

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	爱因斯坦及其所生活的世界 Albert Einstein and His World: Physicists and Physics Revolution at the Turn of the 20th Century
2.	授课院系 Originating Department	社会科学中心 Center for Social Sciences
3.	课程编号 Course Code	SS132
4.	课程学分 Credit Value	2
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	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)	胡大年 教授 HU Danian, Professor 南方科技大学社会科学中心 Center for Social Sciences, SUSTech E-mail: hudn@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
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

This is a history of science course focusing on some leading physicists and physics revolution at the turn of the 20th century. It discusses what drew scientists to their subjects, how scientific ideas were produced in the first place, how they were received (among both their peers and laypeople), and what consequences the discoveries resulted in. It introduces to students not only Albert Einstein's scientific achievements and their impacts, but also his views on social, political, and religious issues in the world he lived. In fact, students will study Einstein's own writings on world peace and scientists' social responsibilities. This course intends to bridge two different cultures—science and humanities. Non-science-major students will learn to appreciate some fundamental scientific concepts that Einstein and other physicists discovered, while science-major students will understand better the historical contexts of these great physicists' scientific achievements as well as the contributions of their predecessors and contemporaries.

这是一门专注于十九至二十世纪之交的物理学家与物理学革命的科学史课程。通过学习爱因斯坦、洛伦兹、迈克尔逊、卢瑟福和玻尔等著名物理学家研究工作的发展史，学生将了解这些物理学家是如何选择他们所研究的课题的，他们的科学思想是如何发端的，这些科学思想又是怎样被科学家或者非科学家们所接纳的，以及这些科学发现所产生的影响。课程不仅要讨论爱因斯坦的科学成就及其影响，而且将介绍他对当时社会、政治和宗教等问题的看法。同学们将亲自阅读并讨论爱因斯坦关于世界和平及科学家的社会责任感等问题的论述。本课程希望能在科学和人文这两种不同的文化之间架设期相互沟通的桥梁，不仅让非理工科专业的学生学会欣赏爱因斯坦及其同事们所发现的基本科学概念，同时也帮助理工科专业的学生更好地理解这些伟大物理学家之科学成就的历史背景，了解他们的前辈与同时代其他物理学家的贡献。

16. 预达学习成果 Learning Outcomes

Students, who successfully completed this course, should be able to identify not only Einstein's outstanding scientific contributions to modern physics but also his social and political ideas. Through studying Einstein's life as well as those of many distinguished contemporary physicists, students will acquire deeper understanding of the historical contexts that helped cultivate the "Man of the 20th Century" and a group of most creative minds and contributors to modern science.

This course will also develop students' proficiency in analyzing, evaluating, and synthesizing various historical sources through writing assignments; it will also help improve their competence in historical reasoning and oral presentation.

通过课程的学习，学生不仅能够了解爱因斯坦对现代物理学的杰出科学贡献，也能认识到他的社会和政治思想。通过研究爱因斯坦以及当代杰出物理学家的一生，学生将对帮助培养“20世纪最具影响力的伟人”、最

有创造力的头脑和现代科学贡献者的历史背景有更深入的理解。

本课程还将通过写作作业培养学生分析、评估和综合各种历史资料的能力，这也将有助于提高他们的历史推理和口头陈述的能力。

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.)

本课程计划16周完成，每周2学时
16 teaching weeks, 2 hours per week

Week 1: Class Organization and Introduction 课程简介及相关的安排与要求

- All students must complete a questionnaire for this course.
- Course introduction: the syllabus
- Requirements for individual presentations and term papers
- Watch documentary video: "How I See the World"

Week 2: Albert Einstein's Early Life 青少年时期的爱因斯坦

- Childhood, Youth, Student Years
- Albert and Mileva

Readings: Isaacson, Ch. 1-4; Staley, Ch. 1-3.

Week 3: Mileva and Women in Science at the Turn of the 20th-Century 米列娃及20世纪初妇女在科学界的地位

- Watch Documentary Video: *Einstein's Wife*
- Class discussions

Readings: Esterson, Cassidy, and Sime, selected chapters.

Week 4: Physics around 1900 世纪之交的物理学

- Albert Michelson, the Velocity of Light, and the Aether Drift
- The World's Fair
- The International Congress of Physics

Readings: Staley, Ch. 1-5.

Week 5: Einstein's Miraculous Year (I) 爱因斯坦的奇迹年（上）

- Quanta and Molecules, 1905

Readings: Isaacson, Ch. 5; Staley, Ch. 6.

