.

04 power electronics and power transmission

Research interests include power electronic devices and systems, electric traction and transmission control, train network control technology, industrial special power supply, new energy power generation and grid connection technology, electric vehicle charging technology, rail transit electrical equipment, rail transit state detection and online monitoring, new sensors, sensor networks and the Internet of things, control network technology and its applications, Embedded real-time system, etc.

05 electrical theory and new technology

Research interests include superconducting technology and application, energy storage technology and application, power battery group application technology, electromagnetic field theory and application, nonlinear circuit and chaos theory and application, electromagnetic compatibility theory and technology, new electromagnetic measurement technology, etc.

II. Training objective

Cultivate innovative research talents and high-level specialized technical talents in electrical engineering discipline to meet the needs of China's national economic development and socialist construction and the all-round development of morality, intelligence, physique, beauty and labor. The master of Engineering in this discipline shall meet the following requirements:

1. Adhere to the party's basic line, support the leadership of the Communist Party of China, love the motherland, abide by discipline and law, have correct conduct, have a realistic and rigorous scientific style, have a strong dedication to work and the spirit of dedication to science, and actively serve the cause of modernization.

2. Master solid basic theory and systematic expertise in electrical engineering discipline, have strong knowledge acquisition ability and academic identification ability, and fully understand the current situation, development direction and international academic frontier of relevant research fields of this discipline.

3. Have the ability to engage in scientific research or independently undertake special technical work, have a rigorous, realistic and innovative scientific attitude and work style, and have strong writing ability and academic communication ability.

Graduates can engage in scientific research, teaching, technology development, engineering design, technology management and other work in scientific research institutes, universities and enterprises in the field of electrical engineering.

III. Training modes and schooling years

1. Training modes

(1) Drafting training plan

Within twomonths after postgraduates getting enrolled, the tutor is responsible for drafting the training plan in combination with research direction and scientific research project. The training plan shall clearly state the topic selection of thesis and provide requirements for curriculum provision, literature reading, scientific research and academic activity participating, practical training and academic thesis writing, and the progress plan shall also be provided. The training plan can only come into effect after getting approved by the corresponding dean of the school.

(2) Course study

Course study and scientific research can be done simultaneously. Credit system is adopted and all the required credits shall be completed before application for thesis defense.

(3) Thesis proposal

(4) Academic thesis writing

(5) Academic thesis defense

2. Schooling years

Basic schooling years is 3 years. If a graduate student cannot complete his studies within the specified academic system, he may apply for an extension of the length of study, which shall be subject to the regulations on the administration of graduate student status of Beijing Jiaotong University

IV. Scientific research and practice

Scientific research and practice is one of the most important ingredients of postgraduates training, which can train the postgraduates to think independently, to innovate, to get engaged in scientific research and to undertake special technique. Furthermore, the comprehensive professional competence of the postgraduates in systematic scientific research or specific practice can also be greatly improved. The postgraduates should spend at least 1 year on scientific research and practice during schooling years.

In the first schooling year, the postgraduates are required to actively participate in academic reports and read certain amount of literature; in addition, they are supposed to take part in research projects organized by the tutor in which their integrated skills will be increased. The postgraduates are also required to summarize literatures they have read, or present report reviews at academic exchanges.

From the second schooling year, the postgraduates are encouraged to present academic report on the basis of their research project in English. The postgraduates are also encouraged to take part in the college-enterprise cooperation training mode according to the actual requirements of the research project, in which the postgraduates' practical problem-solving ability will be trained and improved.

The postgraduates are encouraged to participate in those educational and practical activities concerning cultural quality and innovation ability. The postgraduates should, in combination with their academic theses, summarize the achievements from their scientific research.

Academic postgraduates should summarize and refine the achievements of scientific research and publish small academic papers in combination with their dissertation work.

VI. Academic thesis

Carrying out scientific research and writing dissertations is the main way to train Postgraduates' scientific research ability and cultivate their innovation ability. It is also one of the important basis to measure whether postgraduates can obtain degrees. Postgraduates are required to complete corresponding thesis links. The specific contents and requirements should be based on Based on the regulations of Beijing Jiaotong University on strengthening the quality monitoring of master's training process and improving the quality of degree thesis. The main links of the degree thesis include:

1. Thesis topic selection

The academic thesis, as the important basis whether or not the master degree will be granted, is the key step to train the postgraduates to grasp scientific research methods, to carry on scientific research by themselves and to solve the practical problems creatively. The topic selection of the thesis shall closely incorporated with the developing direction of the subject, in combination with the research project of the tutor or the practical demand of the engineering, the requirements of new viewpoint or insight presented in the thesis shall also be satisfied. The thesis topic can also be selected by the postgraduates themselves with the approval of their tutors.

2. Topic selection report

The master's program is generally organized by the College (discipline), and the latest distance from the date of application for defense is not less than half a year. The college organizes relevant experts to review the topic selection report and thesis work plan after listening to my topic selection report.

3. Thesis mid-term assessment

For academic postgraduates, the university implements a mid-term examination system for dissertations. The assessment time shall generally be arranged in the fourth semester. Half a year after the opening report is passed, you can participate in the mid-term assessment.

