**(080800)电气工程学科2020级全日制学术型硕士研究生培养方案**

2020 Full-time Academic Master Program for Electrical Engineering

**一、基本信息** Basic Information

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| **院系名称**  School | 电子信息与电气工程学院（电气系）  School of Electronic Information and Electrical Engineering  Department of Electrical Engineering | | | **适用年级**  Grade | 2020 级Class | |
| **适用专业**  Major | 电气工程  Electrical Engineering | | | **标准学制**  Duration | 2.5年Years | |
| **学习形式**  Study Mode | 全日制 Full time | | | | | |
| **项目类型**  Program Type | 学术型Academic | | | | | |
| **培养层次**  Program Level | 硕士生 Master Student | | | | | |
| **最低学分**  Min Credit | 28 | **最低GPA学分**  Min GPA Credit | 16 | **最低GPA**  Min GPA | | 2.7 |

**二、学科简介** Introduction

本学科始建于1908年，是上海交通大学历史最悠久的学科之一。1962年起下属五个二级学科陆续获得硕士学位授予权，在全国相应学科中均为首批有权授予硕士学位的学科。1999年设立电气工程学科博士后流动站。2000年电气工程获得一级学科博士学位授予权，培养电气工程学科的工学博士。本一级学科下属的电力系统及其自动化，电机与电器，高电压及绝缘技术，电力电子与电力传动和电工理论与新技术五个二级学科均开设了博士研究生课程，实行在一级学科范围内选课。

本学科研究与科技创新水平不断提高，拥有一系列重点科研与教育基地，包括“国家能源智能电网(上海)研发中心”，“国家能源海上风电技术装备研发中心”，“电力传输与功率变换控制教育部重点实验室”，“电气绝缘与热老化上海市重点实验室”，“国家工科基础课程电工电子教学基地”，“上海交通大学风力发电研究中心”和“上海交通大学泛在电力物联网智能感知实验室”等。

本学科与美国佐治亚理工、欧盟的意大利都灵理工大学和德国达姆施塔特技术大学开展了联合培养研究生的项目。毕业生主要分布在电力工程设计、电力电网、电气设备设计及制造、新能源等领域。

This discipline was founded in 1908, and is one of the oldest disciplines in Shanghai Jiao Tong University. Since 1962, 5 level-2 disciplines have successively had the right to confer a master’s degree, and have been listed into the first group of disciplines with the right to confer a master’s degree among national disciplines. A mobile post-doctoral station for electrical engineering was established in 1999. The electrical engineering discipline had the right to confer a doctoral level for level-1 discipline for the purpose of cultivating doctors majoring in electrical engineering in 2000. 5 level-2 disciplines classified into level-1 disciplines (including Power System and Automation, Electric Machines and Electric Apparatus, High Voltage and Insulation Technology, Power Electronics and Electrical Drives, and Theory and New Technology of Electrical Engineering) have opened doctoral student courses, and are selected within the scope of level-1 disciplines.

It also has research centers and labs such as “State Energy Smart Grid R&D Center”, “State Energy Offshore Wind Technology and Equipment R&D Center”, “Power Transmission Conversion and Control Key Lab of MOE”, “Electric Insulation and Thermal Aging Key Laboratory of Shanghai”, “Electric and Electronic Teaching Base of National Basic Science Courses”, “Wind Power Research Center” and “Ubiquitous Power IoT Intelligent Perception Lab”.

This discipline is now carrying out a joint program for training postgraduates with Georgia Institute of Technology of America, Turin Polytechnic University in EU, and Darmstadt Technical University of Germany. The postgraduates of this discipline are mainly distributed to the fields such as electric power engineering design, electric power and electric network, design and manufacture of electrical equipment, and new energy resources.

**三、培养目标** Program Objective

硕士学位获得者应能系统、深入地掌握电气工程领域的专业知识，了解本学科的现状、发展动态和国际学术研究的前沿。有一定的创新能力，能开展具有较高学术意义或工程应用价值的科研工作，并取得具有一定水平的成果。能较熟练地掌握一门外国语，具有一定的写作能力和进行国际交流的能力。

Students who have obtained master’s degree should have grasped systematically and in depth the professional knowledge on electric engineering, know the status, development trend and the frontier of international academic research of the discipline he/she studied. Such students should have been of certain capacity for innovation, able to conduct scientific research with high academic significance and value in engineering application, and have achieved some results at a certain level. Besides, such students should have relatively proficiently master a foreign language, been of certain capacities for writing and international communication.

