南方科技大学
学术型博士研究生培养方案

SUSTech
Doctoral Program (Research Degree) for International Students

一级学科名称	材料科学与工程
Name of the First-level Discipline	Materials Science and Engineering
二级学科名称	
Name of the Second-level Discipline	
一级学科代码	0805
Code of the First-level Discipline	
二级学科代码	
Code of the Second-level Discipline	

适用于 2024 级

This PhD Program applies to the international doctoral students admitted in 2024

2024 年　月　日

一、培养目标 Program Objectives

1、遵纪守法，身心健康；具有良好的道德品质和学术修养，具有创新意识、学术精神和社会责任感；Observe discipline and law; be physically and mentally healthy; have good morality and academic attainment; hold the awareness of innovation, academic spirit and social responsibility;

2、精通材料科学与工程学科的基础理论知识和实验技能，掌握材料科学与工程及其交叉学科的发展现状及研究前沿；Proficient in the fundamental theoretical knowledge and practical skills of the Materials Science and Engineering discipline, and mastering the current development status and research frontiers of Materials Science and Engineering and its interdisciplinary field.

3、具备良好的科学素养，拥有较强的创新意识、国际视野、发现和解决科学问题的能力，能够独立思考并开展基础和应用研究；Having a good scientific literacy, strong innovative awareness, international perspective, and the ability to discover and solve scientific problems, being capable of independent thinking and conducting basic and applied research.

二、主要学科方向 Major Research Areas

序号 No.	学科方向 Research Areas	主要研究方向 Main Research Focus
1	新能源材料与器件 New Energy Materials and Devices	（1）能量捕获材料与器件； （2）电化学能源存储、转化与循环利用；. （3）光/电催化材料； （4）环境友好材料。 （1）Energy Capture Materials and Devices; （2）Storage, Conversion and Recycling of Electrochemical Energy; （3）Photo/Electrocatalytic Materials; （4）Environmentally Friendly Materials.
2	信息材料与器件 Information Materials and Devices	（1）半导体材料与器件； （2）柔性电子材料与器件；. （3）功能氧化物材料与器件；. （4）量子拓扑材料与结构； （5）传感材料与器件. (1) Semiconductor Materials and Devices； (2) Flexible Electronic Materials and Devices (3) Functional Oxide Materials and

		Devices (4) Quantum Topological Materials and Structures (5) Sensing Materials and Devices
3	材料先进加工与制造 Advanced Processing and Manufacturing of Materials	（1）微纳加工技术和精密制造； （2）增材制造工艺和设备； （3）智能制造加工技术； （4）生物医学材料加工与制造。 （1）Micro/Nano Fabrication Technology and Precision Manufacturing （2）Additive Manufacturing Processes and Equipment （3）Intelligent Manufacturing Processing Technology (4) Biomedical Materials Processing and Manufacturing
4	材料学 Materials Science	（1）材料基因工程与计算材料学； （2）先进材料表征方法与技术； （3）生物医学材料； （4）结构材料、智能材料、纳米材料和复合材料。 (1) Materials Genome Engineering and Computational Materials Science (2) Advanced Materials Characterization Methods and Techniques. (3) Biomedical Materials (4) Structural Materials, Smart Materials, Nanomaterials, and Composite Materials

三、学习年限 Program Duration

类型 Type of Students	基本学习年限 Normal Program Duration
硕士起点博士研究生 PhD students with a master’s degree	4 years

四、应修学分 Required Credits

课程类别 Course Type	学分 Credits

		普通博士（Ph.D.）
公共课 General Required Courses	英语课 English language courses	2
	中国汉语课 Chinese language courses	4
	中国概况课 Chinese cultural courses	2
	通识通修课 General research courses	2
专业课 Discipline-based courses		≥9(Core courses≥6)
学术活动 Seminar		2
劳动教育 Labor Education		1
开题报告 Doctoral dissertation opening report		1
中期考核 Mid-period assessment		1
最终学术报告 Final academic report		1
总计 Total		25

五、学术活动 Academic Activities

研究生应定期参加课题组的学术讨论会，博士生应参加不少于 16 次学术讲座。其中必听讲座包括科学道德与学风建设类讲座、实验室安全教育类讲座、心理健康教育与咨询类讲座和职业素养与规划类讲座各 1 次。满足学术活动要求后经培养单位审查通过，记 2 学分。

Graduate students should participate in the academic seminars of the research group regularly. PhD student should also attend at least 16 academic lectures, among which student should attend at least once for each category listed bellowed: lectures on scientific ethics and study style construction, laboratory safety education, mental health education and consultation, and professional quality and planning. After meeting the requirements of academic activities and reviewed and approved by cultivated department, 2 credits will be recorded.

