浙江大學

ENGG912

Sustainability & the Environment

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Instructor contact details

Lecturer-in-charge: TBA

Office location: to be announced

Email: TBA

Consultation Times: to be announced, and by appointment

Teaching Times and Locations

The Time and Location: TBA

Units of Credit

The course is worth 6 units of credit, with total of 40 teaching hours.

Course Description

This course aims at helping students who are in engineering and built environment degrees, focus on ‘design thinking’ and finding innovative solutions through developing and experimenting with ideas and reframing problems in devising an optimum solution. Students are to analyse designs which are sustainable and capable of supporting regional economies and populations. Factors of consideration include water and waste management and the supply and distribution of energy. Students will be expected to work cooperatively and collaboratively in teams where they contribute insights and skills from their knowledge. Students are encouraged to come out with responsible and sustainable solutions in response to real-world problems.

Daily activities build capabilities in using ideation and innovation strategies to achieve more imaginative and human-focused outcomes. The course culminates with a ‘sustainable innovation challenge’ that integrates the specialized skills of the cross-disciplinary student teams. In the teamwork that occurs, students are expected to contribute the unique insights, theories, methods, communication forms, and other prior skills from their own academic specialization, in order to enrich the learning of their teams as they cooperate and collaborate on assessment tasks.

Prerequisite

None

Learning Resources

Hawken, P., A. B. Lovins & L.H. Lovins, *Natural capitalism: creating the next industrial revolution*. Little, Brown and Co. Boston., 1999.

Vallero, D and Brasier, C, *Sustainable design : the science of sustainability and green engineering*. Hoboken, N.J., John Wiley, 2008.

Learning Objectives

By the end of this course you should be able to:

- Develop a basic level of ecological literacy and capacity for life-cycle and systems thinking in the design;
- Use these modes of thinking to develop a relational systems view of people and nature mediated by the built environment;
- Engage with our industrial and natural life-support systems seeking symbiosis and resilience.
- Develop the ability to work well in multidisciplinary and multicultural teams and understand the role as team leader and player, and to manage effectively with dysfunctional teams and resolve conflicts;
- Develop project management skills including the ability to plan projects efficiently and effectively, as well as time management;
- Develop an understanding of the environmental, social and economic context in which engineering is practised;
- Utilise a systematic method for quantitatively evaluating a range of alternative design candidate solutions.

Course Delivery

The course will be taught in English through lectures, tutorials, group activities, student projects and presentations. In addition to these, there will also be guest speakers and optional field trips available for students who would like to enhance their learning experience. The course will be delivered within 16 sessions, with each session totaling 2.5 hours-inclusive of both a lecture and tutorial. These sessions will be running during the weekdays, Monday to Friday. The course will be at total 40 hours.

Topics and Course Schedule:

Topic	Activities	Date

Introduction of the course and project briefing	Lecture; Tutorial	01/07/2019
Environment and society	Lecture; Tutorial	02/07/2019
Sustainability frameworks, including industrial metabolism and ecology, dematerialisation and precautionary principle	Lecture; Tutorial	03/07/2019
The Whole System Approach to Sustainable Design	Lecture; Tutorial	04/07/2019
Design for the Environment: Process Synthesis and Analysis Tools	Lecture; Tutorial	05/07/2019
Energy resources, conversion, use and consequences	Lecture; Tutorial	08/07/2019
Energy supply, demand and Distribution generation and Review of existing power sources	Lecture; Tutorial	09/07/2019
Energy use in buildings, embodied energy & LCA	Lecture; Tutorial	10/07/2019
Water resources, use, consequences and control	Lecture; Tutorial	12/07/2019
Sustainable design for water provision, distribution and use	Lecture; Tutorial	12/07/2019
Waste management– principles including heat and mass flows	Lecture; Tutorial; **Quiz**	15/07/2019
Sustainable design, engineering and management in industry	Lecture; Tutorial	16/07/2019
Economics of Sustainable Systems	Lecture; Tutorial **Presentation**	17/07/2019
Sustainable buildings and environment	Lecture; Tutorial **Group Report submission**	18/07/2019
Health, Risk and Safety	Lecture; Tutorial;	19/07/2019
Ethics & Justice	Lecture; Tutorial;	19/07/2019

Assessments:

Class participation	10%	Ongoing
Quiz	20%	15/07/2019
Group project presentation	10%	17/07/2019
Group project report	20%	18/07/2019
Final exam	40%	19/07/2019

Tutorial participation (10%)
Active engagement in class activities and discussions are encouraged to consolidate what has been learnt in lectures.