The main tasks of thesis mid-term assessment include: whether the thesis plan conforms to the topic selection report, and whether they proceed as schedule, reasons shall be stated if not; finished parts of the thesis or periodic achievements accomplished; problems encountered in thesis writing and proposed solving methods; following working plan; "research progress report on academic thesis" reflecting the above problems shall be submitted. The thesis mid-term assessment generally takes place at the end of the second schooling year, which will be evaluated by experts organized by the school.

4. Requirements of academic thesis and defense step

(1) Academic thesis

The master degree thesis, as the important factor to measure the postgraduates' quality, should be completed by the postgraduates themselves, under the tutor's guidance. The master degree thesis should contain systematic and integral basic theory and professional knowledge: ① basic theory; ② professional knowledge; ③ excellent writing skill.

(2) Defense

The thesis defense can only be applied one year after the thesis proposal. The defense of master degree thesis includes the following steps.

1) The defense application submitted by the postgraduates

The postgraduates can submit the defense application (generally one month prior to defense date, see the specific notice of the school) based on their own actual situation within the schooling year limitation

stipulated by the school, and the defense application should be confirmed with their tutor's signature.

2) Defense qualification approval

The qualification of postgraduates applying for thesis defense will be appraised by the school according to the training program, which includes: ① the credits required by the professional training program have been completed; ② the thesis proposal defense has been passed; ③ the thesis has been completed; ④ Publish small papers or obtain patent authorization to meet the requirements.

Only after getting the approval of the school and the passage of the defense qualification can the thesis be submitted for reviewing and prepared for defense.

3) Academic thesis submittal for reviewing

If the school draws lots to participate in the public defense, the two papers will be sent to other schools for review. If the students do not participate in the public defense, after the papers are handed in, the college will spot check one of the papers of some students and send it to other units for review. If the first author publishes one or more class a papers related to the content of the dissertation, the graduation thesis may not be subject to external review after being recognized.

4) Thesis achievement acceptance

Prior to thesis defense, the thesis achievement will be accepted by the defense experts organized by the school, those who failed the acceptance step will not be entitled to defending.

5) Thesis defense

It shall be implemented in accordance with ***“Detailed rules for the implementation of degree awarding of Beijing Jiaotong University***

VII. Curriculum and Credit Requirements

The minimum total credits that academic postgraduates should take in school are 33 credits, including 30 credits for courses and 3 credits for training links

Curriculum and credit requirements for academic Postgraduates

Course category	Course module	Course Code	Course Title	Credit	Semester	Credit Requirement	Remarks
Literacy improvement platform	Political literacy	A228001B	China Overview	2	Fall	2	
		A228002B	Chinese Culture	1	Spring	1	Chose 1 of 2
		A228003B	Modern Chinese Society	1	Fall&Spring		
	Comprehensive literacy course	A228004B	Cross cultural communication	1	Fall	2	
		A226001B	Information retrieval		Spring		
		A228005B	Innovation and Entrepreneurship		Spring		
Comprehensive literacy practice	H207008B	Comprehensive literacy practice	1		1	Note 1	
Capability improvement platform	Language competence module	C407001B	Master students' academic writing ability training	1	Spring	1	
		C428001B	Basi Chinese	3	Fall	3	Note 2
		C428002B	Advanced Chinese	3	Fall&Spring		
		C428003B	Business Chinese	3	Fall&Spring		
		C428004B	Advanced applied Chinese	3	Fall&Spring		
	Mathematical ability module	C308103B	Matrix Analysis	2	Spring	2	
	Information capability module	C402015B	Mobile Computing	2	Spring	2	
Professional further	Core courses of discipline	M507009B	Electric Network Theory	2	Fall	12	
		M507005B	Modern Power System Analysis	3	Fall		
		M507002B	Power Electronics Circuit and System	3	Fall		

education platform		M507038B	Renewable Energy Microgrid Systems	2	Fall	4	
		M507019B	Linear system theory	2	Spring		
	Professional development course	M507017B	Power Battery Application Techniques	2	Spring		
		M507006B	Electric Power System Automation	2	Spring		
		M507037B	Modeling and Control in Power System and Smart Grid Applications	2	Spring		
		M507044B	Three-phase Converters Topologies and Modulation Techniques	2	Fall		
		M507015B	Modern Power System Protection and Control	2	Fall		
			Excellent tutor courses				
			Corss Area Courses				No more than 2 undergraduate courses of other majors can be selected
		Other courses					
Professional repair		Undergraduate courses of this major, excluding credits			Note 3		
Academic and practical innovation platform	Regular academic meeting	H207001B	Regular academic meeting	1		3	
	Topic Selection Report	H207003B	Topic Selection Report	1			
	Thesis Midterm Assessment	H207004B	Thesis Midterm Assessment	1			

Note 1: Implemented and recognized by the Institute of international education

Note 2: Graduation language requirements for international graduate students taught in English is HSK 3 level 180 or above.

Note 3: As designated by the tutor or required by the college, a number of undergraduate courses of this major will be supplemented, and only grades will be counted, not credits.