

巴黎卓越工程师学院能源动力（085800）2023 级全日制硕士研究生培养方案
SPEIT 2023 Full-time Master Program for Energy and Power Engineering

一、基本信息 Basic Information

院系名称 School	上海交通大学巴黎卓越工程师学院		适用年级 Grade	2023 级 Class	
适用专业 Major	能源动力		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	专业型 Professional				
培养层次 Program Level	硕士生 Master Student				
最低学分 Min Credit	55	最低 GPA 学分 Min GPA Credit	25	最低 GPA Min GPA	2.7

二、专业领域简介 Introduction

为了响应国家“卓越工程师教育培养计划”重大改革项目的号召，引进法国先进的工程师培养理念，为社会发展储备未来的精英工程师，上海交通大学于 2012 年与法国巴黎高科技工程师学校集团合作创办成立“上海交大-巴黎高科卓越工程师学院”。学院能源动力专业领域依托学校动力工程及工程热物理一级学科的发展优势与雄厚的教学资源，与巴黎国立高等电信学校 (Telecom Paris)、巴黎高科国立高等矿业学校 (Mines Paris)、巴黎综合理工学院(Ecole Polytechnique)与巴黎国立高等先进技术学校 (ENSTA Paris)，强强联合，共同设立并合作建设。

该专业研究能源的转换、储存和利用，为社会生活和工业生产提供动力，开设新能源、能效管理、能源数字化和智能化相关的课程，集前沿科学研究与工业应用为一体，是 21 世纪能源科技领域的主力专业。上海交通大学的能源动力专业归属国家重点一级学科动力工程及工程热物理 (A 类学科)，建有全国首批博士、硕士学位授予点，首批博士后流动站。

该专业的课程由法国四所合作高校的资深访问教授，上海交大的资深教师，以及来自中法企业界的资深专家组成。形成了教授面向低碳化和零碳化的相关能源知识体系的优质教学团队。主要研究领域围绕实现可持续发展的目标，包括传统能源的高效使用，清洁能源及可再生能源的开发，工业生产和企业运营的低碳化，能源利用的数字化和智能化等。

In 2012, in order to respond to the call of the major reform project of the national "excellent engineer education and training plan", to introduce the advanced French engineer training concept and to educate elite engineers for the social development, Shanghai Jiao Tong University (SJTU), in cooperation with ParisTech Group, established the STU-ParisTech Elite Institute of Technology. Relying on the development advantages and abundant teaching resources of Power Engineering and Engineering Thermophysics discipline of SJTU, this major is set jointly by SJTU and Telecom Paris, Mines Paris, Ecole Polytechnique and ENSTA Paris.

The major studies the energy conversion, storage, and utilization, providing all kinds of power

for social life and industrial production. It offers courses related to new energy, energy management and efficiency, energy digitization, and intelligent energy, integrating cutting-edge scientific research and industrial applications. It is in the key fields of energy technology in the 21st century. Energy power major in SJTU belongs to power engineering and engineering thermophysics disciplining at the national level key disciplines (A level), an, and it is the one of the first programs for Doctor degree and master Degree as well as one of the first mobile stations for post-doctoral research.

The courses of this major are composed of senior visiting professors from four French partner schools, senior teachers from Shanghai Jiao Tong University, and senior experts from both the Chinese and French business enterprises. We have formed a high-quality teaching team that specializes in the knowledge system of energy related to low-carbon and zero carbonization. The main research areas revolve around achieving the goal of sustainable development, including the efficient usage of traditional energy, the development of clean and renewable energy, low-carbon industrial production and enterprise operation, digitization and intelligence of energy utilization, etc.

三、培养目标 Program Objective

基础教育阶段：扎实的数理化基础； 工程师阶段，学习初期着重能源动力专业知识，培养能力和素质。课程包括动力、能源和环境等多学科，着眼于培养学生：

1. 掌握丰富而扎实的能源与动力工程领域基础理论；
2. 在此基础上通过设置大量实践与实习课程，重在培养和提高学生对专业知识的运用能力；
3. 通过与法国顶尖工程师学校联合开设的国际化教育课程，学生得以深入了解该领域的国际前沿技术及未来发展新动向。
4. 在专业课程之外，配合经管类与人文类课程、英语与法语等语言类课程，以及提供国外交流与企业实习机会等，多方位培养学生扎实专业创新能力、国际化视野与优秀沟通管理能力，使学生成为未来的卓越工程精英。

Fundamental cycle aims to make students have solid foundations in math, physics and chemistry etc. In engineering cycle, students will be taught energy and power major knowledge to cultivate ability and quality in the primary studying period. Curriculum includes energy, power, environment and other subjects, which enable students to:

1. Acquire abundant and foundational basic theory in energy and power engineering field;
2. Based on that lots of practice and internships are provided in order to cultivate and improve students' application ability;
3. International educational curriculum cooperated with top French engineer schools could assist students to have a deeper understanding of frontier technology, development trend and latest application of this field in the world.;
4. Apart from specialized courses, various other kinds of courses are provided, such as financial and management courses, humanity courses as well as English and French language courses; moreover,

the exchange and internship chances in China and abroad are provided to all students. All these multi-functional training ways could help students to have a strong capability in innovation with broad international horizon and excellent management ability, and become an outstanding engineer in future.