**四、培养方式及学习年限** Training Mode and Study Duration

本项目采用全日制学习、导师制培养模式；新生入学后两周内经师生互选确定导师。学术型硕士学习年限一般为2.5年，最长不得超过3.5年。

Students pursue their studies in a full-time study load with supervisors’ instruction. Supervisors and students could choose each other within the first 2 weeks after freshmen registration. The study duration for academic master student is usually 2.5 years, no longer than 3.5 years in maximum.

**五、课程学习要求** Course Requirement

须修读完成总学分≥28，GPA统计源课程学分≥16。总学分内，数学类课程不低于6学分，专业前沿课与专业选修课各不低于3学分。GPA统计源课程内，包含学术英语2学分，专业基础课（不含数学类）不低于6学分，数学类课程不低于3学分。

The total credits are no less than 28. The GPA statistical source course credits are no less than 16. Within the total credits, the mathematics courses are no less than 6 credits, and the program frontier courses and program elective courses are no less than 3 credits respectively. The GPA statistical source courses includes academic English (2 credits), program core courses (mathematics excluded) no less than 6 credits and mathematics courses no less than 3 credits.

硕士生的课程学习原则上要求在第一学年内完成。各类课程具体要求如下：

The master's courses should be completed within the first academic year. The specific requirements are as follows:

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| **课程类别**  **Course Type** | **学分要求**  **Min Credits** | **门数要求**  **Min Courses** | **GPA 学分要求**  **Min GPA Credit** | **备注**  **Note** |
| 公共基础课 General Courses |  |  |  |  |
| 专业基础课 Program Core Courses |  |  |  |  |
| 专业前沿课 Program Frontier Courses | ≥3 |  |  |  |
| 专业选修课 Program Elective Courses | ≥3 |  |  |  |
| 任意选修课 Elective Courses |  |  |  | 非必需 Not required |

电气工程研究生学术报告会和讨论会要求：

1、学术报告会或讨论会，在个人培养计划中选在第二学期，全年都可以参加，入学第一年内完成。

2、参会后需提交由电气系举办的学术报告会记录表，硕士生要求提交6场学术报告会的记录表，每场总结不少于800字。电院相关学科的学术报告会也可参加，但不能超过总数的三分之一。

 3、所有选课学生于每年夏季学期第一周周三前以班级为单位，班长按二级学科方向分好收齐后将学术报告电子版反馈到教学秘书邮箱。每位学生的文件电子版反馈命名为：二级学科方向名称+姓名+学号，电气工程系五个二级学科方向为：电力系统、电力电子、电机、高压、电工中心。

电院报告会通知见网站http://www.seiee.sjtu.edu.cn/seiee/list/683-1-20.htm

电气系学术动态见网站<https://eei.sjtu.edu.cn/news.aspx?info_lb=498&flag=498>

Academic speech and seminar requirements:

1. Academic speech and seminar should be selected in the 2nd semester and can be participated in the whole year. They should be completed within the first academic year.
2. Postgraduate should submit at least 6 record forms after attending the academic speeches organized by the Department of Electrical Engineering. Each record form should include more than 800 words. The relevant subjects academic speeches organized by the Institute can also be participated, but they cannot exceed 1/3 of the total
3. All the postgraduates should submit the e-edition record form to their class leader before 1st Wednesday of the summer semester. Class leaders should classify the forms according to level-2 disciplines and send them to the teaching secretary.

Record form naming rules: level-2 disciplines name + postgraduates name + postgraduates ID

Level-2 disciplines names: Power System and Automation, Electric Machines and Electric Apparatus, High Voltage and Insulation Technology, Power Electronics and Electrical Drives, and Theory and New Technology of Electrical Engineering

Institute academic trends: <http://www.seiee.sjtu.edu.cn/seiee/list/683-1-20.htm>

Department academic trends: <https://eei.sjtu.edu.cn/news.aspx?info_lb=498&flag=498>

**六、培养过程要求** Training Requirement

硕士生学位论文开题工作一般应在第二学年第一学期结束前进行；

硕士生中期检查应在学位论文送审前3个月进行，基本要求：完成培养计划中规定的全部课程学习并成绩合格；GPA不低于2.7；学位论文开题已通过。

学位申请等其它事项具体参考：<http://yjwb.seiee.sjtu.edu.cn/yjwb/info/13602.htm>

Postgraduate’s thesis proposal should be initiated in the 3rd semester;

Postgraduate should go through intermediate assessment 3 months before they submit application for thesis evaluation. The basic requirements are: complete all courses with GPA≥2.7, pass thesis proposal.

