7. Energy and Environmental

Module designation	Energy and Environmental
Code, if applicable	CIL 23827
Semester(s) in which the module is taught	2nd
Person responsible for the module	Dr. Ir. Hermawan, DEA
Language	*Indonesian and English*
Relation to curriculum	*Elective*
Teaching methods	*Lecture, Discussion (Q & A), Presentation.*
Type of teaching, contact hours	• Regular meeting with Lecturer 16 times (40 hours with total contact hour per teaching is 2.5 hours weekly for 16 weeks). This activity consists of Lecture: 80 minutes; Q&A: 20 minutes; Discussion: 30 minutes; Presentation: 20 minutes. • Independent work on reading materials and literature review (48 hours, 3 hours weekly for 16 weeks) • Preparing paper and final personal assignment (40 hours, 2.5 hours weekly for 16 weeks) • Personal work on reflecting the course's gained knowledge to the student's research topic (22 hours, 1.35 hour weekly for 16 weeks) Total contact hours in 1 semester = 150 hours
Student Workload for One ECTS	• Face-to-face Lecturers in class (6.67 hours) • Independent work (reading books, materials, papers, literature review, etc. : 8 hours) • Preparing paper and structured assignments (doing homework or assignments given by lecturers : 6.67 hours) • Personal work on reflecting the course's gained knowledge to the student's research topic (3.67 hours) • Total workload for one ECTS = 25 hours
Laboratory Work	*There is no required laboratory work for this course*
Credit points	*2 SKS which is equivalent to 6 ECTS*
Requirements according to the examination regulations	Minimum attendance of lectures 75%
Required and recommended prerequisites for joining the module	Existing competencies in renewable energy
Module objectives/intended learning outcomes	• Able to measure trends in energy use in the household, industrial, and transportation sectors and their impact on the environment.

	• Able to evaluate the use of renewable energy (technology, construction, and the impact on the environment) and the use of some waste as an energy source.
Content	• Energy use in household, industry & transportation sectors, • renewable energy sources, • fossil energy and the environment, • waste and the environment, • overall trends in energy use, • manufacturing energy in households, • energy in passenger & freight, • transpo-hydropower, • petroleum energy, • gas & coal energy, • biofuels, nuclear and fuel cells, • plastic waste & used tires, • livestock and human waste, • agricultural & plantation waste.
Exams and assessment formats	One oral Midterm assessment (15 minutes each), one final oral exam (20 minutes), take-home written assignments.
Study and examination requirements	
Reading list	Breeze, P., 2019. *Power Generation Technologies*. Newnes. Infield, D. and Freris, L., 2020. *Renewable Energy in Power Systems*. John Wiley & Sons. Dincer, I. (1998). Energy and Environmental Impacts: Present and Future Perspectives. Energy Sources, 20(4-5), 427-453. Gyamfi, B. A., Bein, M. A., Adedoyin, F. F., & Bekun, F. V. (2022). How Does Energy Investment Affect the Energy Utilization-Growth-Tourism Nexus? Evidence from E7 Countries. Energy & Environment, 33(2), 354-376. Hsieh, J. C. (2022). Study of Energy Strategy by Evaluating Energy–Environmental Efficiency. Energy Reports, 8, 1397-1409. Kumar, G., Kim, S. H., Lay, C. H., & Ponnusamy, V. K. (2020). Recent Developments on Alternative Fuels, Energy and Environment for Sustainability. Bioresource technology, 317, 124010. Loulou, R., Waaub, J.P. and Zaccour, G. eds., 2005. *Energy and Environment* (Vol. 3). Springer Science & Business Media. Sharma, R. K. (2022). Environmental Science. KK Publications. Singh, M. K., & Raghuvanshi, K. K. (2022). Defining and Visualizing Energy and Environment Related Smart

	Technologies. In Smart Technologies for Energy and Environmental Sustainability (pp. 21-38). Springer, Cham.