Carnegie Mellon University
School of Architecture

48-351 Human Factors in Architecture

This course will explore how human factors influence the design, construction and occupancy of the spaces we create. More specifically, we will consider the relationships between architecture and our bodies and our senses. We will study how the spaces we occupy affect our perception of ourselves and others. We will examine how we respond to the provocations of form and spaces with our behavior and our social relationships. We will also explore how these relationships have influenced the formation of architectural theory.

This course presents concepts in increasing scales—from the body to the urban setting. The coursework will sensitize you to issues, expand your understanding of the topics, and develop skills that you can implement in your projects. Most importantly, it is hoped that the themes of this course will influence the direction and decisions of your future practice.

The objectives include:

Students will be able to identify and experience the physiological relationships between architecture and the human body in such concepts as universal design and sensory experience. Students should comprehend and synthesize the relationship between form and space and human perception.

Students will be introduced to fundamental concepts of positive theory in environmental design. This will include ways of observing and measuring behavior and the cognitive processes that affect behavior as well as group behavioral theory and social organization in the built environment.

Students will explore the relationships between positive theory in environmental design and the formation of values into normative and aesthetic theory.

Students will evidence their understanding of these concepts through application in class projects and synthesis in their concurrent studio work.

We shape our buildings; thereafter they shape us
Winston Churchill, 1943

We will approach these themes with a series of lectures, class discussion, readings, guest speakers and field studies. Assignments will consist of field observations, in class projects, reading analyses, exams and a research paper. Much of the material is based on **Creating Architectural Theory** by Jon Lang, but, as it is out of print, the required reading from this text will be available through e-reserves through the Cameo system. There will also be a number of topical readings that will be available from Cameo. Lectures may or may not be available via Blackboard, so you are expected to take copious notes. Assignments and other course documents will be available via Blackboard. You are responsible for all material. Reading and further investigation into the concepts presented in lectures are required.

Spring 2008 | HH B131
Instructor Christine Mondor
TAs Leah Wolkovich | Christian Wagner

Winston Churchill spoke of the old House of Commons which was destroyed in WWII. When it was rebuilt in 1950, it remained of insufficient size to seat all its members. Churchill was against "giving each member a desk to sit at and a lid to bang" because it would fill beyond capacity, with members spilling out into the aisles, creating in his view a suitable "sense of crowd and urgency."

Your performance will be measured through group work, individual work and exams. They will be weighted as follows: Assignments (readings & projects) 20%, Journal 20%, Exams (midsemester & final) 25%, Paper|Presentation|Poster 30%, Participation 5%.

The assignments in this class are designed to present concepts of increasing complexity. Some projects, such as the field journal, are intended to be a constant measure of your progress, observations and insights throughout the different topics of the class. Other assignments will be designed to give you specific skills or knowledge to be applied in your design work now and in the future. You are encouraged to keep track of your progress through the Blackboard system and to ask for help as you need it.

The course requires time to be spent out of class on an ongoing basis. In some cases it may be for an individual field observation or for a group field visit. You are expected to attend all field studies scheduled for class time. If you are unable to do so, please contact me in advance. The designated carpool meeting place is at the UC circle at 30 minutes before class begins or as announced. Maps will be available for your use.

Teaching Assistants are available during the semester. TA availability before tests or projects will be limited given the size of the class, so you are encouraged to access your TA throughout the semester. Office hours will be announced.

The schedule and list of topics follows. Readings and assignments will be distributed in class. You are expected to be in attendance at all lectures and classes. The instructor must be notified in advance of any absences when possible and an official medical excuse may be requested. Final grades may be dropped by one GPA point when absences are in excess of two.

Behavioral Sciences and Design	15 Jan	Tu	lecture
	17 Jan	Th	discussion w/ guest
The Human Dimension	22 Jan	Tu	lecture
	24 Jan	Th	guest
	29 Jan	Tu	discussion (7pm only, location TBA)
The Cognitive Dimension	31 Jan	Th	lecture
	7 Feb	Tu	guest
	9 Feb	Th	discussion
The Environmental Dimension	12 Feb	Tu	lecture
	14 Feb	Th	guest
	19 Feb	Tu	discussion
The Behavioral Dimension	21 Feb	Th	lecture
	26 Feb	Tu	guest
	28 Feb	Th	discussion
Student Conferences	4 Mar	Tu	meet w/ instructor
	6 Mar	Th	meet w/ instructor
SPRING BREAK	11 Mar	Tu	no class
SPRING BREAK	13 Mar	Th	no class
Case Studies	18 Mar	Tu	field visit
	20 Mar	Th	field visit
The Social Dimension	25 Mar	Tu	lecture
	27 Mar	Th	guest
	1 Apr	Tu	discussion
The Community Dimension	3 Apr	Th	lecture
	8 Apr	Tu	guest
	10 Apr	Th	discussion
Values in Architecture	15 Apr	Tu	lecture/discussion
SPRING CARNIVAL	17 Apr	Th	no class
Student Presentations	22 Apr	Tu	individual presentations
	24 Apr	Th	individual presentations
	29 Apr	Tu	individual presentations
	1 May	Th	individual presentations/poster session

No projects will be accepted late. Electronic files that were rejected by the Blackboard drop box should be submitted to the TA emails. Projects must be presented on time or in advance of an absence. No late projects will be accepted without attestation of absence. Absences from exams will be accepted only if warranted by illness or other problem and attested to by evidence such as a doctor's excuse or other authority acceptable to the instructor. Makeup examinations may be given depending on proctor availability or an oral exam may be given.