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

本项目在依托中法双方优势学科以及双方师资力量基础上，融合创新双方对人才培养的要求，采用全日制学习，学习年限为 2.5 年，最长不超过 3.5 年。

Based on the advantages of both SJTU and French partner schools in teaching team as well as the disciplines, this program integrates the requirements of both sides on talent cultivation and adopts full-time learning. The study period is 2.5 years, but no longer than 3.5 years.

五、课程学习要求 Course Requirement

须修读完成不少于 55.5 学分，其中 GPA 学分不少于 25，GPA 不低于 2.7。各类课程具体要求如下：

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	15		7	
专业基础课 Program Core Courses	40		18	数学至少选4学分计入GPA；允许跨学院选修2门导师推荐的课程。
专业前沿课 Program Frontier Courses				
专业选修课 Program Elective Courses				
任意选修课 Elective Courses				非必需

六、培养过程要求 Training Requirement

1. 第 1-3 学期学生基本完成课程学习；
2. 第 3 学期末进行开题报告；
3. 第 4 学期末进行中期检查；
4. 第 5 学期末进行论文答辩；
5. 第 5 学期学生需要在企业或科研机构内完成一个 24 周的全职工程师实习，提交实习

报告，完成汇报答辩，对应 24 个学分。

1. From semester 1-3, course study will be finished;
2. By the end of semester 3, thesis proposal will be organized;
3. By the end of semester 4, mid-term evaluation will be made;
4. By the end of semester 5, thesis defense will be taken;
5. During semester 5, students need to do a 24-week full-time engineer internship in companies or research institute, submit an internship report and pass the presentation, which is corresponding to 24 credits.

七、学术成果要求 Requirement on Academic Achievements

学生应积极参加校内外导师承担的科研项目，结合硕士学位论文工作或工程师实习要求，选择有重要应用价值的课题进行科学技术研究或承担专门技术工作的综合训练，全面培养创新能力、研究能力、实践能力以及学术研究素养。在项目执行过程中，鼓励学生积极探索并形成一定的研究成果，在申请学位论文之前，须完成 1 篇或 1 项论文发表、专利授权、软件著作权登记或技术报告等。详细要求请参考学院相关管理规定。

In order to improve ones' overall ability on innovation, research, practice and academics, students are suggested to take part in research projects under supervision of SJTU and industry tutors. It is recommended that students choose to conduct scientific and technological research with some important application values or to undertake comprehensive training on specialized technical work. During this research, students are encouraged to make active exploration and obtain some research achievements. At least one of the following requirements needs to be accomplished before being eligible for master thesis: 1 academic paper, 1 patent granted, 1 software copyright registration or 1 technical report. Please refer to the relevant regulations of SPEIT for detailed requirements.

八、学位论文 Thesis/dissertation work

学院鼓励学生在企业结合实习研究项目完成学位论文，学位论文选题应具有一定的与专业相关的工程背景与理论研究深度，拟解决的问题要有一定的创新性、技术难度与实际应用价值，最终论文能反映工作成果的实用性与创新性。

学位论文根据其研究成果的内容，可以为先进技术与方法、产品研发、工程设计、应用研究、工程/项目管理等，此外论文研究成果以及内容必须遵守学术道德与诚信原则，撰写格式要符合上海交通大学硕士学位论文撰写规范。

学生通过论文中期检查，完成论文并通过导师审核，在第 5 学期第 15 周前提交终稿并进行论文评审；通过评审，可参加论文答辩，答辩分为小组答辩与大组答辩两轮，小组答辩时间一般在第 5 学期第 17-18 周进行，大组答辩为下个春季学期开学初。

The institute encourages students to complete their master thesis in combination with research projects of engineer internship in enterprises. The topics of thesis should have certain engineering background and theoretical research depth related to the major. The problems to be solved need to have certain innovation, technical difficulty and practical application value. The final thesis shall reflect the

practicability and innovation of the work achievements.

According to the contents of the research, the thesis is acceptable in several types, varying from advanced technology and method, product research and development, engineering design, application research to engineering / project management etc. ; in addition, the research achievements and contents of the thesis must comply with the principles of academic ethics and integrity, and the writing format shall conform to the master's thesis writing standard of Shanghai Jiao Tong University.

