

DS203 课程大纲

- 1、2022 秋季学期 (2-6 页码)
- 2、2023 秋季学期起 (7-11 页码)

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	增材制造 Additive Manufacturing
2. 授课院系 Originating Department	创新创意设计学院 School of Design
3. 课程编号 Course Code	DS203
4. 课程学分 Credit Value	3
5. 课程类别 Course Type	专业基础课 Major Foundational Courses
6. 授课学期 Semester	秋季 Fall
7. 授课语言 Teaching Language	英文 English
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)	Thomas KVAN Dean and Chair Professor, School of Design kvan@sustech.edu.cn Room 506, Building 6, Chuangyuan, SUSTech

9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	无 NA				
10.	选课人数限额(可不填) Maximum Enrolment (Optional)					
11.	授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other (Please specify)	总学时 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 N/A				
13.	后续课程、其它学习规划 Courses for which this course is a pre-requisite	无 N/A				
14.	其它要求修读本课程的学系 Cross-listing Dept.	无 N/A				

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

本工作室课程向学生介绍增材制造（3D 打印）在设计客制化实物中的应用，专注于人类生理需求、人类计量学和人体工程学相关知识的运用。学生将结合自身需求和喜好，通过进行自我扫描，为自己设计制作 3D 打印产品。

核心技能：测量动态对象、脚本编写、参数化设计、理解三维运动、增材制造（3D 打印）

This studio course introduces students to the application of additive manufacturing (3D printing) to the design of customized physical products, focusing on human physiological needs, anthropometrics and ergonomics. Students will be invited to scan their bodies and design 3d-printed products for their personal use, considering individual needs and preferences.

Skills: measuring dynamic objects, scripting, parametric design, understanding movement in three dimensions, additive manufacturing (3D printing)

16. 预达学习成果 Learning Outcomes

通过学习，学生将能够：

- 识别、描述和应用人体工程学和人因学的基本原理
- 参考历史和当代先例，识别、描述和应用 3D 形式制作的原则和理论
- 在增材和减材制造过程中展示对材料的理解
- 具备使用 3D 打印、扫描和相关数据转换的基本工具的能力

Upon successful completion of this module, students will be able to:

- Identify, describe and apply basic principles of ergonomics and human factors
- Identify, describe and apply principles and theories of 3D form making with reference to historical and contemporary precedents
- Demonstrate an understanding of materials in the context of additive and subtractive processes for forming
- Demonstrate the ability to use basic tools of 3D printing, scanning and related data conversions

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.)

Week	Content
1	Welcome and introduction, course overview Lecture: Physiological human needs, ergonomics and anthropometrics Lab: Body scan exercise
	Lecture: Additive manufacturing: Processes and materials; design constraints/rules Lab: Body scan analysis
2	Lecture: 3D modeling: from points to surfaces; data conversion and verification Lab: Digital product modelling; data packaging and submission for production 1
	Lecture: Additive manufacturing: Case studies, advanced applications and trends Lab: Informal design reviews; group discussion; design development and refinement
3	Lecture: Competitive product analysis, parametric modeling Lab: Sketch development, parametric model modification, exploration, selection
	Lecture: Digital product rendering Lab: Digital product modelling and tutorials; data packaging, submission for production 2
4	Lecture: Industry talk and/or visit Lab: Individual tutorials
	Final Design review and critique Summary and conclusion; questions and answers; course feedback

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

1.	Gebhardt, A. and Hötter, J.-S. (2016). <i>Additive manufacturing. 3D printing for prototyping and manufacturing</i> , Munich: Hanser.
2.	Harmsen, J., de Haan, A. B., and Swinkels, P. L. (2018). <i>Product and process design: Driving innovation</i> , Berlin and Boston: de Gruyter.
3.	Lidwell, W., Holden, K., and Butler, J. (2003). <i>Universal principles of design</i> , Gloucester, MA: Rockport.
4.	Myers, W. (2018). <i>Bio design</i> , London: Thames and Hudson.