Plagiarism, cheating and disrespect for the work of others will not be tolerated in this course. Individuals caught engaging in any of these activities will be penalized per the University policy, which may include grade penalty, failure of the course or expulsion from the university, depending on the severity of the infraction.

During lectures or other presentations, there is no use of cell phones, computers or any other sound emitting or electronic device except as needed for the assignment. There should be no audible equipment in studio during class time.

For the purpose of reporting a final grade to the Registrar, the instructors will use the university's classification system. Qualifications for grades are as listed below:

A:: Performance of superior quality; intellectually, formally and technically. There is clear evidence of genuine talent and architectural insight. Reserved for work that evidences the course goals in a professional and timely manner.

B:: Performance of good quality that has aesthetic merit and technical competence, although some problems are noted. Work reflects a solid commitment to the learning process and an understanding of the issues.

C:: Performance of acceptable quality that meets the basic goals of the exercise, is presented in a complete manner and does not contain serious errors of judgment or omission.

D:: Performance of inferior quality that may reflect a conscientious effort on the part of the student, but contains many serious errors of judgment, lacks aesthetic skill and/or is incomplete in presentation. The work did not meet the instructional goals in several areas.

R:: Performance that is seriously deficient in merit and effort. Given to those projects that reflect a lack of class attendance, significant incompleteness and/or lack of interest in the subject material

The Readings below form the foundational core of the class and contain information for which you will be responsible. These readings are not required but highly recommended. Required Readings will be assigned per the topics below.

Behavioral Sciences and Design	Lang, Chapter 2: The Nature and Utility of Theory Lang, Chapter 3: The Behavioral Sciences and Architectural Theory
The Human Dimension	Lang, Chapter 12: Anthropometrics and Ergonomics
The Cognitive Dimension	Lang, Chapter 9: Fundamental Processes of Human Behavior Lang, Chapter 13: Cognitive Maps and Spatial Behavior
The Environmental Dimension	Lang, Chapter 8: The Nature of the Environment Lang, Chapter 10: The Built Environment and Human Behavior
The Behavioral Dimension	Lang, Chapter 11: The Behavior Setting: a unity for environmental analysis and design
The Social Dimension	Lang, Chapter 14: Privacy, Territoriality, and Personal Space—Proxemic theory Lang, Chapter 15: Social Interaction and the Built Environment
The Community Dimension	Lang, Chapter 15: Social Organization and the Built Environment
Values in Architecture	Lang, Chapter 18: Formal Aesthetics Lang, Chapter 19: Symbolic Aesthetics Lang, Chapter 20: Understanding Normative Theories of Environmental Design

In adddition to the Lang readings and other assigned readings, the following texts are recommended in their entirety:

Universal Principles of Design. Lidwell | Holder | Butler
A cross disciplinary look at principles of perception, helping people learn, usability, appeal, and design process and user interface that has much relevance to space making. The book is well designed and easy to read, giving an introduction to relevant research.

Culture, Architecture and Design. Amos Rappoport
This important text expolores the relationships that we form with our environment through psychological and cultural ties, the ways our environments affect us and the how to engage cultural theory in design.

Space and Place: The Perspective of Experience. Yi-Fu Tuan
A classic text in human geography, exploring how we experience and think about space and form attachments to place or topophilia. He describes different types of space including mythical space, architectural space and experiential space and how we relate to each other within them.

The Poetics of Space. Gaston Bachelard
Bachelard probes the relationships we establish with domestic space, saying that,"Inhabited space transcends geometrical space." He looks at the physical and cognitive relationship with spaces--how we remember them and how we represent them and how they become more than mere stage settings for our actions.

Inquiry by Design. John Ziesel
This text includes information on behavioral science methods and practices that are useful for architects and designers. It focuses on the design process and creativity and lays out practical ways of observation, surveys, and reading the built environment.

The Structure of the Ordinary, N. J. Habraken
Habraken explored the reciprocal relationship between people and their environment, focused on physical, biological and social domains within the urban setting. The role of the "ordinary" is explored relative to place making and cultural meaning.

Kinship to Mastery: Biophilia in Human Evolution and Development. Stephen Kellert
Biophilia has recently been in professional and popular media as a way to describe out attachment and connection to natural forms, spaces and processes. Kellert is an expert on the topic, articulating how we make connections and why those connections are critical to a sustainable relationship with our environment.

A Pattern Language. Christopher Alexander, Sara Ishikawa and Murray Silverstein
A classic tome written on the premise that there are certain behavior patterns and tendencies that are shared across cultures and can be used to inform design without being predictive of form or language. Moves from the urban scale to the detail level.

Design and Cultural Responsibility. Jack Williamson

A compilation of essays in the cultural connections between people and place and social responsibility in architecture, landscape and design.

Other resources

Defensible Space. Oscar Newman

The Social Life of Small Urban Spaces. William Whyte

The Death and Life of Great American Cities. Jane Jacobs