After students pass the mid-term evaluation, complete the thesis and get the permission by supervisors, usually their final thesis shall be reviewed before the 15th week of semester 5. Upon the pass of the review, students are permitted to attend the defense. The process consists of small group defense and big group defense. The defense time is generally 17-18 weeks of semester 5 and the beginning of the spring semester followed respectively.

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 SherryLi327@sjtu.edu.cn, 非全日制请将本表格电子版(word)发送至 jshen@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。

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 Credit: 15	MARX6001	新时代中国特色社会主义思想理论与实践	Theory and Practice of Socialism with Chinese Characteristics in the New Era	2.0	中文 in Chinese	春 秋 Spring/Fall	是 Yes	是 Yes	必修 Compulsory
	MARX6003	自然辩证法概论	Dialectics of Nature	1.0	中文 in Chinese	春 秋 Spring/Fall	是 Yes	是 Yes	必修 Compulsory
	FL6701P	第二外语	Second Language	2.0	其它语言 Other Language	春 秋 Spring/Fall	否 No	否 No	必修 Compulsory
	FL7802P	高级综合法语	Advanced Comprehensive French	2.0	其它语言 Other Language	春 秋 Spring/Fall	是 Yes	否 No	必修 Compulsory
	FL6001	学术英语	English for Academic Purposes	2.0	英文 in English	春 秋 Spring/Fall	是 Yes	是 Yes	必修 Compulsory
	GE6604P	工业与信息设计	Industrial and Information Design	2.0	中文 in Chinese	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective
	GE6606P	人力资源管理 与中法跨文化管理	Human Resource Management and Multicultural Management (France-China)	1.0	其它语言 Other Language	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective
	GE6611P	文化市场与营销管理	Cultural Marketing Management	2.0	中文 in Chinese	秋 Fall	是 Yes	否 No	选修 Selective
	GE6612P	商业模式创新	Business Model Innovation	2.0	中文 in Chinese	春 Spring	是 Yes	否 No	选修 Selective
	GE6613P	经济决策与核算	Economic decision and calculation	1.0	其它语言 Other Language	春 Spring	是 Yes	否 No	选修 Selective
	GE6614P	重大工程管理与工业软件	Major Project Management and Industrial Software	2.0	中文 in Chinese	秋 Fall	是 Yes	否 No	选修 Selective 工业软件方向必修
	GE6609P	风险管理	Introduction to Risk Management	1.0	其它语言 Other Language	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective
	GE6610P	国际商法与合规	International Trade Law and Compliance	1.0	其它语言 Other Language	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective
专业基础课 Program Core Courses 数学模块至少选 4 学分计入 GPA	MATH6303P	随机方法	Stochastic Methods	2.0	其它语言 Other Language	春 Spring	是 Yes	否 No	选修 Selective 工业软件方向必修
	MATH6304P	最优化和数值分析	Optimization and Numerical Analysis	2.0	其它语言 Other Language	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective 工业软件方向必修
	MATH6306P	统计应用	Statistics in Action	2.0	其它语言 Other Language	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective 工业软件方向必修
	MATH6307P	自动化与系统控制	Automation and System Control	2.0	其它语言 Other Language	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective

	MATH6302P	有限元方法	Finite Element Method	2.0	其它语言 Language	Other	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective
	MATH6305P	运筹学	Operational Research	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	MATH6310P	深度学习	Deep Learning	2.0	其它语言 Language	Other	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective
	MATH6309P	编码原理	Coding Theory	2.0	其它语言 Language	Other	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective
专业选修课 Program Elective Courses	GE6615P	国之重器：工程概论	Mega Projects of China : Introduction to Engineering	2.0	中文 in Chinese		春 秋 Spring/Fall	是 Yes	否 No	选修 Selective 工业软件方向必修
	ICE6418P	高性能计算、算法与应用	High Performance Computing, Algorithm and Application	2.0	中文 in Chinese		春 秋 Spring/Fall	是 Yes	否 No	选修 Selective 工业软件方向必修
	ICE6410P	软件工程	Software Engineering	2.0	其它语言 Language	Other	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective 工业软件方向必修
	PE6312P	能源系统与集成	Energy Systems Modeling and Integration	2.0	其它语言 Language	Other	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective 工业软件方向必修
	PE7507P	发动机	Engine	2.0	其它语言 Language	Other	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective 工业软件方向必修
	PE7505P	碳捕获再利用与封存	Carbon Capture, Utilization and Storage	2.0	其它语言 Language	Other	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective 工业软件方向必修
	PE6310P	工业传热学	Industrial thermal transfers	2.0	其它语言 Language	Other	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective 工业软件方向必修
	PE7506P	能源管理与效率	Energy management and Energy efficiency	2.0	其它语言 Language	Other	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective 工业软件方向必修
	PE6408P	蓄能技术与氢能	Energy storage and hydrogen network	2.0	其它语言 Language	Other	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective 工业软件方向必修
	PE6901P	实践项目(1)	Application project I	2.0	其它语言 Language	Other	春 秋 Spring/Fall	否 No	否 No	选修 Selective 工业软件方向必修
	PE6409P	面向工程的科学机器学习	Scientific Machine Learning for Engineering	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	PE6313P	流体热力学	Fluid of Thermodynamics	2.0	其它语言 Language	Other	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective
	PE6309P	计算流体力学	Numerical modelling of fluid mechanics	2.0	其它语言 Language	Other	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective
	PE6407P	能源网络与动力系统	Electrical engineering and networks: Introduction to power systems	2.0	其它语言 Language	Other	春 秋 Spring/Fall	是 Yes	否 No	选修 Selective
	PE6902P	实践项目(2)	Application project II	2.0	其它语言 Language	Other	春 秋 Spring/Fall	否 No	否 No	选修 Selective
	PE6307P	燃烧产物和应用	Combustion Products and Applications	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective

	PE6402P	工业过程建模	Industrial Process Modeling	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	ME6302P	材料结构与计算	Structure calculation	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	ME6301P	机电一体化	Mechatronics	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	PE6401P	能源网络基础设施	Regulation of network infrastructure	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	ME6303P	流固耦合方法	Fluid-structure interaction	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	PE6303P	非稳与湍流	Instability and turbulence	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	PE6304P	过程工程	Process engineering	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	PE6305P	能源与环境	Energy and Environment	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	PE6308P	核技术及应用	Nuclear Technology	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	PE6403P	核反应堆安全分析	Nuclear Safety Analysis	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	PE6404P	先进核能系统	Advanced Nuclear Systems	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	PE6405P	环境管理	Environmental management	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	PE6406P	电厂机械设备	Power Plant Equipments	2.0	其它语言 Language	Other	秋 Fall	是 Yes	否 No	选修 Selective
	ME6401P	固体与结构数值模拟	Numerical Modeling of Solids and Structures	2.0	其它语言 Language	Other	秋 Fall	否 No	否 No	选修 Selective
	ME6309P	可压缩空气动力学	Compressible Aerodynamics	2.0	其它语言 Language	Other	秋 Fall	否 No	否 No	选修 Selective
	ME6307P	结构动力学	Structure Dynamics	2.0	其它语言 Language	Other	秋 Fall	否 No	否 No	选修 Selective
	ME6305P	疲劳断裂力学	Fatigue, Fissuration, Durability	2.0	其它语言 Language	Other	秋 Fall	否 No	否 No	选修 Selective
	ME6403P	智能材料	Smart Materials	2.0	其它语言 Language	Other	秋 Fall	否 No	否 No	选修 Selective
	ICE6408P	电子技术	Electronics	2.0	其它语言 Language	Other	秋 Fall	否 No	否 No	选修 Selective
										工业软件方向跨学科选修模块，最多选2门

										允许跨学院选修 2 门导师推荐的课程
专业前沿课 Program Frontier Courses	GE6001	学术写作、规范和伦理	Academic Writing, Norms and Ethics	1.0	其它语言 Other Language	春 秋 Spring/Fall	否 No	否 No	否 No	必修 Compulsory
	GE6011	学术报告会	Academic Lectures	1.0	其它语言 Other Language	春 秋 Spring/Fall	否 No	否 No	否 No	必修 Compulsory
	GE6003	实验室安全教育	Laboratory Safety Education	0.5	其它语言 Other Language	春 秋 Spring/Fall	否 No	否 No	否 No	进实验室必修 工业软件方向必修
	GE7901P	工业软件综合实践项目	Industrial Software Comprehensive Practice Project	8.0	中文 in Chinese	秋 Fall	否 No	否 No	否 No	工业软件方向必修
	PE7901P	能源动力前沿项目 1	Advanced EPE Project 1	4.0	其它语言 Other Language	秋 Fall	否 No	否 No	否 No	非工业软件方向 3 选 2, Select 2 from 3
	PE7902P	能源动力前沿项目 2	Advanced EPE Project 2	4.0	其它语言 Other Language	秋 Fall	否 No	否 No	否 No	
	PE7903P	能源动力前沿项目 3	Advanced EPE Project 3	4.0	其它语言 Other Language	秋 Fall	否 No	否 No	否 No	