Syllabus of Record

Program: CET Taiwan
Course Code / Title: (TP/ENVR 360) Environmental Health
Contact Hours: 45
Recommended Credits: 3
Primary Discipline / Suggested Cross Listings: Environmental Studies / Public Health, Public Policy, Urban Studies
Language of Instruction: English
Prerequisites / Requirements: None

Description
This course explores key environmental health issues in Taiwan through a cross-cultural lens. Students gain insight into Taiwan's industrial development, urbanization challenges, and pollution control policies. Case studies analyze the impacts of development and urbanization on air, water, and soil quality. The role of environmental advocacy groups is examined. Students compare Taiwan's approach to that of the US in areas like environmental regulation, public health, waste management, and environmental justice. Field study course components allow first-hand investigation of environmental issues. Developing sustainable solutions for Taiwan alongside community stakeholders is a core focus. Cultural immersion and ethical reasoning skills are emphasized.

Objectives
From their participation in this course, students:

- Gain a comprehensive understanding of key environmental health issues in Taiwan, including the impacts of industrial development, urbanization, and pollution on air, water, and soil quality.
- Analyze Taiwan's pollution control policies and compare them with the United States' approaches to environmental regulations, fostering cross-cultural understanding.
- Understand the role and impact of environmental advocacy groups in shaping policies and public awareness in Taiwan.
- Participate in field study classes to observe environmental health issues firsthand, providing practical insights and real-world examples.
- Enhance ethical reasoning skills through discussions and analyses of environmental health issues, policies, and solutions.

Course Requirements
Students are expected to attend each class as outlined in the CET Attendance Policy. Active participation in the classroom is essential.

Graded assignments include:

- **Participation**: Students are to read all assigned materials before each class session and come prepared to participate thoughtfully in discussions. There will be around 50 pages of reading per week.

Class Participation Grading Rubric

	A – 90-100% Exemplary	**B – 80-89% Proficient**	**C – 70-79% Developing**	**D – 60-69% Unacceptable**	**F – 0-59% Missing**
Frequency of class participation	Actively contributes 2+ times per meeting	Actively contributes at least 1 time per meeting	Actively contributes at least half of the time during term	Actively contributes less than half of the time during term	Does not contribute
Quality of class participation	Contribution is always thoughtful, accurate, and constructive, frequently interacting with peers	Contribution is mostly thoughtful, accurate, and constructive, usually interacting with peers	Contribution is somewhat thoughtful, accurate, and constructive, sometimes interacting with peers	Contribution is rarely thoughtful, accurate, and constructive, rarely interacting with peers	Does not contribute or interact with peers
Level of class preparation	Always fully prepared and on task	Mostly prepared and on task	Somewhat prepared and on task	Rarely prepared and on task	Consistently unprepared and not on task

- **Group Presentation**: Students will be divided into four groups, with each group selecting one of the following topics: air quality, water quality, soil protection, or waste management. Each group will deliver a 20-minute presentation of a comparative analysis of global policies and regulations related to their chosen topic, followed by a 10-minute Q&A session.

  Grading Criteria:
  1. Content: Depth and accuracy of information, including the comparison of policies and regulations covering but not limited to the history, development, and current status, etc.
  2. Structure: Logical organization of the presentation, with clear and cohesive

sections.
3. Presentation: Clarity, delivery, and the use of visual aids or other supporting materials.
4. Q&A: Ability to effectively respond to questions and engage with peers and the instructor.
5. Individual Component: Each student will also receive an internal peer review from their group members, assessing their contributions to the group's work.

- **Written assignments**: Students will submit two written essays (double-spaced, Vancouver citation style) throughout the course:

1. Field study reflection (400-500 words): Students will select one of the three field study classes and write a reflection (all field study classes require attendance). The reflection should include, but is not limited to, the following points:
    - Understanding of the Issue: Describe the environmental issue observed during the class and explain its significance.
    - Role of the Stakeholder: Analyze the role played by the site or organization visited in relation to the environmental issue. Consider their contributions, impact, or involvement.
    - Ethical Considerations: Identify and discuss any ethical considerations related to the environmental issue. Reflect on how these considerations were addressed (or not) by the site or organization.
    - Sustainability of Actions: Evaluate whether the actions taken by the site or organization are sustainable. If you believe they are not, suggest improvements or alternative approaches that could enhance sustainability.

