Human-Centered Green Infrastructure Analysis

Syllabus

Course Name（CH）	人本导向的绿色基础设施分析（英）		
Course Name（EN）	Human-Centered Landscape Analysis Syllabus		
Course ID	50001630023	Language	English
Credits	2	Credit hours	32
Category	Electives	Assessment	Review
Prerequisite	NA		
Full English Course	Yes	Course coordinator	CHEN, Zheng
Teaching Team Members			

1.Introduction and Objectives

1.1Introduction

This is an introductory course to human-centered analysis (including theories, methods and techniques) to support decision making in landscape planning and design. In lectures you will be introduced to different methods, approaches and frameworks for analyzing human experience, perceptions, behaviors and etc. in their interactions with natural and built environments, as well as the impact of environmental interactions on their health and well-being.

We will study frameworks and theories from environmental psychology, behavior science, environmental neuroscience, human geography, and landscape research. Further, analysis methods will be presented and discussed, including classical analysis methods such as cognitive mapping and psychological scales, as well as new methods such as wearable bio-sensing techniques and eye-tracking. Based on introductory lectures the use of different frameworks and methods for investigations of environmental experience, perceptions and behaviors will be exercised based on design cases.

1.2 Objectives

This course is designed to offer students an overview of the theories, methods and techniques in human-centered analysis. Students are expected to achieve the following.

Course Objective 1: Students are expected to get familiar with the theories related to

human-factor issues, rooted from a broad range of disciplines including environmental psychology, behavior science, environmental neuroscience, human geography, and landscape research.

Course Objective 2: Students are expected to be exposed to the methods or techniques that applied to human centered landscape analysis. A spectrum of methods will be introduced in this course to reveal landscape performance, including but not limited to wearable bio-sensors, eye-tracking and facial expression detections as well as more traditional methods such as behavior observation and behavior & psychology experiment.

Course Objective 3: Students are expected to adopt one or two of the methods or techniques learned in class and work as team on an evaluation project of a specific site.

1.3 GenAI Use Policy

In this course, GenAI tools, such as ChatGPT, MidJourney, and various AI-assisted design platforms, may be used as tools to support thinking and improve efficiency, but they must not replace students as the main agents of design and decision-making. In all teaching and learning activities, the core design logic, site assessment, spatial coordination strategies, and control of planning indicators must be completed independently by students.

Permitted and encouraged uses include: (1) in the preliminary research stage, GenAI may be used to help quickly organize background information related to the site, such as basic literature, policies, regulations, and comparable case studies, but students must independently verify the authenticity and timeliness of the information; (2) in the conceptual design stage, AI may be used to generate reference images or style sketches to break fixed patterns of thinking and support brainstorming; and (3) in improving technical efficiency, GenAI may be used to optimize written expression or assist with basic data visualization.

Strictly prohibited uses include: (1) directly submitting AI-generated text, drawings, analytical diagrams, or planning schemes as final coursework; (2) using AI to fabricate site investigation data, ecological analysis results, or planning indicators; and (3) directly copying spatial layouts or design strategies generated by AI without conducting site-specific adaptation analysis and critical reflection.

For all assignments, including process drafts and final submissions, any use of GenAI tools must be clearly indicated in the drawings and written materials. Students bear full academic and copyright responsibility for all submitted work, including any AI-assisted content.

