

# 南方科技大学

## 学术学位硕士生培养方案

SUSTech

Academic graduate (Academic Degree) Requirements

一级学科名称

控制科学与工程

Name of the First-level Discipline

Control

Science

and

Engineering

一级学科代码

0811

Code of the First-level Discipline

0811

南方科技大学研究生院制

Issued by the Graduate School of Southern University of Science and Technology

2025 年 04 月 21 日

## 一、培养目标 Education Objectives

1. 以立德树人为根本，热爱祖国，遵纪守法，品德良好，学风严谨，有事业心和为科学献身的精神，愿为社会主义现代化建设服务。

Cultivate students to uphold moral integrity and nurturing of talents as the fundamental principle, candidates must demonstrate patriotism, legality, good moral character, rigorous academic conduct, a sense of mission, and the spirit of dedicating to scientific endeavors, with a commitment to serving the socialist modernization of China.

2. 掌握“控制科学与工程”学科领域坚实的基础理论和系统的专门知识，至少能熟练掌握一门外语；熟练掌握本学科的科研方法和技能，深入了解国内外本学科领域的新技术和发展动向。

Cultivate students to master the foundational theories and systematic specialized knowledge in the field of Control Science and Engineering, achieve proficiency in at least one foreign language, and thoroughly understand research methodologies, technical skills, and the latest technological developments both domestically and internationally in their discipline.

3. 具备从事科学研究、技术开发、辅助教学或独立担负本专业技术工作的能力，具有严谨求实的科学作风，具有良好的心理素质和健康体魄，具有创知、创新、创业精神。

Cultivate students to possess the ability to engage in scientific research, technology development, assist in teaching, or independently undertake professional technical work; demonstrate a rigorous and pragmatic scientific approach; maintain sound psychological resilience and physical health; and embody innovative thinking, creativity, and entrepreneurial spirit.

## 二、学科方向 Main research fields

1. 控制理论与控制工程。研究计算机控制、非线性系统控制、先进控制算法（自

适应控制、鲁棒控制）及智能优化技术，应用于智能制造、能源系统等领域。

Control Theory and Control Engineering. Focus on computer control, nonlinear system control, advanced control algorithms (adaptive control, robust control), and intelligent optimization techniques, with applications in smart manufacturing, energy systems, and related fields.

2. 模式识别与智能系统。研究计算机视觉（目标检测、工业质检）、智能决策（强化学习、动态规划）及 AI 驱动的自动化系统（智慧医疗设备、机器人控制）。

Pattern Recognition and Intelligent Systems. Focus on computer vision (object detection, industrial quality inspection), intelligent decision-making (reinforcement learning, dynamic programming), and AI-driven automation systems (smart medical devices, robotic control).

3. 导航、制导与控制。研究无人系统（无人机、无人车）的自主定位（SLAM、多传感器融合）、协同控制（集群决策、路径规划）及智能制导技术。

Navigation, Guidance, and Control. Focus on autonomous localization (SLAM, multi-sensor fusion), cooperative control (swarm decision-making, path planning) and intelligent guidance technologies for unmanned systems (UAVs, autonomous vehicles).

三、修业年限 Stipulated length of study

| 类型<br>Type                                    | 基本修业年限<br>Standard Length of Study | 最长修业年限<br>Maximum Length of Study |
|---|------------------------------------|-----------------------------------|
| 全日制硕士研究生<br>Full-time Master's Degree Program | 2-3 学年<br>2-3 Academic Years       | 3 学年<br>3 Academic Years          |

四、课程学习基本要求 Basic requirements for course study

1. 研究生应在培养方案规定的课程范围内修满规定学分。其他课程成绩录入成绩单，但不计入规定学分。

Graduate students should complete the required credits within the curriculum specified by the degree program. Though credits earned from other courses are recorded in the transcript, they are not counted as the required credits.

2. 学术学位研究生应在个人培养计划中修读至少一门论文写作指导类课程。

Academic-degree students should take at least one course on thesis writing guidance.