六、劳动教育 Labor Education

劳动教育是中国特色社会主义教育制度的重要内容。研究生劳动教育应结合产业新业态、劳动新形态等新型生产劳动和服务型劳动，运用学科和专业知识开展实习实训、专业服务、社会实践、勤工助学、创新创业、志愿者服务等校外劳动锻炼活动，累计不少于 32 学时，完成后撰写劳动教育总结报告，经培养单位审查通过后记 1 学分。

Graduate labor education should combine new production labor and service-oriented labor such as new industrial formats and new forms of labor, and use discipline and professional knowledge to carry out off campus labor training activities such as internship and training, professional services, social practice, work study, innovation and entrepreneurship, volunteer services, with a total of not less than 32 credit hours. After completion, student shall write a labor education summary report, and record 1 credit after reviewed and approved by cultivated department.

七、开题报告 Doctoral Dissertation Proposal Assessment

内容：考核博士研究生所选课题的研究背景、研究计划及创新点、预期成果等。

Contents: Assess the research background, research plan, innovation points, and expected results etc. of the topic selected by the PhD student.

时间：应在第三学期结束前通过开题考核，通过后记 1 学分。

Time: The PhD student shall pass the Opening Report Assessment before the end of the third semester after entering the university; successfully pass should count as l credits.

方式：提交书面报告加答辩；

Mode: Submit a written report to attend the oral defense;

组织：考核的答辩环节总时长不少于 40 分钟。开题考核委员会由至少 5 名相关学科的博士研究生导师组成(可包括导师)，其中包含至少 1 名非本系专家，总人数为奇数。

Organizing: The duration of oral defense for PhD Dissertation Proposal Assessment shall be no shorter than 40 minutes. The Dissertation Proposal

Assessment Committee shall consist of at least 5 doctoral advisors in the related disciplines and the advisor may be included. Also includes at least 1 non-faculty expert, the total number of committee members shall be an odd number.

结果：考核结果设为通过和不通过。通过后记为 1 学分；未按时参加开题报告的，成绩记为“不通过”。第一次开题报告未通过的(包括未按时参加第一次开题报告的),应在 6 个月内进行第二次开题报告。第二次开题报告未通过的(包括未按时参加第二次开题报告的),予以结业或退学。

Result: The assessment results of dissertation proposal defense will be classified into "pass" or "fail". Upon passing the dissertation proposal defense, one academic credit will be granted. If a student fails to attend the dissertation proposal defense,the final grade will be recorded as "failed". For the first dissertation proposal defense, if students fail(including failing to attend on time), they should conduct a second defense within 6 months. If the second defense also fails (including failing to attend on time), the student will face the option of termination of the program or dismissal from the school.

*博士研究生学位论文的主要研究方向和研究内容有重大变动时，应重新进行开题考核。

* The PhD student shall attend a new Dissertation Proposal Assessment if the main research direction or research content of his/her dissertation has undergone major changes.

八、中期考核 Mid-period Assessment

内容：对已经开题的博士研究生就论文工作进展情况以及工作态度和精力投入等进行全面考察。

Contents: Assess the research background, research plan, innovation points, and expected results etc. of the topic selected by the PhD student.

时间：应在第五学期结束前完成。

Time: The PhD student shall pass the Opening Report Assessment before the end of the fifth semester after entering the university.

方式：书面报告和答辩。

Mode: Submit a written report to attend the oral defense。

组织：至少由 5 名相关学科的博士研究生导师组成(可包括导师)。

Organizing: The dissertation committee must consist of at least five doctoral

supervisors from relevant disciplines, which may include the student's own advisor.

结果：考核结果设为通过和不通过，考核通过记为 1 学分，未按时参加中期考核的，成绩记为“不通过”。第一次中期考核未通过的(包括未按时参加第一次中期考核的),应在 6 个月内进行第二次中期考核。第二次中期考核未通过的(包括未按时参加第二次中期考核的),予以结业或退学。

Result: The mid-period assessment result is divided into "pass" or "fail", and the successful completion is credited with one academic credit. If a student fails to attend the mid-period assessment on time, the final grade will be recorded as "failed". For the first mid-period assessment, if students fail(including failing to attend on time), they should conduct a second round of mid-period assessment within 6 months. If the second mid-period assessment also fails(including failing to attend on time), the student will face the option of termination of the program or dismissal from the school.

