

## 课程详述

### COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	课程名称 Course Title	工程学引论 Prolegomenon to Engineering
2.	授课院系 Originating Department	机械与能源工程系 Department of Mechanical and Energy Engineering
3.	课程编号 Course Code	ME111
4.	课程学分 Credit Value	3
5.	课程类别 Course Type	通识选修课程 General Education (GE) Elective Courses
6.	授课学期 Semester	春季 Spring
7.	授课语言 Teaching Language	中、英双语 Chinese-English bilingual
8.	授课教师、所属学系、联系方式 (如属团队授课, 请列明其他授课教师) Instructor(s), Affiliation & Contact (For team teaching, please list all instructors)	路冬 教学副教授 机械与能源工程系 <a href="mailto:lud@sustech.edu.cn">lud@sustech.edu.cn</a> Lu Dong Teaching Associate Professor Dept. Mechanical and Energy Engineering, <a href="mailto:lud@sustech.edu.cn">lud@sustech.edu.cn</a>
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	曾千里 <a href="mailto:zengql@sustech.edu.cn">zengql@sustech.edu.cn</a> 黄渊建 <a href="mailto:huangyj@sustech.edu.cn">huangyj@sustech.edu.cn</a> 机械与能源工程系
10.	选课人数限额(可不填) Maximum Enrolment (Optional)	50

11. 授课方式 Delivery Method	讲授	习题/辅导/讨论	实验/实习	其它(请具体注明)	总学时
	Lectures	Tutorials	Lab/Practical	Other (Please specify)	Total
学时数 Credit Hours	32		32		64
12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	无 None				
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	机械工程专业其它课程及实践 Other mechanical engineering courses and practice.				
14. 其它要求修读本课程的学系 Cross-listing Dept.	对工程类专业感兴趣的同学 Students who are interested in Mechanical Engineering.				

### 教学大纲及教学日历 SYLLABUS

#### 15. 教学目标 Course Objectives

本课程由工程伦理、工程与科学、工程与艺术、工程与工程师、设计与创新、制造与制作等内容组成。通过本课程的学习，不仅使学生了解与工程相关的基本概念和基础知识，同时通过课程项目实践，培养学生发现工程问题、定义工程问题、创造性解决工程问题的能力。

The course consists of engineering ethics, engineering and science, engineering and art, engineering and engineer, design and innovation, manufacturing and production. Through this course, students not only understand the basic concepts and basic knowledge related to engineering, but also develop students' ability to discover engineering problems, define engineering problems, and creatively solve engineering problems through curriculum project practice.

#### 16. 预达学习成果 Learning Outcomes

- 了解工程伦理概念；理解工程与科学、工程与艺术的关系。
  - 了解当代工程师的职责与使命。
  - 了解产品设计的概念与制造（制作）流程。
  - 以小组为单位完成选定产品从“市场调查-设计-创新-制造（制作）”的全过程，完成的产品参与期末课程展示。
- Understand engineering ethics concepts. Understand the relationship between engineering and science, engineering and art.
  - Understand the responsibilities and mission of contemporary engineers
  - Understand and master the manufacturing methods and basic processes.
  - Complete the whole process of "market survey -design-innovation-manufacturing" of selected products on a group-by-group basis. The completed product participates in the final course presentation.