3. 汉语和中国概况类课程为接受学历教育国际研究生的必修课。

The Chinese language and the China overview courses are compulsory for international graduate students receiving curricula education.

| 课程性质<br>Course Type                  |   | 学分要求<br>Course Credits                              |
|--------------------------------------|---|---|
| 公共课<br>General Courses               | 思想政治理论课<br>Ideological and political theory courses | 3   |
|                                      | 英语课<br>English courses                              | 2   |
|                                      | 通识课<br>General education courses                    | 2   |
| 专业课<br>Specialized courses           |   | 14（专业必修课≥6）<br>14(compulsory specialized courses≥6) |
| 劳动教育<br>Labor education              |   | 1   |
| 学术研究训练<br>Academic research training | 学术交流<br>Academic exchange                           | 1   |
|                                      | 开题报告<br>The Proposal                                | 1   |
|                                      | 中期考核<br>Interim assessment                          | 1   |
|                                      | 总结报告<br>Summary report                              | 12  |
| 总学分<br>Total Credits                 |   | 37  |

## 五、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、科普活动、社会实践、创新创业、志愿者服务等校内外劳动锻炼活动，累计不少于 32 学时，填报劳动教育活动记录，经培养单位审查通过后记 1 学分。

Labor education is an important part of the socialist education system with Chinese characteristics. Labor education for graduate students should combine new production & service labor such as new industrial formats and new labor forms. During labor education, graduate students are supposed to use subjects' and professional knowledge to carry out internship, professional services, science popularization activities, social practice, innovation and entrepreneurship, volunteer services and other on- and off-campus labor education activities. Students should accumulate no less than 32 hours of labor education. Upon the completion of labor education, students should file in the Graduate Student Labor Education Record Form, and one (1) credit will be granted after review and approval by the educational unit of the labor education.

## 六、学术研究训练 Academic research training

学术学位研究生应完成学术研究训练。学术研究训练是学术学位研究生提升从事学术研究工作能力的重要环节，主要包括学术交流、开题报告、中期考核、总结报告等。

Academic graduate students should complete the academic research training. The academic research training represents a crucial element in the development of graduate students' capacity to engage in academic researches. It encompasses a range of activities, including academic exchanges, proposal, interim assessment, and summary report.

### （一）学术交流 Academic exchange

研究生应定期参加课题组的学术讨论会，硕士生应参加不少于 8 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。此外，研究生还应积极参加中国研究生创新实践系列大赛、国内外学术会议等，满足培养方案规定的学术交流活动要求后，经培养单位审查通过后记 1 学分。

Graduate students are required to regularly attend academic seminars organized by their research groups. Students are required to attend no fewer than 8 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. Additionally, students are encouraged to actively participate in the China Postgraduate Innovation & Practice Competitions, and Chinese and international academic conferences. After meeting the academic exchange activity requirements specified by the degree programs, and upon review and approval by the educational units, students will be granted with one (1) credits respectively.

## **(二) 开题报告 The proposal**

**内容：**研究生应在导师指导下确定学位论文的研究题目，制定论文工作计划，完成开题报告。开题报告应包括文献综述、选题背景及意义、研究内容、可行性分析、工作特色及难点、预期成果及可能的创新点等。开题报告需与学位论文语言类型保持一致，其他特殊情况可根据学校相关规定执行。

**Contents:** Graduate student should determine the research topic of his/her dissertation, formulate a work plan, and complete the proposal for his/her dissertation under the guidance of his/her supervisor. A proposal should include a literature review, the background of the topic selection and its significance, the research content, the characteristics and difficulties of the work, the expected results, and possible innovations, etc.

**时间：**硕士生应在第三学期结束前完成。

**Time:** The proposal should be completed before the third semester.

**方式：**书面报告加答辩。开题考核委员会至少由 3 名相关学科的硕士研究生导师

组成，其中至少包含 1 名非本系的相关专家，委员总人数为奇数，可包括导师。答辩秘书由获得相关学科博士学位人员担任。

**Method:** A written report combined with a defense session. The duration of oral defense shall be no shorter than 1 hour. The Dissertation Proposal Assessment Committee shall consist of at least 3 master's supervisors in the related disciplines, who shall include at least 1 related expert from outside the same department; the total number of committee members shall be odd, and the supervisor may be included; The secretary of the defense committee should have obtained a doctoral degree in a relevant discipline.