九、最终学术报告 Final Academic Report

在学位论文工作基本完成以后，最迟于正式申请答辩前 3 个月，每位博士生必须做一次论文工作总结报告，邀请不少于 5 名本学科或相关学科博士生导师组成评议委员会(评议委员会需要有至少 1 名培养单位学位评定分委员会委员参加),对论文工作的主要成果和创新性等进行评议，广泛听取意见。交叉学科的报告应在每个相关学科聘请至少一位专家参加。

最终学术报告通过后记 1 学分，博士研究生应根据委员会意见和建议对论文进行认真修改，经导师签字同意后方可提交学位论文送审。如果评议专家组认为论文工作量和创新性不符合博士学位论文的要求，则要至少 6 个月后重新进行最终学术报告。

After the dissertation work is basically completed, PhD student must make a summary report of the dissertation work at least three months before the formal defense. The final academic report is organized by each cultivated department, and no less than 5 doctoral mentors of the cultivated discipline or related disciplines are invited to form a evaluation committee. The evaluation committee needs to have at least one member of the degree evaluation sub-committee. The assessment committee will evaluate the main results and innovations of the dissertation work and solicit opinions. If the report spans multiple disciplines, at least one expert from each

relevant discipline should be hired to attend.

After the final academic report is passed, the PhD Dissertation can be submitted for examination, and 1 credit will be recorded. Based on the suggestions and opinions of the committee, the student should carefully revise the thesis and obtain the advisor's signature of approval before submitting for review. If the assessment committee determines that the volume and creativity of the dissertation work does not meet the requirements for a doctoral dissertation, the final academic report will be required to be done again after at least 6 months.

十、学位论文总体要求 General Requirements of PhD Dissertation

选题：具有重要科学意义价值

Topic Selection: The topic shall be of important scientific significance and value.

学术水平：1.具有独创性，由作者独立完成，立意明确。2、论文作者对本课题范围内的国内外发展动向、主要文献资料有较全面的了解和正确的评述。3、论文必须文句简练、通顺、数据可靠，图表清楚，严格准确地表达研究成果，实事求是的提出结论。4、论文对所学领域研究具有改进和创新的地方，具有一定学术价值。5、论文要有较高的学术水平和深度，表明作者已具备独立从事科学研究的能力。

Academic Level:1.With originality, it shall be independently completed by the author, with explicit conception. 2. The dissertation author has a relatively comprehensive understanding and correct review of domestic and foreign development trends and major literature on the selected topic. 3.The dissertation shall be concise, smooth, and reliable in data, with clear figures and tables, strictly and correctly expressing research achievements and truly presenting conclusions. 4.The dissertation has made certain improvement and innovation in the research of the studied field, with certain academic value. 5.The dissertation shall have reached a relatively high academic level and depth, proving that the author has the ability to independently carry out scientific research.

时间：博士研究生应在学校规定的期限内提交学位论文，在导师的指导下由博士研究生独立完成；

Time: The PhD student shall submit the PhD dissertation within the time limit

specified by the university, which shall be independently completed by the PhD student under the advisor's guidance;

语言：学位论文可采用中文、英文撰写，论文摘要和介绍部分要求用中英文双语书写，其中中文部分为 1000~2000 字，均以能将规定内容阐述清楚为原则；其他特殊情况可根据学校相关规定执行；

Language: The dissertation may be written in Chinese or English; the abstract and the introduction parts shall be written in both Chinese and English, of which the Chinese part shall consist of 1000 to 2000 words, clearly stating the specified contents; for any other special situation, refer to the relevant regulations of the School;

查重：原则上“去除本人已发表文献复制比”低于 5%,视为查重通过；复制比在 5%~10%之间，须填写说明，导师、系主任(或负责研究生工作的副系主任)签字确认同意后，视为通过；复制比高于等于 10%,视为不通过。

Plagiarism Check: In principle, the “ similarity rate with the author's own published literature deducted” shall be lower than 5%, which shall be deemed PASS in the check; if the similarity rate is between 5% and 10%, an explanation description must be submitted, and subject to the signature of the advisor and the dean of department (or the vice dean of department in charge of postgraduates)for approval, it shall then be deemed PASS; any check with a similarity rate higher than or equal to 10% shall be deemed FAIL.