1.3 Graduation Requirements Fulfilled by the Course

No.	Graduation Requirements	Details of Criteria

No.	Graduation Requirements	Details of Criteria
1-4	Foundation of Computing and Digital Intelligence	Be able to combine digital and intelligent methods and tools such as GIS and remote sensing, spatial data analysis, parametric design, AI-assisted design, and landscape ecological analysis and evaluation, and apply computational thinking to analyze complex engineering problems in landscape architecture.
2-2	Application of Research Methods	Be able to systematically analyze complex engineering problems in landscape architecture along with their multidisciplinary backgrounds and influencing factors through methods such as literature research, information collection and processing, and spatial data analysis.
3-2	Proposal of Innovative Solutions	Be able to propose innovative landscape architecture planning and design strategies, technical pathways, and spatial solutions for specific goals and needs.
4-2	Data Acquisition and Analysis	Be able to use qualitative, quantitative, and digital–intelligent methods to acquire, process, analyze, and interpret data and information in landscape architecture research.
5-2	Analysis, Prediction, and Simulation Tools	Be able to use tools such as GIS and remote sensing, spatial data analysis, parametric design, AI-assisted design, and landscape ecological analysis and evaluation to conduct spatial analysis, prediction, and simulation of complex engineering problems in landscape architecture, thereby supporting design reasoning and decision-making; understand the assumptions, applicable scope, and limitations of these tools, and reasonably evaluate the credibility of simulation and analysis results.
8-2	Multidisciplinary Collaboration and Role Assumption	Be able to collaborate in diverse, multidisciplinary contexts (e.g., architecture, urban and rural planning, ecology, water conservancy, municipal engineering, sociology, management), and assume roles as individuals, team members, or leaders according to team task requirements.
9-2	Cross-Cultural Communication	Possess necessary foreign language application skills and cross-cultural communication awareness; be able to engage in professional communication in cross-cultural contexts, read professional foreign literature, participate in international academic exchanges, and understand and respect linguistic and cultural differences.

1.4 Mapping between Course Objectives and Graduation Requirements

Course Objectives / Graduation Requirements	Objective 1	Objective 2	Objective 3
Foundation of Computing and Digital Intelligence	●		
Application of Research Methods		●	
Proposal of Innovative Solutions			●
Data Acquisition and Analysis		●	
Analysis, Prediction, and Simulation Tools		●	

Course Objectives / Graduation Requirements	**Objective** 1	**Objective** 2	**Objective** 3
Multidisciplinary Collaboration and Role Assumption			●
Cross-Cultural Communication	●	●	●

2.Teaching Contents, Requirements, Framework, Methods

No.	Themes	No.	Contents	Requirements	Teaching Objectives	Teaching Method	Credit Hours	Extracurricular Hours
1	Fundations and Principles	1	Lecture: brief introduction	Course orientation and related basic principle	Obj.1	Lecture	16	8
		2	Lab tour	Exposure to equipment, methods and techniques measuring human factors.	Obj.2	Tour & Lecture		
		3	National Holiday					
		4	Lecture: Affective measures	Principles, methods and examples related to affective measures and physiological responses.	Obj.1&2	Lecture		
		5	Lecture: Attention and Eye-tracking I	Principles, methods and examples related to attention and eye-tracking in natural and urban environments.	Obj.1&2	Lecture		
		6	Lecture: Attention and Eye-tracking II	Principles, methods and examples related to attention and eye-tracking in natural and urban environments.	Obj.1&2	Lecture		
		7	Lecture: Driving	Principles, methods and examples related to driving experience and perfromance.	Obj.1&2	Lecture		
		8	Lecture: Cognition and others	Principles, methods and examples related to cognitive performance and others in natural and urban environments.	Obj.1&2	Lecture		

2	Hands-on Project	9	Workshop: Group project	Master problem framing and solution synthesis.	Obj.3	Workshop	16	8
		10	Workshop: Group project	Master problem framing and solution synthesis.	Obj.3	Workshop		
		11	Lecture: Equipment training	Exposure to a series of human factor measurement methods and techniques	Obj.2	Lecture		
		12	Lab: Group project	Master the basic methods of eye movement experiment measurement and analysis.	Obj.2&3	Lab		
		13	Lab: Group project	Master the basic methods of eye movement experiment measurement and analysis.	Obj.2&3	Lab		
		14	Lab: Group project	Master the basic methods of eye movement experiment measurement and analysis.	Obj.2&3	Lab		
		15	Final Presentation	Master the basic methods of eye movement experiment measurement and analysis.	Obj.2&3	Presentation		
		16	National Holiday					

3.Course Teaching Value

Driven by the cutting-edge development of digital technology, the fourth industrial revolution is profoundly affecting the development of the engineering industry in global scale. The United States, Germany and China have respectively released corresponding strategic plans - "Industrial Internet of Things", "Industry 4.0" and "Made in China 2025". The new technological revolution has put forward new requirements for the education in the field of architecture and engineering. In this context, this course explores the cutting-edge technology of human-centered landscape performance analysis, promotes

diagnosis and performance assessment, which may provide strong supports to realize the evidence-based design in China under the new technology revolution.