Quiz (20%)
To be completed during lectures at the set time. Multiple choices and short answers will be required for students to show that they have fully understood what has been taught during lectures.

Group project (20%) and class presentation (10%)
Details of the sustainable design project will be announced and discussed in class. Students will be allocated into groups to complete a group project relating to course topics. They are required to work collaboratively with each other to complete this task and present it to the class through a speech.
A sustainable design project is to be developed, with:

- 8 pages maximum in A4,
- 12 point Times New Roman font
- Single line spacing□
- Late submission will attract a penalty of 10% of the total weighting of the assessment task. A 10% deduction applies for EACH late day and the assessment will not be accepted after 5 working days. Extensions will only be granted upon the basis that there is reasonable medical evidence of illness or any other extreme circumstances that the university may place under consideration. Under no circumstances will extensions be granted for work or any other commitments. A request for an extension must formally submitted to the lecturer in writing prior to the due date, in accordance with the university's assessment policies. Medical certificates or other evidence of extreme misfortune must be submitted through a special consideration form and must contain information that justifies the extension sought.

Final examination (individual) 40%
A 2 hour final exam will be conducted during the university's set examination period.

Grade Descriptors:

HD	High Distinction	85-100
D	Distinction	75-84
Cr	Credit	65-74
P	Pass	50-64
F	Fail	0-49

High Distinction 85-100

Treatment of material evidences an advanced synthesis of ideas
Demonstration of initiative, complex understanding and analysis
Work is well-written and stylistically sophisticated, including appropriate referencing, clarity, and some creativity where appropriate
All criteria addressed to a high level

Distinction 75-84

Treatment of material evidences an advanced understanding of ideas
Demonstration of initiative, complex understanding and analysis
Work is well-written and stylistically strong
All criteria addressed strongly

Credit 65-74

Treatment of material displays a good understanding of ideas
Work is well-written and stylistically sound, with a minimum of syntactical errors
All criteria addressed clearly

Pass 50-64

Treatment of material indicates a satisfactory understanding of ideas
Work is adequately written, with some syntactical errors
Most criteria addressed adequately

Fail 0-49

Treatment of ideas indicates an inadequate understanding of ideas
Written style inappropriate to task; major problems with expression
Most criteria not clearly or adequately addressed

Academic Integrity

Students are expected to uphold the university's academic honesty principles which are an integral part of the university's core values and principles. If a student fails to observe the acceptable standards of academic honesty, they could attract penalties and even

disqualification from the course in more serious circumstances. Students are responsible for knowing and observing accepted principles of research, writing and any other task which they are required to complete.

Academic dishonesty or cheating includes acts of plagiarism, misrepresentation, fabrication, failure to reference materials used properly and forgery. These may include, but are not limited to: claiming the work of others as your own, deliberately applying false and inaccurate information, copying the work of others in part or whole, allowing others in the course to copy your work in part or whole, failing to appropriately acknowledge the work of other scholars/authors through acceptable referencing standards, purchasing papers or writing papers for other students and submitting the same paper twice for the same subject.

This Academic Integrity policy applies to all students of the Zhejiang University in all programmes of study, including non-graduating students. It is to reinforce the University's commitment to maintain integrity and honesty in all academic activities of the University community.

Policy

- The foundation of good academic work is honesty. Maintaining academic integrity upholds the standards of the University.
- The responsibility for maintaining integrity in all the activities of the academic community lies with the students as well as the faculty and the University. Everyone in this community must work together to ensure that the values of truth, trust and justice are upheld.
- Academic dishonesty affects the University's reputation and devalues the degrees offered.
- The University will impose serious penalties on students who are found to have violated this Policy. The following penalties may be imposed:
    - Expulsion;
    - Suspension;
    - Zero mark/fail grade;
    - Marking down;
    - Re-doing/re-submitting of assignments or reports; and
    - Verbal or written warning.