SEIEE master students degree application progress: <http://yjwb.seiee.sjtu.edu.cn/yjwb/info/13602.htm>

**七、学术成果要求** Requirement on Academic Achievements

（1）硕士研究生在申请学位论文答辩之前，至少在如下范围的期刊或者会议上发表一篇与学位论文主要内容相关的学术论文：（a）电气工程系负面期刊列表（附件1）之外的EI,SCI国际期刊；（b）电气工程学科中文核心期刊，见附件2；（c）学科鼓励的会议，见附件3；（d）EI检索的国际会议;（e）被EI、SCI检索的大学学报。（附件1,2,3入学教育时由教学秘书提供）

（2）导师对学生发表论文的要求可以高于但不能低于（1）的要求。

（3）针对（1）中（c）和（d）会议论文的要求：对于学科鼓励的会议，会议召开时在学学生尽量参加，申请学位论文答辩时提交本人或论文共同作者注册、参会证明材料；对于EI检索的国际会议，全文必须在申请学位论文答辩时能够在EI上检索到，并提供检索证明；

（4）在学期间以上海交通大学学生名义取得的科研成果可等同学术论文的发表。获得国家级科技成果奖，可免除论文发表的要求；获得省部级科技成果一等奖的前8位、或二等奖的前5位、或三等奖的前2位、或获得发明专利授权，等同于发表SCI或EI论文；获得省部级科技成果奖，或获得发明专利公开，等同发表相同数量的核心学术论文。

（5）发表的学术论文必须以上海交通大学的名义署名发表，学位申请人为第一作者发表的论文以1篇计；以第二作者发表的论文（第一作者必须是其导师）以1/2篇计；第三作者及以后者不计。

（6）导师一作发表《中国电机工程学报》、《电工技术学报》、《电力系统自动化》及负面期刊列表之外的其他SCI杂志，且与学位论文主要内容相关的学术论文，学生为二作的以1篇记。

（7）对于所发表不在（1）的范围论文者，提交分学位委员会讨论。

(1) Before applying for the defense of the dissertation, the postgraduate shall publish at least one academic paper related to the main contents of the dissertation in the following journals or conferences: (a) EI, SCI International Journal except for the list of the negative journals of the Department of Electrical Engineering(Annexes 1); (b) Chinese Core Journal of electrical engineering discipline(Annexes 2); (c) conference encouraged by the Department of Electrical Engineering (Annexes 3); (d) International Conference indexed by EI; (E) University Journal indexed by EI and SCI. (Annexes 1~3 will be provided by the teaching secretary on the entrance education of freshman.)

(2) Tutors' requirements for students to publish papers can be higher than but not lower than (1).

(3) Requirements of conference papers of item (1) (c) and (d): Students should attend the conference encouraged by the department as much as possible，and they should submit their or co-author’s registration and participation certification materials when applying for thesis defense. For the International Conference of EI retrieval, the full text must be able to be retrieved on the EI before the application for thesis defense, and the retrieval certificate must be provided;

(4) The scientific research achievements obtained in the name of students of Shanghai Jiao Tong University during the semester can be equivalent to the publication of academic papers. Obtaining the national science and technology achievement award can exempt the requirement of paper publication; Obtaining the first eight of the provincial and ministerial science and technology achievement award, or the first five of the second prize, or the first two of the third prize, or obtaining the invention patent authorization, is equivalent to publishing SCI or EI papers; obtaining the provincial and ministerial science and technology achievement award, or obtaining the invention patent disclosure, is equivalent to publishing the same quantity of core academic papers.

(5) The published academic papers must be published in the name of Shanghai Jiao Tong University, and the papers published by the first author of the degree applicant shall be counted as 1 article; the papers published by the second author (the first author must be his supervisor) shall be counted as 1 / 2 article; the third author and the later shall not be counted.

(6) The tutor published one academic paper related to the main content of the dissertation including China Journal of Electrical Engineering, Journal of Electrical Technology, Power System Automation and other SCI journals except the ones in the negative journal list. The papers related to the dissertation published by the second author counted as 1 / 2 article.