**结果:** 通过或不通过。考核决议采取不记名投票的方式，经全体成员三分之二或以上同意方可通过。考核通过的硕士研究生应根据考核意见修改开题报告。开题报告通过的，记 1 学分。第一次开题报告未通过的，可在 6 个月内再次开题报告，仍未通过的，予以分流。未按时参加开题报告的，成绩记为“未通过”。

**Result:** Pass or Fail. The result shall be determined through anonymous voting, requiring approval by two-thirds or more of all members. Students whose proposals are approved must revise their thesis proposals in accordance with the evaluation feedback. One (1) credit will be granted upon the successful completion of the proposal. Any graduate student who fails his/her proposal presentation should attend a second proposal presentation within six (6) months thereafter. Graduate students who fail their second proposal presentation will be diverted to a different program. Students will receive a grade of “fail” if they fail to attend the proposal presentation on schedule.

### **（三）中期考核 Interim assessment**

**内容:** 在学术研究训练过程中期，对已通过开题考核的研究生的综合能力、训练态度、精力投入、学位论文进展情况等方面进行检查。

**Content:** During the mid-term phase of the academic research training program, a comprehensive assessment will be conducted to evaluate students, who have passed proposal assessment, comprehensive competence, training diligence, effort investment, and



progress of the thesis.

**时间:** 硕士生应在第四学期结束前完成。

**Time:** The interim assessment should be completed before the fourth semester.

**方式:** 提交书面报告, 导师及培养单位审核。

**Method:** Written report, and reviewed and approved by the supervisor and department.

**结果:** 通过或不通过。中期考核通过的, 记 1 学分。第一次中期考核未通过的, 可在 6 个月内再次中期考核, 仍未通过的, 予以分流。未按时参加中期考核的, 成绩记为“未通过”。

**Result:** Pass or Fail. One (1) credit will be granted upon the successful completion of the interim assessment. Any graduate student who fails the first interim assessment should participate in a second interim assessment within six (6) months thereafter. Graduate students who fail the second interim assessment will be diverted to a different program. Students will receive a grade of “fail” if they fail to participate in the interim assessment on schedule.

#### (四) 总结报告 Summary report

在完成学术研究工作后、距正式答辩三个月前, 研究生应对学术研究训练进行总结, 并提交书面报告, 经导师同意、培养单位审查通过, 记 12 学分。未通过者应按照审查意见重新进行。

After completing the academic research work and three months prior to the official thesis defense, students must summarize their academic training and submit a written report. The summary must be approved by the supervisor and reviewed by the department. Upon successful approval, 12 credit hours will be awarded. Students who do not pass the review must revise their summary based on the feedback provided and resubmit for approval.

## 七、毕业(学位)论文工作要求 Requirements for Thesis (Dissertation)

(一) 学术学位研究生毕业(学位)论文是在导师指导下独立完成的、系统完



整的学术研究工作的总结，是评价研究生完成学术研究训练、具备学术研究工作能力并达到申请毕业（学位）条件的主要依据，应体现研究生达到了学业（学位）标准。

The thesis (dissertation) of an academic graduate student represents a comprehensive summary of his/her academic research work and is independently completed by the academic graduate student under the guidance of his/her supervisor. The thesis (dissertation) is the primary basis for evaluating whether an academic graduate student has completed the academic research training, possesses academic research capability, and is eligible for applying for graduation (degree). It should demonstrate that the academic graduate student has met the academic (degree) requirements.

（二）研究生应当按照学校相关规定撰写毕业（学位）论文。

Each graduate student should complete his/her thesis (dissertation) in accordance with the relevant regulations of the University.

## 八、毕业和学位授予 Graduation and Degree Conferral

研究生在学校规定修业年限内，完成培养方案规定内容（包括课程、训练和答辩），成绩合格，达到学校毕业要求的，依照《南方科技大学研究生毕业实施细则》（南科大研院发〔2025〕1号）规定的要求和程序申请毕业。通过毕业审核，学校准予毕业，并发给毕业证书。

Any graduate student who meets the requirements of his/her degree program (including courses, training, and oral defense) within the stipulated length of schooling with qualified scores may apply for graduation in accordance with *the Graduation Regulations on Postgraduate Programs of the Southern University of Science and Technology (SUSTech Graduate School (2025) No. 1)*. After the graduate student passes the graduation evaluation and meets the University's graduation requirements, the graduate student will be granted graduation and be issued with a diploma.