4.Assessment, Grading and Requirement of Retaking the Course

Students are expected to complete all assignments and will be graded according to the following scale.

1) Class Attendance: students are required to fully participate in all course lectures and course discussions, accounting for 20%;

2) Team Assignments: students are required to complete two research projects in groups under the guidance of the instructor, and to present and submit the report, accounting for 80% (40% each).

Students who fail to complete the course study should retake the course in accordance to the teaching regulations. The instructor may determine the way of retaking the course (either "retake the full course" or "only re-submitting the assignments") according to the specific situation of the student.

Assessment	Weight	Objectives	Remarks
Class Attendance	20%	Objective 1	students are required to fully participate in all course lectures and course discussions
		Objective 2	
Final Review	80%	Objective 2	students are required to complete a research on a theoretical topic or a project case in groups under the guidance of the instructor, and to present and submit the report at the end of the semester
		Objective 3	

5.Scoring Criteria

5.1 Class Attendance Scoring Criteria

Objectives	Scoring Description				
	100-90	89-80	79-70	69-60	59-0

Objectives 1～2	Full attendance in classes. Excellent performance in course discussions. Answering all the questions from the instructor correctly.	The student has one record of absence in classes. High performance in course discussions. The correct rate of answering the questions from the instructor is not less than 80%.	The student has two records of absence in classes. Good performance in course discussions. The correct rate of answering the questions from the instructor is not less than 70%.	The student has three records of absence in classes. Acceptable performance in course discussions. The correct rate of answering the questions from the instructor is not less than 60%.	The student has four or more records of absence in classes. The performance in course discussions is less than satisfactory. The correct rate of answering the questions from the instructor is below the qualified level.

5.2 Team Assignment Scoring Criteria

Objectives	**Scoring Description**				
	100-90	89-80	79-70	69-60	59-0
Objectives 2～3	The organization and coordination of the team are excellent. The presentation of the final report reflects outstanding achievement in both content and execution, including the summary of the key concepts, the analysis of the research problems, the oral presentation and the responses to the questions from the instructors.	The organization and coordination of the team are good. The presentation of the final report reflects high achievement in both content and execution, including the summary of the key concepts, the analysis of the research problems, the oral presentation and the responses to the questions from the instructors.	The organization and coordination of the team are reasonable. The presentation of the final report fulfills all the requirements in both content and execution, including the summary of the key concepts, the analysis of the research problems, the oral presentation and the responses to the questions from the instructors.	The organization and coordination of the team are acceptable. The presentation of the final report fulfills the basic requirements in both content and execution, including the summary of the key concepts, the analysis of the research problems, the oral presentation and the responses to the questions from the instructors.	The organization and coordination of the team are less than satisfactory. The presentation of the final report does not fulfill the requirements in both content and execution, including the summary of the key concepts, the analysis of the research problems, the oral presentation and the responses to the questions from the instructors.

6.References

Book Title	Authors	Publisher	Edition	ISBN	Textbook Status	Textbook / Main References
Eyetracking the user experience: A practical guide to research	Bojko, A.	Rosenfeld Media	1	9781933820101	Foreign-Language Textbook	Textbook
城市更新的眼动追踪诊断	CHEN, Zheng	Tongji University	1	978-7-0000-0000-0	Self-Compiled Textbook	Textbook

Hatano, G., & Inagaki, K. (1984). Two courses of expertise. *Child development and education in Japan, 6*(3), 27-36. Retrieved from http://hdl.handle.net/2115/25206

Simon, H. A. (1978). Satisficing and the one right way. In R. Kaplan & S. Kaplan (Eds.), *Humanscape : environments for people* (pp. 127-131). N. Scituate, Mass.: Duxbury Press.