(7) The papers published excluded in (1) would be submitted to the sub Degree Committee for discussion.

**八、学位论文** Thesis/dissertation work

硕士研究生应积极参与导师承担的科研项目，选择有重要应用价值的课题；通过学位论文研究生工作进行科学研究或承担专门技术工作的全面训练，培养创新能力，综合运用所学知识发现问题、分析问题和解决问题能力。硕士生学位论文要求详见：

《上海交通大学关于申请授予硕士学位（学术型）的规定》

《上海交通大学博士、硕士学位论文撰写指南》

Postgraduate students shall actively participate in the scientific research projects undertaken by their supervisor, selecting subjects with important application value; through conducting work related to academic dissertation, they should be comprehensively trained in carrying out scientific research or undertaking special technical work, so as to foster their innovation capacity, and the ability to comprehensively use what they learned to find, analyze and resolve problems. Please find the detailed requirements for paper publishing in:

Provisions of SJTU on Applying for Being Awarded Master's Degree (Academic Degree)

Guideline of SJTU for Writing Doctoral and Master Dissertation

**九、课程设置** Courses

详见下页 Please refer to the next page.

撰稿人签字： 日 期：

校稿人签字： 日 期：

审核人签字： 日 期：

主管院长签字： 院系公章 日期：

说明：

1. 培养方案制定完成并经院系学位委员会审核通过后，全日制请将本表格电子版(word)发送至jingliang@sjtu.edu.cn;
2. 请在新研究生教育管理信息系统完成新培养方案的申请，并在审核通过后将本表格的纸质版（签字盖章）送交研究生院存档。