毕业生达到硕士学业要求、学术水平的，依照《南方科技大学学位管理实施办法》（南科大〔2024〕174号）、《控制科学与工程学术型硕士学位授予标准》相关规定授予学位。

Any graduate student who meets the doctoral academic requirements and academic standards may be awarded a degree in accordance with *the Implementation Measures for Degree Management in Southern University of Science and Technology (SUSTech (2024) No. 174)*, and *Award Criteria for the Academic Master Degree (PhD) in Control Science and Engineering etc.*

## 九、审核意见

经 控制科学与工程 学位评定分委员会审议，认为该培养方案符合 控制科学与工程 学科 硕士 研究生培养要求，审核通过。

Upon review by the Control Science and Engineering Academic Degree Evaluation Sub-Committee, it is deemed that the training program meets the cultivation requirements for master's students, and it has been approved.

负责人签名（签章）

日

期

Signature (Seal) of the Person in Charge:

Date:



## 0811 控制科学与工程 培养方案附录

### Appendices to the Master's Program in Control Science and Engineering

#### 附录一：公共课 Appendix I: General Courses

##### I 国内研究生公共课

##### I General Courses for Domestic Postgraduate Students

| 课程类别  | 课程代码  | 课程名称   | 开课学期                | 学分 | 学时 |
|---|---|--|---------------------|----|----|
| 思政理论课<br>Ideological and political theory courses | GGC5019   | 新时代中国特色社会主义理论与实践研究<br>Theory and Practice of Socialism with Chinese Characteristics in a New Era       | 秋/春<br>Fall& Spring | 2  | 32 |
|   | GGC5017   | 自然辩证法概论<br>Dialectics of nature  | 秋/春<br>Fall& Spring | 1  | 32 |
| 英语课<br>English courses                            | GGC5046   | 南科大研究生英语<br>SUSTech Post-graduate English  | 秋<br>Fall           | 2  | 32 |
| 通识选修课<br>General education courses                | GGC5047   | 高级学术写作与交流（或其他写作类通识课）<br>Advanced Academic Writing and Communication (or other English writing courses) | 春<br>Spring         | 2  | 32 |
|   | GGC5024   | 研究方法<br>Method of scientific research  | 春                   | 2  | 32 |
|   | *必修 1 门，可选修其他通识类课程，具体课程以系统内实际开设课程为准。<br>1 course is required, and students can optionally take other general education courses in the system. |  |                     |    |    |

##### II 国际研究生公共课

##### II General Courses for International Postgraduate Students

| 课程类别<br>Course Type   | 课程代码<br>Course Code | 课程名称<br>Course   | 开课学期<br>Semester | 学分<br>Credits | 学时<br>Credit Hours | 备注<br>Remarks   |
|---|---------------------|--|------------------|---------------|--------------------|---|
| 汉语和中国概况类课程<br>The Chinese language and the China Overview courses | CLE7001             | 基础汉语 I<br>Elementary Chinese I   | 秋 Fall           | 2             | 64                 | 国际研究生必选<br>International postgraduate students should take this course      |
|   | CLE7002             | 基础汉语 II<br>Elementary Chinese II   | 春 Spring         | 2             | 64                 |   |
|   | CLE033              | 中国文化<br>Introduction to Chinese Culture  | 秋 Fall           | 2             | 32                 | 国际研究生二选一<br>International postgraduate students can choose one from the two |
|   | CLE034              | 中国历史<br>Introduction to Chinese History  | 春 Spring         | 2             | 32                 |   |
| 通识必修课<br>general education courses                                | GGC5046             | 南科大研究生英语<br>SUSTech Post-graduate English  | 秋 Fall           | 2             | 32                 |   |
|   | GGC5047             | 高级学术写作与交流<br>Advanced Academic Writing and Communication<br>(or other English writing courses) | 春 Spring         | 2             | 32                 |   |

