

# 工业工程专业辅修学士学位培养方案

## Training Program for Minor Bachelor's Degree in Industrial Engineering

### 一、培养目标 Objectives

本专业面向现代工业及服务业，培养具备扎实的自然科学、工程科学基础，又掌握现代管理科学理论、工业工程专业方法与技能，具有良好的人文素养、职业素质、国际视野、创新精神和社会责任感，能够对工业与服务系统进行规划、设计、控制、评价、改进与创新，提高生产与服务系统效率，促进资源的有效利用，改善人们生活质量，推动经济发展和社会进步的工程与管理复合型专门人才。毕业后通过工作实践和继续学习，成为卓越的 IE 工程师、优秀的 IE 研究人员以及 IE 领域的拔尖人才。

This program is oriented towards modern industry and the service sector, aiming to cultivate individuals who possess a solid foundation in natural and engineering sciences, coupled with a grasp of modern management theory, industrial engineering methods, and skills. These individuals are expected to exhibit strong humanistic qualities, professional attributes, an international perspective, innovative thinking, and a sense of social responsibility. They should be capable of planning, designing, controlling, evaluating, improving, and innovating industrial and service systems, enhancing production and service efficiency, promoting efficient resource utilization, improving people's quality of life, and driving economic development and social progress. Graduates of this program, through practical work experience and ongoing learning, are expected to become exceptional IE Engineers, outstanding IE researchers, and top talents in the field of Industrial Engineering.

毕业 5 年应达到的目标：在专业技能和职业素养方面达到 IE 工程师水平，能够以 IE 工程师或者 IE 研究人员的角色解决工业及服务领域的效率、成本和质量等复杂工程问题，并具备成长为高级 IE 工程师、IE 专家和高级研究人才的潜力。

Five-Year Graduation Goals: In terms of professional skills and professional ethics, achieve the level of an Industrial Engineer (IE) within five years after graduation. Be

able to address complex engineering problems related to efficiency, cost, and quality in industrial and service sectors, functioning in roles such as an IE Engineer or IE Researcher, and possess the potential to grow into a senior IE Engineer, IE expert, and advanced researcher.

## 二、毕业要求 Graduation Requirements

毕业时学生应在知识、能力和素质三个方面达到下列要求:

The students graduated should meet the following requirements in terms of knowledge, ability and quality.

1. 问题分析。能够综合运用所学理论和方法对工业及服务系统进行识别、表达、分析，结合文献研究获得有效结论。

1. Problem analytical. The students graduated should be able to identify, express and analyze the industrial and service systems by using the theories and methods learned, and get effective conclusions through literature research.

2. 设计/开发解决方案。能够针对工业与服务系统进行规划、设计、优化、评价和改善，以提高效率、提升质量和降低成本，并能在所有环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

2. Design/develop solutions. The students graduated should be able to plan, design, optimize, evaluate and improve industrial and service systems to improve efficiency, quality and reduce costs, and embody innovation consciousness in all links within realistic constraints such as social, health, safety, law, culture and environment.

3. 研究。能够基于科学原理并采用科学方法对工业和服务系统的具体问题进行研究，包括实验设计、实验实施和实验数据处理与分析。

3. Research. The students graduated should be able to conduct research on specific issues of industry and service systems based on scientific principles and scientific methods, including experiment design, experiment implementation, and experiment data processing and analysis.

4. 使用现代工具。能够针对工业与服务系统的具体问题，开发、选择与使用恰当的技术、资源、现代管理工具和信息技术工具，对质量、成本和效率等问题进行预测与数值模拟。

4. Use modern tools. The students graduated should have the ability to develop, select and use the appropriate technology, resources, modern management tools and

information technology tools to predict and simulate the quality, cost and efficiency of industry and service systems.

5.工程与社会。能够基于工业与服务系统相关背景知识进行合理分析，评价工业工程实践和复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

5. Engineering and society. Being able to conduct rational analysis based on background knowledge of industrial and service systems, evaluating the impact of industrial engineering practices and solutions to complex engineering problems on society, health, safety, law, and culture, and understanding the responsibilities to be undertaken.

6. 环境和可持续发展：能够理解和评价针对复杂工程问题的工业工程实践对环境、社会可持续发展的影响。

6. Environment and Sustainable Development: Capable of understanding and evaluating the impact of industrial engineering practices on the environment and social sustainable development in addressing complex engineering problems.

7.职业规范。具有人文社会科学素养、社会责任感，能够在工业工程实践中理解并遵守工程职业道德和规范，履行责任。

7. Professional Ethics: Possessing humanistic and social scientific literacy, a sense of social responsibility, capable of understanding and adhering to engineering professional ethics and standards, and fulfilling responsibilities in industrial engineering practice.

8. 个人和团队。具有良好的团队合作意识和组织协调能力，能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。

8. Individual and Team: Possessing strong teamwork awareness and organizational coordination abilities, capable of assuming roles as individuals, team members, and leaders within interdisciplinary teams, and working effectively in such contexts.

9.沟通。具备良好的沟通表达、人际交往能力，能够就具体问题与业界同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令，并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。

9. Communication: Possessing excellent communication and interpersonal skills, capable of effectively communicating and interacting with colleagues in the industry and the general public regarding specific issues. This includes writing reports and

designing documents, making presentations, articulating ideas clearly, and responding to instructions. Having an international perspective, and being able to communicate and interact in cross-cultural contexts.

10.项目管理。理解并掌握工程管理原理、经济学原理与决策方法，并能在工业与服务系统中的承担并完成项目管理任务。

10. Project management ability. The student graduated should understand and master engineering management theory, economic theory and decision-making methods, and be able to undertake and complete project management tasks in industry and service systems.