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| **课程类别**  **Category** | **课程代码**  **Course Code** | **课程名称 Course Name** | | **学分**  **Credit** | **授课语言**  **Language\*** | **开课学期**  **Semester** | **可以计算GPA** | **必须计算GPA** | **备注 Note** |
| **中文Chinese** | **English 英文** |
| 公共基础课  General Courses | FL6001 | 学术英语 | English for Academic Purposes | 2 | 英文 in English | 春季 Spring | 是 Yes | 是 Yes | 必修 Compulsory |
| MARX6003 | 自然辩证法概论 | Dialectic of Nature | 1 | 中文 in Chinese | 秋季 Fall | 是 Yes | 是 Yes | 必修 Compulsory |
| GE6001 | 学术写作、规范与伦理 | Scientific Writing, Integrity and Ethics | 1 | 中文 in Chinese | 春秋季 Spring Fall | 否 No |  | 必修 Compulsory |
| MARX6001 | 中国特色社会主义理论和实践研究 | The Theory and Practice of Socialism in China | 2 | 中文 in Chinese | 秋季 Fall | 是 Yes | 是 Yes | 必修 Compulsory |
| 专业基础课  Program Core Courses | EE26009 | 电力电子系统建模与控制 | Modelling and Control for Power Electronics System | 2 | 英文 in English | 春季 Spring | 是 Yes |  |  |
| EE26014 | 逆变器理论与工程 | Inverter Theory and Engineering | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| F031506 | 电力系统规划 | Power System Planning | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| X031503 | 运动控制系统 | Motion Control System | 2 | 中文 in Chinese | 秋季 Fall | 是 Yes |  |  |
| X031505 | 电力系统安全分析 | Power System Security Analysis | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| X031506 | 电力系统可靠性 | Reliability of Power Systems | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| X031507 | 计算机继电保护导论 | Introduction to Computer Relaying Protection | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| X031508 | 现代控制理论 | Modern Control Theory | 3 | 中文 in Chinese | 秋季 Fall | 是 Yes |  |  |
| X031509 | 电气设备在线检测与状态维修 | Online Monitoring & Status Maintenance of Electric Power Equipment | 3 | 中文 in Chinese | 秋季 Fall | 是 Yes |  |  |
| X031510 | 工程电磁场数值计算 | Numerical Techniques in Electromagnetics | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| X031511 | 高电压数字测量技术 | High Voltage Digital Measurement Technology | 3 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| X031515 | 现代电机控制系统 | Modern Motor Control System | 3 | 中文 in Chinese | 秋季 Fall | 是 Yes |  |  |
| X031523 | 电力系统稳态分析 | power system static state analysis | 3 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| X031524 | 电能质量 | Quality of Power Supply | 2 | 中文 in Chinese | 秋季 Fall | 是 Yes |  |  |
| X031602 | 自适应控制 | Adaptive control | 3 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| X031604 | 电力系统暂态稳定 | Transient Stability of Power Systems | 2 | 中文 in Chinese | 秋季 Fall | 是 Yes |  |  |
| MATH6004 | 计算方法 | Numerical Analysis | 3 | 中英文并行开班 in both Chinese & English | 春秋季 Spring Fall | 是 Yes |  | 选课门数：3选2  最少选课学分：6  Min Courses: 2  Min Credits: 6 |
| MA26073 | 矩阵理论 | Matrix Theory | 3 | 中英文并行开班 in both Chinese & English | 春秋季 Spring Fall | 是 Yes |  |
| MATH6015 | 最优化方法 | Syllabus for Optimization Methods | 3 | 中英文并行开班 in both Chinese & English | 春秋季 Spring Fall | 是 Yes |  |
| 专业前沿课  Program Frontier Courses | EE26004 | 新能源电力变换与并网技术 | Power Convertor of Renewable Energy and its Integration with the Grid | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| EE26007 | 现代电力系统运行优化理论与应用 | Theory and Application of Optimization in Modern Power System Operation | 2 | 英文 in English | 秋季 Fall | 是 Yes |  |  |
| F031603 | 可再生能源发电系统 | Renewable Energy System for Electric Power Generation | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| F031604 | 超导材料与应用技术 | Applied Science of Superconductivity | 2 | 英文 in English | 春季 Spring | 是 Yes |  |  |
| GE6012 | 学术报告会或讨论会 | Academic Speech and Seminar | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  | 必修 Compulsory |
| X031504 | 电机专题 | Topics on Electric Machine | 2 | 中文 in Chinese | 秋季 Fall | 是 Yes |  |  |
| X031601 | 电力系统电磁兼容 | EMC in Electric Power Systems | 3 | 英文 in English | 秋季 Fall | 是 Yes |  |  |
| EE8012 | 电力大数据基础 | Basis of Big Data Analytics for Smart Grid | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| 专业选修课  Program Elective Courses | EE26008 | 多物理场耦合与有限元分析 | Multiphysics and FEM analysis | 2 | 英文 in English | 秋季 Fall | 是 Yes |  |  |
| F031507 | 电力电子技术在电力系统中的应用 | Power Electronics and Application in Power System | 2 | 中文 in Chinese | 秋季 Fall | 是 Yes |  |  |
| F031508 | 超高压输电线继电保护 | Relaying Protection for Extra-high Voltage Transmission Line | 2 | 中文 in Chinese | 秋季 Fall | 是 Yes |  |  |
| F031510 | 电力系统面向对象建模技术 | Object-Oriented Modeling Technology for Power Systems | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| F031512 | 数学在电力系统中的应用 | Application of Mathematics in Power System | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| F031513 | 灵活交流输电技术实验 | The Experimentations of FACTS | 2 | 英文 in English | 秋季 Fall | 是 Yes |  |  |
| F031514 | 电力市场导论 | Introduction to Power Market | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| F031524 | 电力装置及器件的电子保护技术 | Electronic Protective Principle of Electrical Equipments and Devices | 2 | 中文 in Chinese | 秋季 Fall | 是 Yes |  |  |
| F031525 | 现代电源技术 | Modern Power Source Technique | 2 | 英文 in English | 春季 Spring | 是 Yes |  |  |
| F031526 | 人工神经网络原理与应用 | Neural Network Principles and Application | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| F031534 | 电力传动调速控制综合实验 | Comprehensive Experiment of Electric Drive Speed Regulation and Control | 2 | 中文 in Chinese | 秋季 Fall | 是 Yes |  |  |
| F031537 | 现代电机设计 | Design of Modern Electric Machines | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| F031540 | 电力系统数字仿真软件应用 | Power Systems Digital Simulation - Software Application | 3 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| F031544 | 电站综合自动化系统 | Distribution Automation System | 2 | 中文 in Chinese | 春季 Spring | 是 Yes |  |  |
| F031546 | 电子系统综合设计 | Electrons System Design | 2 | 中文 in Chinese | 秋季 Fall | 是 Yes |  |  |
| 任意选修课  Elective Courses |  |  |  |  |  |  |  |  |  |