2. Case study essay (800-900 words): Students will select an environmental health-related case study from Taiwan, USA, or another country that was not covered during the course. Students should cite credible sources, including at least three from peer-reviewed scientific journals. The essay should introduce and analyze the case, addressing the following aspects:
    - The Issue: Clearly define the environmental health issue at the core of the case study.
    - Historical, Cultural, and Geographical Background: Provide context by discussing the historical events, cultural factors, and geographical settings that have influenced the issue.
    - Ethical Considerations: Examine the ethical dilemmas or challenges associated with the case.
    - Intervention Measures: Describe the measures taken to address the issue, including any public health interventions, community actions, or technological solutions.
    - Policy and Regulation Influences: Analyze the impact of the case on policies and regulations.
    - Stakeholders: Identify the key stakeholders involved, such as government agencies, NGOs, local communities, and industries, and discuss their roles and

perspectives.
- Sustainability: Evaluate the sustainability of the actions taken in the case and suggest ways in which the approach could be improved for long-term success.
- What Was Overlooked: Identify any significant aspects or perspectives that were neglected in addressing the issue.
- Your Perspective: Reflect on how you would have approached the situation differently, offering suggestions for more effective strategies or solutions.

Grading

The final grade is determined as follows:

- Class Preparation and Discussion 20%
- Group Presentation 30%
- Field Study Reflection 25%
- Case Study Essay 25%

Reading materials

Aftab, J., Abid, N., Sarwar, H., & Veneziani, M. (2022). Environmental ethics, green innovation, and sustainable performance: Exploring the role of environmental leadership and environmental strategy. Journal of Cleaner Production, 378, 134639. https://doi.org/https://doi.org/10.1016/j.jclepro.2022.134639

Baccarelli, A., Dolinoy, D. C., & Walker, C. L. (2023). A precision environmental health approach to prevention of human disease. Nature Communications, 14(1), 2449. https://doi.org/10.1038/s41467-023-37626-2

Canadian Council of Ministers of the Environment, & Health, F.-P.-T. C. o. E. a. O. (2002). From Source to Tap The multi-barrier approach to safe drinking water. Retrieved from https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/source-multi-barrier-approach-safe-drinking-water-health-canada.html

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Chen, Y. (2018). Effects of urbanization on municipal solid waste composition. Waste Management, 79, 828–836. https://doi.org/10.1016/j.wasman.2018.04.017

Chen, Y., Huang, W., Wang, W., Juang, J., Hong, J., Kato, T., & Luyssaert, S. (2019). Reconstructing Taiwan's land cover changes between 1904 and 2015 from historical maps and satellite images. Scientific Reports, 9(1). https://doi.org/10.1038/s41598-019-40063-1

Chen, Wei-Jian, Yu-Chun Li, Pau-Chung Chen, Mei-Lien Chen, and Chang-Fu Wu. Environmental and Occupational Health. Taiwan: Chuliu Book Company, 2023.

Chu, W. (2019). Catch-up and Learning in Taiwan: The Role of Industrial Policy. In A. Oqubay & K. Ohno (Eds.), How Nations Learn: Technological Learning, Industrial Policy, and Catch-up (pp. 0). Oxford University Press. https://doi.org/10.1093/oso/9780198841760.003.0006

Ho, M. (2011). Environmental Movement in Democratizing Taiwan (1980–2004): A Political Opportunity Structure Perspective. In J. Broadbent & V. Brockman (Eds.), East Asian Social Movements: Power, Protest, and Change in a Dynamic Region (pp. 283-314). Springer New York. https://doi.org/10.1007/978-0-387-09626-1_13

Huang, H., Hsiao, H. M., & Hsu, S. (2016). Taiwan's Land Use after World War II: An Ecological Modernization Approach. In Palgrave Macmillan UK eBooks (pp. 223–250). https://doi.org/10.1007/978-1-137-57231-8_10

Hseu, Z., Su, S., Lai, H., Guo, H., Chen, T., & Chen, Z. (2010). Remediation techniques and heavy metal uptake by different rice varieties in metal-contaminated soils of Taiwan: New aspects for food safety regulation and sustainable agriculture. Soil Science & Plant Nutrition, 56(1), 31-52. https://doi.org/https://doi.org/10.1111/j.1747-0765.2009.00442.x

Landrigan, P. J., Fuller, R., Acosta, N. J. R., Adeyi, O., Arnold, R., Basu, N., Baldé, A. B., Bertollini, R., Bose-O'Reilly, S., Boufford, J. I., Breysse, P. N., Chiles, T., Mahidol, C., Coll-Seck, A. M., Cropper, M. L., Fobil, J., Fuster, V., Greenstone, M., Haines, A., . . . Zhong, M. (2018). The Lancet Commission on pollution and health. The Lancet, 391(10119), 462-512. https://doi.org/10.1016/S0140-6736(17)32345-0

Lin, Y. (2018). Reconstructing Genba: RCA Groundwater Pollution, Research, and Lawsuit in Taiwan, 1970–2014. positions: asia critique, 26(2), 305-341. https://doi.org/10.1215/10679847-4351578

Liu, T., & Beattie, J. (2016). Environment, Modernization and development in East Asia: Perspectives from Environmental History. Springer.