附录二：专业基础课列表 Appendix II: Professional basic theoretical courses

| 课程代码<br>Course Code | 课程名称<br>Course                                    | 开课学期<br>Semester | 学分<br>Credits | 学时<br>Credit Hours | 备注<br>Remarks     |
|---------------------|---|------------------|---------------|--------------------|-------------------|
| MEE5003             | 矩阵分析及其应用<br>Matrix Analysis and Its Applications  | 秋 Fall           | 3             | 48                 | 二选一<br>Select one |
| SDM5029             | 矩阵分析及其应用<br>Matrix Analysis and Applications      | 秋 Fall           | 3             | 48                 |                   |
| SDM5027             | 矩阵分析<br>Matrix Analysis                           | 春 Spring         | 3             | 48                 |                   |
| MAE5003             | 高等应用数学<br>Advanced Methods in Applied Mathematics | 春 Spring         | 3             | 48                 |                   |



|         |                                      |                        |   |    |  |
|---------|--------------------------------------|------------------------|---|----|--|
| MAE5002 | 高等数值分析<br>Advanced Numerical Methods | 秋/春<br>Fall&<br>Spring | 3 | 48 |  |
| MAT5002 | 数值分析<br>Numerical Analysis           | 秋/春<br>Fall&<br>Spring | 3 | 48 |  |
| EEE5062 | 计算方法<br>Computational Method         | 春 Spring               | 3 | 48 |  |

附录三：专业核心课列表 Appendix III: Professional core courses

| 课程代码<br>Course Code             | 课程名称<br>Course   | 开课学期<br>Semester | 学分<br>Credits | 学时<br>Credit Hours | 备注<br>Remarks     |
|---------------------------------|--|------------------|---------------|--------------------|-------------------|
| 学科方向 1<br>Research directions 1 | 控制理论与控制工程 Control Theory and Control Engineering         |                  |               |                    |                   |
| SDM5007                         | 工程优化方法<br>Engineering Optimization Methods               | 秋 Fall           | 3             | 48                 | 二选一<br>Select one |
| MEE5105                         | 工程优化基础<br>Fundamentals of Engineering Optimization       | 秋 Fall           | 3             | 48                 |                   |
| SDM5025                         | 线性系统<br>Linear Systems                                   | 春 Spring         | 3             | 48                 |                   |
| SDM5017                         | 非线性控制系统<br>Nonlinear Control Systems                     | 春 Spring         | 3             | 48                 |                   |
| SDM5006                         | 系统辨识与自适应控制<br>System Identification and Adaptive Control | 秋 Fall           | 3             | 48                 |                   |
| SDM5026                         | 鲁棒控制基础<br>Foundation of Robust Control                   | 春 Spring         | 2             | 32                 | 二选一<br>Select one |
| SDM5015                         | 鲁棒控制<br>Robust Control                                   | 春 Spring         | 3             | 48                 |                   |
| 学科方向 2<br>Research directions 2 | 模式识别与智能系统 Pattern Recognition and Intelligent Systems    |                  |               |                    |                   |
| SDM5013                         | 深度学习和强化学习<br>Deep Learning and Reinforcement Learning    | 春 Spring         | 2             | 32                 |                   |
| SDM5007                         | 工程优化方法<br>Engineering Optimization Methods               | 秋 Fall           | 3             | 48                 |                   |
| SDM5025                         | 线性系统<br>Linear Systems                                   | 春 Spring         | 3             | 48                 |                   |

|   |   |          |   |    |                   |
|---|---|----------|---|----|-------------------|
| MEE5114                                 | 高等机器人控制<br>Advanced Robotics Control                            | 春 Spring | 3 | 48 |                   |
| SDM5028                                 | 分布式优化与学习<br>Distributed Optimization and Learning               | 春 Spring | 3 | 48 |                   |
| CSE5022                                 | 高级多智能体系统<br>Advanced Multi Agent Systems                        | 秋 Fall   | 3 | 64 |                   |
| <b>学科方向 3<br/>Research directions 3</b> | <b>导航、制导与控制 Navigation, Guidance, and Control</b>               |          |   |    |                   |
| SDM5006                                 | 系统辨识与自适应控制<br>System Identification and Adaptive Control        | 秋 Fall   | 3 | 48 |                   |
| SDM5014                                 | 线性系统控制与估计理论<br>Control and Estimation Theory for Linear Systems | 春 Spring | 3 | 64 |                   |
| SDM5026                                 | 鲁棒控制基础<br>Foundation of Robust Control                          | 春 Spring | 2 | 32 | 二选一<br>Select one |
| SDM5015                                 | 鲁棒控制<br>Robust Control  | 春 Spring | 3 | 48 |                   |
| SDM5028                                 | 分布式优化与学习<br>Distributed Optimization and Learning               | 春 Spring | 3 | 48 |                   |
| EEE5046                                 | 现代信号处理<br>Modern signal processing                              | 秋 Fall   | 3 | 48 |                   |
| MEE5115                                 | 自主机器人系统<br>Autonomous Robotic Systems                           | 春 Spring | 3 | 48 |                   |