十一、申请学位创新成果要求

Requirements for innovative achievements of degree application

研读期间，在材料科学与工程领域做出创新成果，对材料研发、理论模型建立、机理认识、计算和实验方法发展、或软件及仪器开发等方面做出重要贡献，或者所发表学术论文、授权发明专利体现出系统性和创新性，并经本学科学位分委员会审议通过。所发表学术成果第一作者及通讯作者的署名单位均为南方科技大学。

During their graduate study, students have made outstanding achievements in the field of materials science and engineering, demonstrating significant contributions in

material research and development, theoretical model establishment, understanding of mechanisms, computational and experimental method development, or software and instrument development. Alternatively, their published academic papers and granted invention patents should exhibit systematicness and innovation, upon review and approval by the degree subcommittee of the discipline. The authorship units of the first author and the corresponding author of the academic achievements published are both Southern University of Science and Technology.

十二、学位论文评审 PhD Dissertation Examination

时间：通过学位论文的形式审查和论文重合度检查后，可申请学位论文评审。

Time: The student may apply for PhD Dissertation Review after passing the formal examination and plagiarism check of the PhD dissertation.

方式：学位论文评审采用第三方平台至少两名匿名专家评审方式进行。

Mode: The evaluation of the dissertation shall be conducted through a third-party platform using at least two anonymous expert reviewers.

结果：参照《南方科技大学材料科学与工程学科研究生学位论文评审意见及处理规定》执行。

Outcome: The consequences shall be implemented in accordance with the 'Regulations on the Evaluation and Handling of Dissertation Reviews for Graduate Students in Materials Science and Engineering at Southern University of Science and Technology'.

十三、学位论文答辩 Oral Defense of PhD Dissertation

时间：博士研究生通过学位论文评审后，可申请学位论文答辩。

Time: After passing the dissertation evaluation, doctoral students may apply for their dissertation defense.

组织：学位论文答辩委员会由不少于 5 名（奇数，含至少 1 名一级学科学位评定分委员会成员）相关学科的博士研究生导师组成，其中校外专家不少于 2 人；答辩委员会主席一般由教授或具有相当职称的专家担任；导师可以担任

答辩委员，但不能担任答辩委员会主席。所有委员应具有博士研究生导师资格，其中至少半数应为教授或具有相当职称的专家。

Organization: The dissertation defense committee is composed of 5 doctoral advisors from relevant disciplines（Odd number, including at least 1 member of the first-level discipline degree evaluation sub-committee）, including at least 2 external experts. The chairman of the defense committee is typically appointed by a professor or an expert with equivalent professional titles. All members of the committee shall have the qualifications as doctoral supervisors, with at least half of them being professors or experts with equivalent professional titles. The advisor may serve as a member of the defense committee, but not as its chairman.

结果：答辩决议采取不记名投票方式，经全体成员三分之二或以上同意方可通过。学位论文答辩未通过者，可在学校规定时间内修改论文，经导师同意，重新申请答辩。

Results: The defense resolution is adopted through anonymous voting. It must receive affirmative votes from two-thirds or more of the committee members to pass. Doctoral students who do not pass the defense may modify their dissertation within the time limit stipulated by the university. Upon gaining approval from the advisor, they may reapply for the defense.

十四、其他说明

如属二级学科，请二级学科牵头单位负责人签署意见： 负责人签名： （签章） 2024 年　月　日
一级学科学位评定委员会意见： 经委员会表决，认为该培养方案符合材料科学与工程一级学科学术学位博士留学生培养要求，给与一致通过。 负责人签名： （签章） 2024 年 4 月 28 日
校学位评定委员会意见： 负责人签名： （签章） 2024 年　月　日

材料科学与工程学科 培养方案附录

Appendices to the Doctoral Program in

Materials Science and Engineering

附录一：课程设置 Appendix I：Courses

课程 类别 Course Type	课程代码 Course Code	课程名称 Course	开课学期 Semester	学分 Credits	周学时/ 总学时 Weekly Credit Hours/Total Credit Hours
公 共 课 General Required Courses	CLE033	中国文化 Introduction to Chinese Culture	春/秋 Spring	2	2/32
	CLE034	中国历史 Introduction to Chinese History	春/秋 Spring & Fall	2	2/32
	GGC5046	南科大研究生英语 SUSTech Post-graduate English	春/秋 Spring & Fall	2	2/32
	CLE7001	基础汉语 I Elementary Chinese I	秋 Fall	2	2/32
	CLE7002	基础汉语 II Elementary Chinese II	春 Spring	2	2/32
	GGC5009	科技论文写作（或其他写作类英文授课通修课） Literature Research and Academic Writing（or other general writing courses taught in English）	秋 Fall	2	2/32
公 共 选 修 课 General Required Courses （ Elective）	GGC5011	实验室安全学 Laboratory security	秋 Fall	1	1/16
	GGC5055	科学研究诚信与伦理	秋 Fall	1	1/16

