

Innovation in Engineering Sciences from An Anthropological Perspective
312232030
Spring 2024
Syllabus

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Office hours: Monday 11:00am-12:00pm, Tuesday 2:00pm-3:30pm, Wednesday 11:00am-12:00pm, or by appointment

TA: 王靖杰

Note: This syllabus is subject to change.

Course Description

This case-study course is designed to explore the dynamic landscape of innovation within the field of engineering sciences. Through real-world case studies, students will analyze successful and challenging cases of innovation in engineering, examining the technological, ethical and societal implications. The course aims to cultivate a deep understanding of the innovation process, encouraging students to think critically, creatively, and ethnically as they tackle complex engineering challenges.

Course objectives

- Understand what innovation is, and what are conditions for innovation;
- Understand what anthropology is, and how anthropological perspective can help us to better understand engineering;
- Learn about applications of innovation in engineering.

ABET outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Grading Rubric

The students are evaluated on their participation in class, individual learning and group work based on the following grading rubric:

Attendance	20%
Participation	20%
In-class quiz	20%
Final project	20%
Final exam	20%

NO MAKE UP is accepted for any of the above grading criteria.

Video and Audio Recording Policy

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion, and activities without the advance written permission of the instructor, and any such recording properly approved in advance should be used solely for the student's private use.

Academic Integrity

We are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). Unacknowledged direct copying from the work of another person/group/source, or the close paraphrasing of such, is called plagiarism and is a serious offense, equated with cheating in examinations. This applies to copying both from other students' work and from published sources. Paraphrasing, when the original statement is still identifiable and has also no acknowledgement, is plagiarism. The use of artificial intelligence also requires explicit citation and specification of contribution. The Code of Student Conduct allows Sichuan University to take disciplinary action if students don't follow this community expectation.

Tentative Lecture Schedule

- Lecture 1 Course introduction and introduction to "innovation"
- Lecture 2 Understanding "innovation"
- Lecture 3 Anthropology
Biophilia
- Lecture 4 Human-nature interaction
Biomimicry
- Lecture 5 Biomimicry and applications
- Lecture 6 Innovation application in sustainability
Case study of sustainable solutions
- Lecture 7 Innovation application in autonomous vehicles
Case study
- Lecture 8 Innovation application in biomedicine
Case study
- Lecture 9 Innovation application in urban development

- Case study
- Lecture 10 Case report
- Lecture 11 Innovation application in environmental engineering
Case study
- Lecture 12 The future of manufacturing
Case study
- Lecture 13 The future of aerospace engineering
Case study
- Lecture 14 The future of sustainability: prospects and challenges
- Lecture 15 Group project presentation
- Lecture 16 Group project presentation
- Lecture 17 Final Exam