Liu KY. (2022). Moving towards a world without oil, how can Taiwan's petrochemical industry adapt? CommonWealth Magazine. Available from: https://english.cw.com.tw/article/article.action?id=3190 (accessed 27 August 2024)

Rolston III, H. (2020). A New Environmental Ethics: The Next Millennium for Life on Earth (2nd ed.). Routledge. https://doi.org/10.4324/9781003036746

Smith K, Woodward A, Campbell-Lendrum D, Chadee D, Honda Y, Liu Q et al. Human health: impacts, adaptation, and co-benefits. In Field CB, Barros V, Dokken DJ, editors, Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. 1 ed. Cambridge UK : Cambridge University Press. 2014. p. 709-754

Szyszkowicz, M. (2019). The Air Quality Health Index and all emergency department visits. Environ Sci Pollut Res Int, 26(24), 24357-24361. https://doi.org/10.1007/s11356-019-05741-7

Waage, J., Yap, C., Bell, S., Levy, C., Mace, G., Pegram, T., Unterhalter, E., Dasandi, N., Hudson, D., Kock, R., Mayhew, S., Marx, C., & Poole, N. (2015). Governing the UN Sustainable Development Goals: interactions, infrastructures, and institutions. The Lancet Global Health, 3(5), e251-e252. https://doi.org/10.1016/S2214-109X(15)70112-9

Children and digital dumpsites: e-waste exposure and child health. (2021). World Health Organization.

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Lo, W., Shie, R., Chan, C., & Lin, H. (2017). Burden of disease attributable to ambient fine particulate matter exposure in Taiwan. Journal of the Formosan Medical Association, 116(1), 32–40. https://doi.org/10.1016/j.jfma.2015.12.007

Chen, C., Chio, C., Yuan, T., Yeh, Y., & Chan, C. (2018). Increased cancer incidence of Changhua residents living in Taisi Village north to the No. 6 Naphtha Cracking Complex. Journal of the Formosan Medical Association, 117(12), 1101–1107. https://doi.org/10.1016/j.jfma.2017.12.013

Chiang, T., Yuan, T., Shie, R., Chen, C., & Chan, C. (2016). Increased incidence of allergic rhinitis, bronchitis and asthma, in children living near a petrochemical complex with SO2 pollution. Environment International, 96, 1–7. https://doi.org/10.1016/j.envint.2016.08.009

Chen, Y., Lin, W., & Chan, C. (2014). The impact of petrochemical industrialisation on life expectancy and per capita income in Taiwan: an 11-year longitudinal study. BMC Public Health, 14(1). https://doi.org/10.1186/1471-2458-14-247

Chiang, L., Wang, Y., Chen, Y., & Liao, C. (2021). Quantification of land use/land cover impacts on stream water quality across Taiwan. Journal of Cleaner Production, 318, 128443. https://doi.org/10.1016/j.jclepro.2021.128443

Pai, C., Leong, D., Chen, C., & Wang, G. (2020). Occurrences of pharmaceuticals and personal care products in the drinking water of Taiwan and their removal in conventional water treatment processes. Chemosphere, 256, 127002. https://doi.org/10.1016/j.chemosphere.2020.127002

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Outline of Course Content

Topic 1 – Introduction to Environmental Health in Taiwan
- Overview of environmental health
- Historical context of Taiwan's environmental issues

Topic 2 – Industrial Development and Urbanization
- Taiwan's industrialization and urbanization history
- Impact of industrialization and urbanization on air quality and climate change

Topic 3 – Air Quality and Pollution Control Policies
- Air pollution sources and control measures in Taiwan
- Comparing Taiwan and US air quality regulations

Topic 4 – Water Quality Management
- Water pollution sources and management strategies in Taiwan
- Case study: Blackfoot disease – arsenic levels in drinking water
- Field study: Taiwan Blackfoot Disease Socio-Medical Service Memorial House

Topic 5 – Soil Contamination and Remediation
- Soil contamination issues and remediation efforts
- Case study: soil heavy metal contamination in Changhua County, Taiwan

Topic 6 – Waste Management Strategies
- Overview of waste management practices in Taiwan
- Field study: Beitou Incinerator

Topic 7 – Climate Change
- Climate change impacts on environmental health
- Climate change mitigation and adaptation strategies
- Global and regional climate policies

Topic 8 – Environmental Justice and Community Health
- Case study: RCA Taiwan

Topic 9 – Environmental Advocacy and Public Health
- Case study: petrochemical industry in Taiwan
- Field study: Mailiao Culture Association (麥仔簝文化協)

Topic 10 – Ethical Reasoning in Environmental Health
- Ethical considerations in environmental health decisions
- Ethical dilemmas in environmental policy-making