CA3177: ARCHITECTURAL SPATIAL ANALYSIS

Effective Term
Semester A 2022/23

Part I Course Overview

Course Title
Architectural Spatial Analysis

Subject Code
CA - Civil and Architectural Engineering
Course Number
3177

Academic Unit
Architecture and Civil Engineering (CA)

College/School
College of Engineering (EG)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
SE3001 Architectural Spatial Analysis

Exclusive Courses
Nil

Part II Course Details

Abstract

The course aims at developing student's understanding of the key concepts of space syntax and the application of its various methods to analyse the spatial configurations and visual field characteristics of architectural and urban layouts.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Explain the key concepts of space syntax and their development.		x		
2	Evaluate the main spatial properties - connectivity, integration, intelligibility, etc. - of the built environment and explore their impact on user behaviour.			x	
3	Evaluate the main visual field/isovist characteristics - compactness, occlusivity, clustering coefficient, etc. - of the built environment and explore their impact on user behaviour.			x	
4	Analyse architectural and urban layouts using space syntax methods - convex analysis, justified graph, axial analysis and visibility graph analysis.			x	

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Teaching and Learning Activities (TLAs)

	TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Consists of oral presentations by instructors intended to present information on a particular subject. Other forms of teaching and learning activities will also be used to stimulate students' participation during a lecture.	1, 2, 3	

2	Workshop	Activity complementary to the lecture classes to provide more opportunities for student-instructor and student-student interaction. Students will be engaged in hands-on exercises to practice tools learned.	2, 3, 4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Assignment 1	1, 2, 3, 4	25	
2	Assignment 2 (In-class quiz)	1, 2, 3, 4	20	
3	Assignment 3	1, 2, 3, 4	30	

Continuous Assessment (%)

75

Examination (%)

25

Examination Duration (Hours)

1.5

Additional Information for ATs

To pass a course, a student must obtain minimum marks of 30% in both coursework and examination components, and an overall mark of at least 40%.

Assessment Rubrics (AR)

Assessment Task

Assignment 1

Criterion

Comprehensive evaluation of the main spatial properties - connectivity, integration, intelligibility, etc. - of the built environment and thorough exploration of their impact on user behaviour. Demonstration of a clear understanding of the tools used.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal level

Assessment Task

Assignment 2 (In-class quiz)

Criterion

Comprehensive evaluation of the main spatial properties - connectivity, integration, intelligibility, etc. - of the built environment and thorough exploration of their impact on user behaviour. Demonstration of a clear understanding of the tools used.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal level

Assessment Task

Assignment 3

Criterion

Comprehensive evaluation of the main spatial properties - connectivity, integration, intelligibility, etc. - of the built environment and thorough exploration of their impact on user behaviour. Demonstration of a clear understanding of the tools used.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal level

Assessment Task

Examination

Criterion

Comprehensive evaluation of the main spatial and visual properties of the built environment and thorough exploration of their impact on user behaviour. Demonstration of a clear understanding of the tools used.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal level

Part III Other Information

Keyword Syllabus

Space syntax; spatial configurations; connectivity; integration; intelligibility; axial analysis; convex space; justified graph; spatial typology; isovist; visibility graph analysis; compactness; occlusivity; clustering coefficient.

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	Batty, M. (2001). "Exploring isovist fields: space and shape in architectural and urban morphology," Environment and Planning B: Planning and Design 28, 123-150.
2	Benedikt, M. L. (1979). "To take hold of space: isovists and isovist fields," Environment and Planning B: Planning and Design 6, 47-65.
3	Hanson, J. (1998). Decoding Homes and Houses. Cambridge: Cambridge University Press.
4	Hillier, B. (1996). Space is the machine: A configurational theory of architecture. Cambridge: Cambridge University Press.
5	Hillier, B. (2005). "The art of place and the science of space," in World Architecture, 11/2005 185, Beijing, Special Issue on Space Syntax, 96-102.
6	Hillier, B. & Hanson, J. (1984). The social logic of space. Cambridge: Cambridge University Press.
7	Hillier, B and Tzortzi, K. (2006). "Space syntax: The language of museum space," in Macdonald, S. (Ed.), A Companion to museum studies. Oxford: Blackwell Publishing, Blackwell Reference Online.
8	Steadman, P. (1983). Architectural morphology: An introduction to the geometry of building plans. London: Pion.
9	Turner, A., Doxa, M., O'Sullivan, D. & Penn, A. (2001). "From isovists to visibility graphs: A methodology for the analysis of architectural space," Environment and Planning B: Planning and Design 28, 103-121.