#### 修课说明:

\*专业必修课包括专业基础课及专业核心课，总学分需 $\geq 6$  学分；

\*在导师同意下，允许跨学科方向修读核心课；

\*在满足总学分要求的前提下，可以用专业核心课学分代替专业选修课学分。

#### Course Enrollment Guidelines:

\*Compulsory Specialized Course include Professional basic theoretical courses and Professional core courses, with total credit  $\geq 6$ .

\*With the consent of the supervisor, it is allowed to take core courses across research directions.

\*Under the condition of fulfilling the total credit requirement, students may use credits from Professional core course fulfill Elective course requirements.

#### 附录四：专业选修课列表 Appendix IV: Elective professional courses

| 课程代码    | 课程名称      | 开课学期     | 学分 | 学时 | 备注 |
|---------|-----------|----------|----|----|----|
| SDM5019 | 动态规划与随机控制 | 春 Spring | 3  | 48 |    |

|         |   |          |   |    |  |
|---------|---|----------|---|----|--|
|         | Dynamic Programming and Stochastic Control                                      |          |   |    |  |
| SDM5011 | 控制系统设计中的线性矩阵不等式<br>Linear matrix inequalities in control system design          | 秋 Fall   | 3 | 48 |  |
| SDM5008 | 高级机器人控制<br>Advanced Robotics Control  | 秋 Fall   | 3 | 48 |  |
| SDM5022 | 自适应动态规划<br>Adaptive Dynamic Programming   | 春 Spring | 1 | 16 |  |
| SDM5010 | 控制系统参数化设计<br>Parametric Control Systems Design                                  | 春 Spring | 3 | 48 |  |
| SDM5001 | 电子封装结构中的高分子材料失效行为<br>Failure Mechanisms of Polymers in Microelectronic Packages | 秋 Fall   | 3 | 64 |  |
| SDM5003 | 工程复合材料结构及功能化技术<br>Engineering Composite Structures and Functional Technology    | 秋 Fall   | 3 | 64 |  |
| SDM5004 | 产品可靠性设计与分析<br>Product Reliability Design and Analysis                           | 春 Spring | 3 | 48 |  |
| SDM5018 | 逻辑思维与人工智能<br>Logical Thinking and Artificial Intelligence                       | 春 Spring | 3 | 48 |  |
| CSE5001 | 高级人工智能<br>Advanced Artificial Intelligence                                      | 秋 Fall   | 3 | 64 |  |
| CSE5002 | 智能数据分析<br>Intelligent Data Analysis   | 春 Spring | 3 | 48 |  |
| CSE5003 | 高级算法设计与分析<br>Design and Analysis of Advanced Algorithms                         | 秋 Fall   | 3 | 64 |  |
| CSE5005 | 高级计算机网络<br>Advanced Computer Networks   | 秋 Fall   | 3 | 64 |  |
| CSE5010 | 无线网络与移动计算<br>Wireless Network and Mobile Computing                              | 秋 Fall   | 3 | 64 |  |