专业课（ Courses(three at leasr）	专业核心课（Core Courses(two at leasr）	MSE5001	应用量子力学 Applied Quantum Mechanics	秋 Fall	3	3/48
		MSE5002	高等材料化学 Advanced Materials Chemistry	春 Spring	3	3/48
		MSE5003	材料力学行为 Mechanical Behaviours of Materials	春 Spring	3	3/48
		MSE5010	有机与生物材料 Organic and Biological Materials	春 Spring	3	3/48
		MSE5018	先进材料表征技术 Advanced Materials Characterization Techniques	春 Spring	3	3/48
		MSE5021	计算材料学 Computational Materials Science	春 Spring	3	3/48
		MSE5023	高等材料物理 Advanced Physics of Materials	秋 Fall	3	3/48
		MSE5024	高等热力学与动力学 Advanced Thermodynamics & Kinetics	春 Spring	3	3/48
		MSE5031	先进半导体材料 Advanced semiconductor materials	秋 Fall	3	3/48
		MSE5032	材料表面与界面 Materials Surface and Interface	春 Spring/秋 Fall	3	3/48
		MSE5038	能源材料原理 Principles of Energy Materials	秋 Fall	3	3/48
	专业选修课 Elective courses	MSE5004	纳米材料学 Introduction to nanomaterials	春 Spring	2	2/32
		MSE5013	先进电池材料 Advanced Battery Materials	春 Spring	3	3/48
		MSE5016	胶体与界面系统 Colloidal & Interfacial Systems	春 Spring	3	3/48
		MSE5019	光学材料与超构材料 Photonic materials and matematerials	春 Spring	3	3/48
		MSE5025	材料科学与人工智能 Materials Science and	秋 Fall	3	3/48

			Artificial Intelligence			
		MSE5026	先进光源导论 Introduction to advanced light source	秋 Fall	3	3/48
		MSE5027	材料科学中的有限元模拟 Finite Element Analysis for Materials Science	秋 Fall	3	3/48
		MSE5028	光子科学在材料研究和交叉前沿的应用 Photon science and its application to materials research and interdisciplinary frontiers	春 Spring	3	3/48
		MSE5029	声子学与热超结构材料 Phononics and Thermal Metamaterials	秋 Fall	3	3/48
		MSE5030	固体的磁性概论 Introduction to Magnetic Properties in Solids	秋 Fall	3	3/48
		MSE5033	晶体生长与表征导论 Introduction to Crystal Growth and Characterization	春 Spring	3	3/48
		MSE5035	量子材料与量子传感 Quantum Materials and Quantum Sensing (QMQS)	春 Spring	3	3/48
		MSE5036	封装材料与技术 Packaging Materials and Technology	秋 Fall	3	3/48
		MSE5037	超快光谱学基础 Fundamentals of Ultrafast Spectroscopy	春 Spring	3	3/48
		MSE5039	粉末冶金与增材制造 Powder Metallurgy and Additive Manufacturing	春 Spring	3	3/48
		MSE5040	现代材料分析测试实验 Modern Materials Analysis and Testing Experiments	春 Spring /秋 Fall	2	2/64
		MSE5041	二维电子材料及其电子器件应用 Two-dimensional materials for electronic device applications	秋 Fall	3	3/48
		MSE5042	柔性电子材料与器件 Flexible electronic materials	春 Spring	3	3/48

			and devices			
		MSE5043	信息存储材料与器件 Materials and Devices for Information Storage	秋 Fall	3	3/48
		MSE5044	先进原子力显微方法 Advanced Atomic Force Microscopy	秋 Fall	3	3/48

Note:

1. SUSTech Post-graduate English （南科大研究生英语）is the English language course for doctoral students.

2. Chinese Language Requirements:

Elementary Chinese I & II, totaling 4 course credits, are mandatory for international students. Both courses would help students develop an equivalent language ability of level-3 of Chinese Proficiency Test (HSK), which is required for graduation.

博士留学生的中文能力在毕业时应至少达到《国际汉语能力标准》三级水平（等同于 HSK 汉语水平考试三级）。完成《基础汉语 I&II》课程的留学生汉语综合运用能力可达到 HSK 三级。

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