

Course Name: DDL753 (Design of Sustainable Habitats)

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Course Overview

Many of us love to lead a life in sync with nature but the world is currently facing unprecedented environmental challenges including climate change, heat waves, air, plastic and water pollution. A healthier planet is essential for the health and wellbeing of its inhabitants and it could avoid about 25% of the global burden of disease [1]. There have been campaigns in the design [2], architecture [3] and engineering [4] communities to take positive action against climate breakdown. There is a dire need to consider other impacts besides aesthetics and function while designing products and solutions.

This course would introduce the students to quantify the environmental impacts that the world is facing and how it is affecting our health. The students would then apply easy to use environmental impact assessment tools to address environmental concerns through assignments and a course project. The course will help them to get started to address questions such as what is the impact on our and our planet's health of 1) a bike ride vs. public transport vs. using an EV/IC engine vehicle for travel 2) plastic vs. eco-friendly packaging? 3) AC vs. natural ventilation in buildings 4) reducing our consumption to lead a low carbon lifestyle 5) Eating locally available foods vs. foods with ingredients from far off places 6) green coding 7) growing trees and so on.

The highlights of the course would be:

1. Working on a course project through Life Cycle Assessment (LCA) tools and/or healthy built environment design tools to address the environmental health concerns that we come across in our daily lives
2. Working on hands-on climate responsive built environment design strategies
3. Measurement of parameters causing environmental health issues such as air pollution, heat stress and energy consumption
4. Environmental immersion with communities leading low carbon lifestyles
5. Brainstorming on ways to reduce our own ecological footprint

6. Industry visit(s), guest lecture(s) and watching documentaries related to the course objectives

7. Application of a Systems Thinking approach for a healthier planet

Course outline

Week	Dates (tentative)	Topic	Assignment	Project
1	24-28 July	Course Overview		
2	31 July-4 August	Environmental Impact Assessment Lectures		
3	7-11 August	Use of LCA software for examples	LCA for a real world case	
4	14-18 August	Immersion 1: With low environmental footprint communities	Compare ecological footprint of communities living a low carbon lifestyle with yourself using LCA	
5	21-25 August	LCA for real world examples		
6	28 August- 1 September	Climate Change, Energy Balance, Energy Measurements Lab	Energy Balance for a Country	
7	4-8 September	Health and Wellness in the Built Environment	Building/Urban Scale simulation	
		MID SEMESTER EXAMS		
8	18-22 September	Heat stress (Lectures + Lab)	Heat stress assessment/mitigation for an indoor space/outdoor site	
9	25-29 September	Indoor Air Quality (Lectures + Lab)	IAQ monitoring/improvement for an indoor space	Project Proposal guidelines
		MID SEMESTER BREAK (Immersion 2: a 2 Day trek)	Can Trekking help to reduce our ecological footprint?	
10	9-13 October	Outdoor air pollution (Lectures + Lab)	Air pollution monitoring/mitigation for a site	
11	16-20 October	Course Project Proposal	Project	Course Project Proposal Presentation

12	23-27 October	Industry visit on Plastic Waste Management + Guest Lecture on Strategies for Water Pollution	Wild card Week (Work on an environmental aspect of your choice, not covered in the class)	Field trips for the course project
13	30 October-3 November	Systems Thinking (Example: understanding the nexus between IAQ + thermal comfort + energy)	Proposing a solution for IAQ + thermal discomfort + energy nexus for an indoor space	Data analysis for the course project
14	6-10 November	Documentaries on Environmental Issues	Compare your ecological footprint at the beginning of the class and now	
15	13-17 November	Project Presentations	Project	
		Exam		

References

1. https://www.who.int/health-topics/environmental-health#tab=tab_1
2. <https://www.dezeen.com/2022/09/21/design-declares-campaign-launch-ldf/>
3. <https://solardecathlonindia.in/>
4. <https://energyswaraj.org/>