|         |  |          |   |    |  |
|---------|--|----------|---|----|--|
| CSE5012 | 演化计算及其应用<br>Evolutionary Computation<br>and Its Applications           | 春 Spring | 3 | 64 |  |
| CSE5014 | 密码学与网络安全<br>Cryptography and Network<br>Security                       | 春 Spring | 2 | 32 |  |
| CSE5018 | 高级优化算法<br>Advanced optimization<br>algorithms                          | 春 Spring | 3 | 64 |  |
| CSE5019 | 强化学习<br>Reinforcement Learning   | 秋 Fall   | 3 | 64 |  |
| CSE5020 | 高级分布式系统<br>Advanced Distributed<br>Systems                             | 秋 Fall   | 3 | 64 |  |
| CSE5021 | 软件分析<br>Software Analysis  | 春 Spring | 3 | 64 |  |
| CSE5023 | 深度学习前沿<br>Recent Advances in Deep<br>Learning                          | 春 Spring | 3 | 64 |  |
| CSE5024 | 高级数据库系统<br>Advanced Database System                                    | 春 Spring | 3 | 48 |  |
| CSE5025 | 组合优化<br>Portfolio Optimization and<br>Management                       | 秋 Fall   | 3 | 48 |  |
| CSE5026 | 认知科学基础与前沿<br>Fundamentals and Frontiers<br>of Cognitive Science        | 秋 Fall   | 3 | 64 |  |
| CSE5027 | 金融大数据与智能分析<br>Financial Big Data and<br>Intelligent Analysis           | 春 Spring | 3 | 64 |  |
| EEE5034 | 信号检测与估计<br>signal detection and<br>estimation                          | 秋 Fall   | 3 | 48 |  |
| EEE5051 | 电子科学与技术科学前沿<br>Advanced topics in electronic<br>science and technology | 秋 Fall   | 1 | 16 |  |
| EEE5053 | 高等固体物理<br>Advanced Solid State Physics                                 | 秋 Fall   | 3 | 48 |  |
| EEE5057 | 电子功能材料与元器件<br>Electronic functional<br>materials and devices           | 秋 Fall   | 3 | 48 |  |
| EEE5058 | 信息技术基础<br>Introduction to Information<br>Technology                    | 春 Spring | 3 | 48 |  |



|         |   |          |   |    |  |
|---------|---|----------|---|----|--|
| EEE5067 | 非线性电路与系统<br>Nonlinear Circuit and system  | 秋 Fall   | 3 | 48 |  |
| EEE5069 | 现代工程创新科技与管理<br>Innovation, Technology and<br>Management in Modern<br>Engineering    | 春 Spring | 3 | 48 |  |
| EEE5349 | 医疗机器人技术<br>Medical Robotics<br>Technology   | 春 Spring | 3 | 48 |  |
| EEE5346 | 移动机器人自主导航<br>Autonomous Robot<br>Navigation   | 春 Spring | 3 | 48 |  |
| EEE5021 | 高级非线性优化技术<br>Advanced Nonlinear<br>Optimization                                     | 秋 Fall   | 3 | 64 |  |
| EEE5049 | 高等电磁理论<br>Advanced Electromagnetic<br>Theory  | 秋 Fall   | 3 | 48 |  |
| EEE5065 | 计算电磁学<br>Computational<br>Electromagnetics  | 秋 Fall   | 4 | 48 |  |
| EEE5026 | 无线通信系统优化<br>Optimization of<br>Communication Systems                                | 春 Spring | 3 | 48 |  |
| MAE5008 | 连续介质力学 A<br>Continuum Mechanics A   | 秋 Fall   | 3 | 48 |  |
| MAE5009 | 连续介质力学 B<br>Continuum Mechanics B   | 秋 Fall   | 3 | 48 |  |
| MAE5029 | 高等实验力学<br>Advanced Experimental<br>Mechanics  | 秋 Fall   | 3 | 48 |  |
| MEE5103 | 行走机器人<br>Walking Robot  | 秋 Fall   | 3 | 48 |  |
| MEE5201 | 创新设计理论与应用<br>Innovation Design Theory<br>and Application                            | 春 Spring | 3 | 64 |  |
| MEE5205 | 断裂力学与失效分析<br>Failure Analysis and Fracture<br>Mechanics of Engineering<br>Materials | 秋 Fall   | 3 | 48 |  |
| MEE5304 | 复合制造技术前沿<br>Frontiers in Hybrid<br>Manufacturing Processes                          | 秋 Fall   | 3 | 48 |  |