Week 6: Einstein's Miraculous Year (II) 爱因斯坦的奇迹年（下）

- The Special Theory of Relativity

Readings: Isaacson, Ch. 6; Staley, Ch. 7.

Week 7: The Special Theory of Relativity 狭义相对论的发展历史

- The History of Relativity

Readings: Staley, Ch. 8.

Week 8: The Genesis of General Theory of Relativity (GTR) 广义相对论的起源

Readings: Isaacson, Ch. 7-8.

Week 9: Test-1

- Documentary Video: *Einstein's Big Idea (or Einstein Revealed)*

Week 10: General Theory of Relativity 广义相对论的创立, 1911-1915

Readings: Isaacson, Ch. 9-11.

Week 11: Einstein's Worldwide Fame & Global Receptions 爱因斯坦的世界性名誉及其在各国被接纳的情况

Readings: Isaacson, Ch. 12; TBA (to be announced).

Week 12: Einstein's Nobel Prize & His Search for the Unified Field Theory 爱因斯坦的诺贝尔奖及其对统一场论的探索

Readings: Isaacson, Ch. 14-15.

Week 13: Einstein and the Quantum 爱因斯坦与量子

Readings: Stone (selected chapters); Isaacson, Ch. 20.

Week 14: Einstein as a Pacifist 爱因斯坦作为一名和平主义者

- Germany
- Zionism
- The Bomb

Readings: Fritz Stern's Article; Isaacson, Ch. 13, 21, 24.

Week 15: Einstein and China and Chinese Physicists 爱因斯坦与中国及中国物理学家

- The introduction of Einstein's theory of relativity
- Einstein's aborted visit to China in 1922
- From a heroic scientific revolutionary to the "Poor Philosopher"

Readings: Hu, Ch. 2, 4, 5.

Week 16: Conclusion: The Man of the 20th Century 二十世纪最具影响力的伟人

- Einstein and the United States
- Einstein's God
- Scientists' Social Responsibilities

Readings: Isaacson, Ch. 17, 18-19, 22, 24.

Test-2

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

The course instructor will provide required and recommended readings before each session of the lectures. Readings will be selected from the following references:

Required Readings:

Allen Esterson, David C. Cassidy, et al. *Einstein's Wife: The Real Story of Mileva Einstein-Marić* (The MIT

Press, 2019)

Danian Hu. *China And Albert Einstein: The Reception of The Physicist and His Theory in China, 1917-1979*. (Cambridge, MA: Harvard Univ Press, 2005).

Walter Isaacson. *Einstein: His Life and Universe*. (Simon and Schuster, 2007 or later edition).

Richard Staley. *Einstein's Generation: The Origins of the Relativity Revolution* (Chicago: University Of Chicago Press, 2009)

A. Douglas Stone. *Einstein and the Quantum: The Quest of the Valiant Swabian* (Princeton, NJ: Princeton University Press, 2013)

Recommended readings:

Peter Galison, Gerald Holton, and Silvan Schweber, eds. *Einstein for the 21st Century Einstein for the 21st Century*. (Princeton, NJ: Princeton University Press, 2008)

Fred Jerome. *Einstein File: J. Edgar Hoover's Secret War Against the World's Most Famous Scientist*. St Martins Pr., 2003

Abraham Pais. *Subtle Is the Lord: The Science And the Life of Albert Einstein*. Oxford Univ Press, 2005.)

David E. Rowe, Robert Schulmann, eds. *Einstein on Politics: His Personal Thoughts & Public Stands on War & Peace, Zionism, Nuclear Fear, & Personal Freedom*. (Princeton, NJ: Princeton University Press, 2007)

Other possible references for students' term papers:

Fred Jerome. *Einstein on Race and Racism* (Rutgers University Press, 2006).

Max Jammer. *Einstein and Religion: Physics and Theology*. Princeton Univ Press, 2002.

Albert Einstein. *Einstein on Peace*. Edited by Norden Heinz and Nathan Otto. Random House Value Publishing, 1988

Siegfried Grundmann. *Einstein Dossiers: Science And Politics - Einstein's Berlin Period With an Appendix on Einstein's FBI File*. Springer Verlag, 2005

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		10%		Missing 5 or more classes without permission results in a failing grade in this course.
课堂表现 Class Performance		10%		Participation in class discussions
小测验 Quiz		10%		
课程项目 Projects				
平时作业		10%		An individual presentation

Assignments			
期中考试 Mid-Term Test	20%		
期末考试 Final Exam	20%		
学期论文 Term Paper	20%		Term paper
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