课程评估 ASSESSMENT

19. 评估形式 评估时间 占考试总成绩百分比 违纪处罚 备注

Type of Assessment	of Time	% of final score	Penalty	Notes
出勤 Attendance		10%		
课堂表现 Class Performance				
小测验 Quiz				
课程项目 Projects				
平时作业 Assignments		40%		
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)				

20. 记分方式 GRADING SYSTEM

- A. 十三级等级制 Letter Grading
 B. 二级记分制 (通过/不通过) Pass/Fail Grading

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

Thomas Kvan 关道文
Dean, School of Design 创新创意设计学院院长

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	增材制造 Additive Manufacturing
2.	授课院系 Originating Department	创新创意设计学院 School of Design
3.	课程编号 Course Code	DS203
4.	课程学分 Credit Value	3
5.	课程类别 Course Type	专业基础课 Major Foundational Courses
6.	授课学期 Semester	秋季 Fall
7.	授课语言 Teaching Language	英文 English
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)	Seungwoo Je Assistant Professor, School of Design seungwoo@sustech.edu.cn

9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	无 NA				
10.	选课人数限额(可不填) Maximum Enrolment (Optional)					
11.	授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other (Please specify)	总学时 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 N/A				
13.	后续课程、其它学习规划 Courses for which this course is a pre-requisite	无 N/A				
14.	其它要求修读本课程的学系 Cross-listing Dept.	无 N/A				

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

本工作室课程向学生介绍增材制造（3D 打印）在设计客制化实物中的应用，专注于人类生理需求、人类计量学和人体工程学相关知识的运用。学生将结合自身需求和喜好，通过进行自我扫描，为自己设计制作 3D 打印产品。

核心技能：测量动态对象、脚本编写、参数化设计、理解三维运动、增材制造（3D 打印）

This studio course introduces students to the application of additive manufacturing (3D printing) to the design of customized physical products, focusing on human physiological needs, anthropometrics and ergonomics. Students will be invited to scan their bodies and design 3d-printed products for their personal use, considering individual needs and preferences.

Skills: measuring dynamic objects, scripting, parametric design, understanding movement in three dimensions, additive manufacturing (3D printing)

16. 预达学习成果 Learning Outcomes

通过学习，学生将能够：

- 识别、描述和应用人体工程学和人因学的基本原理
- 参考历史和当代先例，识别、描述和应用 3D 形式制作的原则和理论
- 在增材和减材制造过程中展示对材料的理解
- 具备使用 3D 打印、扫描和相关数据转换的基本工具的能力

Upon successful completion of this module, students will be able to:

- Identify, describe and apply basic principles of ergonomics and human factors
- Identify, describe and apply principles and theories of 3D form making with reference to historical and contemporary precedents
- Demonstrate an understanding of materials in the context of additive and subtractive processes for forming
- Demonstrate the ability to use basic tools of 3D printing, scanning and related data conversions

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.)

Week	Content
1	Welcome and introduction, course overview
2	Additive manufacturing: Processes and materials
3	Additive manufacturing: design constraints/rules
4	Additive manufacturing: Case studies, advanced applications, and trends
5	3D modeling: Sketch development, parametric model modification, exploration, selection
6	3D modeling: from points to surfaces; data conversion and verification
7	3D modeling: Competitive product analysis, parametric modeling
8	Mid-Term Design review and critique
9	Digital product rendering
10	Digital product rendering; Advanced Techniques
11	Digital product rendering; Portfolio Development
12	Informal design reviews; group discussion; design development and refinement
13	Industry talk and/or visit
14	Project tutorials 1
15	Project tutorials 2
16	Final Design review and critique Summary and conclusion; questions and answers; course feedback

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

5.	Gebhardt, A. and Hötter, J.-S. (2016). <i>Additive manufacturing. 3D printing for prototyping and manufacturing</i> , Munich: Hanser.
6.	Harmsen, J., de Haan, A. B., and Swinkels, P. L. (2018). <i>Product and process design: Driving innovation</i> , Berlin and Boston: de Gruyter.
7.	Lidwell, W., Holden, K., and Butler, J. (2003). <i>Universal principles of design</i> , Gloucester, MA: Rockport.
8.	Myers, W. (2018). <i>Bio design</i> , London: Thames and Hudson.

课程评估 ASSESSMENT

19. 评估形式 Type Assessment	评估时间 of Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance		10%		
课堂表现 Class Performance				
小测验 Quiz				
课程项目 Projects				
平时作业 Assignments		40%		
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)				

20. 记分方式 GRADING SYSTEM

- A. 十三级等级制 Letter Grading
 B. 二级记分制 (通过/不通过) Pass/Fail Grading

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

Thomas Kvan 关道文
Dean, School of Design 创新创意设计学院院长