|         |   |          |   |    |  |
|---------|---|----------|---|----|--|
| MEE5406 | 储能原理与技术<br>Principle and technology of<br>energy storage                                | 春 Spring | 3 | 48 |  |
| MEE5107 | 微加工与微系统<br>Microfabrication and<br>Microsystems   | 秋 Fall   | 3 | 48 |  |
| MEE5108 | 微型机器人<br>Microrobotics  | 春 Spring | 3 | 56 |  |
| MEE5111 | 先进机器人驱动技术<br>Advanced actuation for<br>robots   | 春 Spring | 3 | 64 |  |
| MEE5116 | 高等机构动力学<br>Advanced Kinematics and<br>Dynamics of Mechanisms                            | 秋 Fall   | 3 | 64 |  |
| MEE5117 | 机构与机器人中的旋量代<br>数与李群李代数<br>Screw Algebra, Lie Groups<br>and Lie Algebra in<br>Mechanisms | 春 Spring | 3 | 48 |  |
| MEE5301 | 先进制造基础<br>Fundamentals of Advanced<br>Manufacturing Technology                          | 秋 Fall   | 3 | 48 |  |
| PHY5036 | 前沿物理选讲 C<br>selected Topics in Frontier<br>Physics C                                    | 秋 Fall   | 3 | 48 |  |
| MAE8002 | 高等连续介质力学 A<br>Advanced Continuum<br>Mechanics A   | 春 Spring | 3 | 48 |  |
| MAE5002 | 高等数值分析<br>Advanced Numerical<br>Methods   | 春秋       | 3 | 48 |  |
| DES5001 | 工业应用与实践中的设计<br>创新<br>Design innovation in<br>industrial application and<br>practice     | 秋 Fall   | 3 | 48 |  |
| SME5008 | 先进微纳半导体器件物理<br>Advanced power electronics<br>and MEMS devices physics                   | 秋 Fall   | 3 | 48 |  |
| SME5017 | 微机电系统设计<br>MEMS design  | 春 Spring | 3 | 48 |  |
| SME5021 | 生物传感技术及应用<br>Biosensing Technology and<br>Applications                                  | 春 Spring | 3 | 48 |  |

|         |   |                    |   |    |  |
|---------|---|--------------------|---|----|--|
| SME5030 | 专利基础与撰写<br>Patent foundation and writing                  | 秋 Fall             | 1 | 16 |  |
| BME5012 | 人脑智能与机器智能<br>Brain Intelligence and<br>Machine Learning   | 秋 Fall             | 3 | 48 |  |
| BME5002 | 先进生物材料<br>Advanced Biomaterials                           | 秋 Fall             | 3 | 48 |  |
| STA5002 | 数理统计<br>Mathematical statistics                           | 春 Spring           | 3 | 48 |  |
| STA5007 | 高级自然语言处理<br>Advanced natural language<br>processing       | 秋 Fall             | 3 | 48 |  |
| PHY5034 | 现代物理实验 A<br>Experiments in Modern<br>Physics A            | 春 Spring           | 3 | 64 |  |
| PHY5011 | 物理学中的群论<br>Group Theory for Physicists                    | 秋 Fall             | 4 | 64 |  |
| MAE5011 | 力学前沿研究讲座<br>Seminars for Frontier in<br>Mechanics         | 秋 Fall             | 2 | 32 |  |
| BME5207 | 神经工程与智能传感<br>Neural engineering and smart<br>sensor       | 春 Spring           | 3 | 48 |  |
| MAT7099 | 金融数学专题<br>Topics in Financial<br>Mathematics              | 春 Spring           | 3 | 48 |  |
| MAT7081 | 矩阵计算<br>Matrix Computations                               | 春 Spring           | 3 | 48 |  |
| MAT8034 | 机器学习<br>Machine Learning                                  | 春 Spring           | 3 | 48 |  |
| FIN5016 | 金融计量经济学及应用<br>Financial Econometrics with<br>Application  | 春 Spring           | 3 | 48 |  |
| MAE8003 | 高等连续介质力学 B<br>Advanced Continuum<br>Mechanics B           | 春 Spring           | 3 | 48 |  |
| MAE8001 | 高等连续介质力学<br>Advanced Continuum<br>Mechanics               | 秋/春<br>Fall&Spring | 3 | 48 |  |
| INO5016 | 专利与知识产权保护<br>Patent & Intellectual Property<br>Protection | 秋/春<br>Fall&Spring | 3 | 48 |  |

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