#### 17. 课程内容及教学日历（如授课语言以英文为主，则课程内容介绍可以用英文；如团队教学或模块教学，教学日历须注明主讲人）

**Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)**

理论部分		
课程内容	教学要求	学时分配
<p>绪论</p> <ul style="list-style-type: none"> <li>• 工程学的概念</li> <li>• 本课程的性质、任务和主要内容</li> <li>• 课程安排与考核标准</li> </ul> <p>Introduction</p> <ul style="list-style-type: none"> <li>➢ Concept of Engineering</li> <li>➢ The objectives, outcomes and main topics of this course</li> <li>➢ Schedules and grading policies</li> </ul>	<ul style="list-style-type: none"> <li>• 了解工程学的基本概念</li> <li>• 了解本课程在机械工程、机器人工程专业培养方向的地位，了解其目标、任务、内容、课程安排和考核方式</li> <li>➢ Understand the history and importance of Design and Manufacturing</li> <li>➢ Understand the importance of this course to mechanical engineering and robot engineering education program</li> <li>➢ Understand the objectives, expected outcomes, main topics, schedules and grading policies of this course</li> </ul>	2
<p>工程伦理、工程与科学、工程与艺术</p> <ul style="list-style-type: none"> <li>• 工程伦理概念与案例</li> <li>• 工程与科学、工程与艺术关系</li> </ul> <p>Engineering Ethics, Engineering and Science, Engineering and Art</p> <ul style="list-style-type: none"> <li>➢ Engineering Ethics</li> <li>➢ Engineering and Science, Engineering and Art</li> </ul>	<ul style="list-style-type: none"> <li>• 了解工程伦理的概念</li> <li>• 理解工程与科学、工程与艺术的关系</li> <li>➢ Understand the concept of engineering ethics</li> <li>➢ Understand the relationship between engineering and science, engineering and art</li> </ul>	6
<p>工程与工程师</p> <ul style="list-style-type: none"> <li>• 工程师应具备的素质</li> <li>• 工程师的职责与使命</li> <li>• 工程师终身学习的意义</li> </ul> <p>Engineering and engineer</p> <ul style="list-style-type: none"> <li>➢ The qualities that engineers should possess</li> <li>➢ Engineer's duties and mission</li> <li>➢ The meaning of lifelong learning for engineers</li> </ul>	<ul style="list-style-type: none"> <li>• 了解工程师应具备的素质</li> <li>• 理解工程师的职责与使命</li> <li>• 掌握终身学习的方法</li> <li>➢ Understand the qualities that engineers should have</li> <li>➢ Understand the responsibilities and mission of the engineer</li> <li>➢ Mastering lifelong learning methods</li> </ul>	2
<p>设计与创新</p> <ul style="list-style-type: none"> <li>• 产品开发与设计概念</li> <li>• 产品开发与设计方法及流程</li> <li>• 产品开发与设计项目管理</li> </ul> <p>Design and innovation</p> <ul style="list-style-type: none"> <li>➢ Concepts of Product development and design</li> <li>➢ Product design methods and processes</li> <li>➢ Project management</li> </ul>	<ul style="list-style-type: none"> <li>• 了解产品开发与设计概念</li> <li>• 了解产品开发与设计方法及流程</li> <li>• 学习产品开发与设计项目管理方法</li> <li>➢ Understand the concept of product development and design</li> <li>➢ Understand the methods and processes of product development and design</li> <li>➢ Learning project management methods of product development and design</li> </ul>	6
<p>制造与制作</p> <ul style="list-style-type: none"> <li>• 制造（制作）方法</li> <li>• 制造（制作）流程</li> <li>• 可制造（制作）性</li> <li>• 零件的装配</li> <li>• 产品测试</li> </ul> <p>Manufacturing and production</p> <ul style="list-style-type: none"> <li>➢ Methods of manufacturing and production</li> <li>➢ Process of manufacturing and production</li> <li>➢ Manufacturability</li> <li>➢ Assembly of parts</li> <li>➢ Product testing</li> </ul>	<ul style="list-style-type: none"> <li>• 了解制造（制作）方法</li> <li>• 了解制造（制作）流程</li> <li>• 了解可制造（制作）性</li> <li>• 学习零件的装配方法</li> <li>• 学习产品测试方法</li> <li>➢ Understand the methods of manufacturing and production</li> <li>➢ Understand the process of manufacturing and production</li> <li>➢ Understand the manufacturability of parts</li> <li>➢ Learning the assemble methods of parts</li> </ul>	8
<p>产品性能评价</p> <ul style="list-style-type: none"> <li>• 产品质量</li> <li>• 产品成本</li> <li>• 用户反馈</li> </ul> <p>Product performance evaluation</p> <ul style="list-style-type: none"> <li>➢ product quality</li> <li>➢ Product cost</li> <li>➢ Customer feedback</li> </ul>	<ul style="list-style-type: none"> <li>• 了解产品评价的指标及评价方法</li> <li>• 对完成的小组产品进行评价</li> <li>• 对完成产品进行用户满意度调查</li> <li>➢ Understand the indicators and evaluation methods of product evaluation</li> <li>➢ Evaluate products</li> <li>➢ User satisfaction survey of products</li> </ul>	6

实验部分	
实验内容及要求	学时分配
组建团队（每5人一组，每组选1名组长），对项目背景、必要性进行市场调查，确定项目主题 Form a team (a group of 5 people, each team selects a team leader), conduct market research on the background and necessity of the project, and determine the project theme.	4
完善项目详细实施计划，绘制项目执行进度表，组长为项目管理者，总体把控项目进展 Improve the detailed implementation plan of the project, draw the project execution schedule, the team leader is the project manager, and the overall control project progresses.	4
零部件制造、零部件装配、产品调试 Parts manufacturing, component assembly, product commissioning	16
产品用户满意度调查，产品性能评价 Product user satisfaction survey, product performance evaluation	4
项目研究报告提交，产品展示及课程答辩 Project research report submission, product display and course response	4

18. 教材及其它参考资料 Textbook and Supplementary Readings

Saeed Moaveni. Engineering Fundamentals: An Introduction to Engineering (6th Edition), Cengage Learning, 2019.
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课程评估 ASSESSMENT

19. 评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance				
课堂表现 Class Performance				
小测验 Quiz				
课程项目 Projects		30		
平时作业 Assignments		20		
期中考试 Mid-Term Test				
期末考试 Final Exam				
期末报告 Final Presentation		50		

其它（可根据需要  
改写以上评估方  
式）  
**Others (The  
above may be  
modified as  
necessary)**

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20. 记分方式 **GRADING SYSTEM**

<input checked="" type="checkbox"/> A. 十三级等级制 <b>Letter Grading</b> <input type="checkbox"/> B. 二级记分制（通过/不通过） <b>Pass/Fail Grading</b>
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**课程审批 REVIEW AND APPROVAL**

21. 本课程设置已经过以下责任人/委员会审议通过  
**This Course has been approved by the following person or committee of authority**

机械与能源工程系教学委员会
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