11.终身学习。具有自主学习与终身学习的意识，具备独立学习，适应社会和技术发展的能力。

11. Learning ability. The student who graduated should have the consciousness of self-learning and lifelong learning, and the ability to study independently and adapt to the development of society and technology.

### **三、学分要求 Credits Requirements**

选择工业工程专业为双学位的学生须具备必要的数学、自然科学的基础理论，并按照本培养方案修完全部课程（52 学分），其中对第一学位专业已修过的课程，可以申请替代，替代课程的总学分不能超过本培养方案的 20%。修完全部课程并通过毕业设计环节，符合《西南交通大学学士学位授予工作细则》和《西南交通大学本科生辅修与双学位管理办法》规定者，方可授予工业工程专业学位证书。

Students choosing industrial engineering as the dual degree, should master the basic theories of mathematics and natural science, and complete the courses study according to this undergraduate program(52 Credits). If they have completed some courses study listed in this program in their majors of first degree, they can apply to make a replacement for the courses, and the total credits of the replaced courses cannot exceed 20% of the total credits of this undergraduate program. If the students complete all the required courses study and pass the graduation design, and meet the requirements of the Rules for the Granting of Bachelor's Degrees in Southwest Jiaotong University and the Regulations for the Administration of Supplementary and Double Degrees for Undergraduates in Southwest Jiaotong University, they can be granted the degree

certificate of industrial engineering.

## 四、学位 Degree

学位：管理学学士

Degree: Bachelor of Management

## 五、课程设置 Course Programs

| 课程类型<br>Course Type                                     | 课程名称<br>Course Name                                   | 课程性质<br>Nature of Course | 学分<br>Credits | 开课学期<br>Semester | 开课学院<br>School                               | 备注<br>Notes |
|---|---|--------------------------|---------------|------------------|--|-------------|
| 学科基础<br>7 学分<br>Discipline<br>Fundamentals 7<br>Credits | 管理学原理<br>Principles of Management                     | 必修<br>Compulsory         | 3             | 春季<br>Spring     | 经管<br>School of Economics and Management     |             |
|   | 运筹学 A<br>Operations Research A                        | 必修<br>Compulsory         | 4             | 春季<br>Spring     | 经管<br>School of Economics and Management     |             |
| 专业基础<br>8 学分<br>Specialty<br>Fundamentals 8<br>Credits  | 系统工程<br>Systems Engineering                           | 必修<br>Compulsory         | 3             | 秋季<br>Autumn     | 运输<br>School of Transportation and Logistics |             |
|   | 基础工业工程<br>Fundament of Industrial Engineering         | 必修<br>Compulsory         | 3             | 秋季<br>Autumn     | 机械<br>Sch. of Mech. Eng.                     |             |
|   | 工程经济学<br>Engineering Economics                        | 必修<br>Compulsory         | 2             | 春季<br>Spring     | 机械<br>Sch. of Mech. Eng.                     |             |
| 专业课程<br>27 学分<br>Specialized<br>Courses 27<br>Credits   | 生产计划与控制<br>Production Planning and Control            | 必修<br>Compulsory         | 3             | 秋季<br>Autumn     | 机械<br>Sch. of Mech. Eng.                     |             |
|   | 人因工程<br>Human Factors Engineering                     | 必修<br>Compulsory         | 4             | 春季<br>Spring     | 机械<br>Sch. of Mech. Eng.                     |             |
|   | 物流分析与设施规划<br>Logistics Analysis and Facility Planning | 必修<br>Compulsory         | 3             | 秋季<br>Autumn     | 机械<br>Sch. of Mech. Eng.                     |             |
|   | 质量管理与可靠性<br>Quality Management and Reliability        | 必修<br>Compulsory         | 3             | 秋季<br>Autumn     | 机械<br>Sch. of Mech. Eng.                     |             |
|   | 人工智能与机器学习<br>Machine learning                         | 必修<br>Compulsory         | 3             | 秋季<br>Autumn     | 机械<br>Sch. of Mech. Eng.                     |             |

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|---|---|------------------|----|--------------|-----------------------------|--|
|   | 供应链管理 A<br>Supply Chain Management A      | 必修<br>Compulsory | 3  | 春季<br>Spring | 机械<br>Sch. of Mech.<br>Eng. |  |
|   | 项目管理<br>Project Management                | 必修<br>Compulsory | 2  | 春季<br>Spring | 机械<br>Sch. of Mech.<br>Eng. |  |
|   | 系统建模与仿真<br>System Modeling and Simulation | 必修<br>Compulsory | 3  | 秋季<br>Autumn | 机械<br>Sch. of Mech.<br>Eng. |  |
|   | 数据分析与应用<br>Data Analysis and Application  | 必修<br>Compulsory | 3  | 春季<br>Spring | 机械<br>Sch. of Mech.<br>Eng. |  |
| <b>实践类课程<br/>10 学分<br/>Practical<br/>Courses 10<br/>Credits</b> | 综合课程设计<br>Comprehensive Curriculum Design | 必修<br>Compulsory | 2  | 秋季<br>Autumn | 机械<br>Sch. of Mech.<br>Eng. |  |
|   | 毕业设计（论文）<br>Graduation Project (Thesis)   | 必修<br>Compulsory | 8  | 春季<br>Spring | 机械<br>Sch. of Mech.<br>Eng. |  |
| <b>总学分<br/>Total Credits</b>                                    |   |                  | 52 |              |                             |  |