

Faculty: Architecture**Department:** Architecture**Course Code & Number:** ARCH 372**Course Title:** Building Technologies in Architecture**Type of Course:** Compulsory**Semester:** Spring**Course Credit Hours:** (3+0+0) 3 / 5 ECTS**Pre-requisite:** ARCH301**Language of Instruction:** English**Mode of Delivery:** Face-to-face

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CATALOG DESCRIPTION

Building technologies. Materials used in buildings. Technologies of sustainability. Environmental forces and performances of built structures. Universal Design Principles and accessibility. Architectural detailing.

COURSE OBJECTIVE

The course provides knowledge on building technologies and materials used in buildings. Effects of environmental forces and performances of built structures, structural and service systems and building materials are put under analysis. Architectural system detailing.

LEARNING OUTCOMES

Upon successful completion of this course, a student will be able to

1. analyse different construction systems and structural behaviour of building materials
2. analyse environmental forces that affect the construction methodologies and building materials
3. differentiate and compare physical and mechanical properties of different building materials
4. correlate building technologies and their design implications
5. design architectural system details
6. define the environmental design problems with reference to Universal Design Principles
7. create appropriate and integrated design solutions to make the built environment be equally usable for all people with different abilities

EVALUATION

Assignment-1 (GW):	20%
Assignment-2 (IW):	20%
Assignment-3 (IW):	20%
Final Assignment (IW):	35%
Attendance & Contribution:	5%

GRADING SYSTEM

For each course taken, the student is given one of the following grades by the course teacher. The letter grades, coefficients and percentage equivalents are given below.

AA	4.0 / 100-90
BA	3.5 / 89-85
BB	3.0 / 84-80
CB	2.5 / 79-75
CC	2.0 / 74-70 average
DC	1.5 / 69-60
DD	1.0 / 59-50 unsatisfactory
F	0.0 / 49-0 fails to follow requirements of the assignment
FX	0

EXAMS and PRESENTATIONS

All assignments are due at the date and time indicated. Late assignments if otherwise accepted will be downgraded. Incomplete work is generally discouraged. The assignments are considered to be mid-term exams. In order to be eligible for submitting the final, students should at least submit 2 of the 3 assignments stated in the syllabus. Not submitting more than one assignment or not submitting the final assignment will result in FX.

LANGUAGE

The class discussions and all of your presentations will be in English. Developing your verbal language skills will be very important in acquiring the disciplinary terminology as well as daily communication at the class.

COURSE CONDUCT

Good academic conduct requires respect for the rights of others in the collective experience of learning, either in the class or elsewhere; responsibility towards others and sincere and honest engagement in group works; avoidance of cheating; and last but not the least, **avoidance of plagiarism**, which is using others' works, ideas, findings or products as if one's own.

ATTENDANCE

Attendance to course and to student presentations are obligatory. Absence above 40% of the course hours results in failing.

RECOMMENDED SOURCES

- Allen, Edward. *How Buildings Work*, Oxford, N.Y.: Oxford Uni. Press, 2005.
- Alread, Jason. *Design-Tech: Building Science for Architects*, Routledge, London: 2014.
- Bere, Justin, *An Introduction to Passive House: Building for the Future*, RIBA Enterprises, London: 2014.
- Bovill, Carl. *Sustainability in Architecture and Urban Design*, Routledge, London: 2014.
- Cavanaugh, William J. *Architectural Acoustics: Principles and Practice*, John Wiley & Sons Ltd, Chichester: 2010.
- Easterling, Keller, *Extrastatecraft: The Power of Infrastructure Space*, Verso Books, London: 2014.
- Fontana-Giusti, Gordana. *Designing Cities for People: Social, Environmental and Psychological Sustainability*, Earthscan Ltd, London: 2009.
- Fortmeyer, Russell, *Kinetic Architecture: Designs for Active Envelopes*, Images Publishing Group Pty Ltd, Mulgrave, Victoria: 2014.
- Friedman, Avi. *Innovative Houses: Concepts for Sustainable Living*, Laurence King Publishing, London: 2013.
- "Future Details of Architecture", *AD Architectural Design*, Volume 84, Issue 4, July/August 2014.
- Guzowski, Mary. *Towards Zero-Energy Architecture: New Solar Design*, Laurence King Publishing, London: 2012.
- Griffiths, Alyn, *21st Century Lighting Design*, Bloomsbury Visual Arts, London: 2014.
- Gruber, Petra. *Biomimetics in Architecture: Architecture of Life and Buildings*, Walter de Gruyter & Co, Berlin : 2010.
- "High Definition: Zero Tolerance in Design and Production", *AD Architectural Design*, Volume 84, Issue 1, January/February 2014.
- Kara, Hanif and Andreas Georgoulas ed. *Interdisciplinary Design: New Lessons from Architecture and Engineering*, Actar-Harvard Graduate School of Design, New York: 2012.
- Karlen, Mark. *Lighting Design Basics*, John Wiley & Sons Ltd, Chichester: 2012.
- Kopec, Dak. *Environmental Psychology for Design*, Fairchild Books, London: 2012.
- "Material Computation: Higher Integration in Morphogenetic Design", *AD Architectural Design*, Volume 82, Issue 2, March/April 2012.
- McLean, Will. *Introduction to Architectural Technology* (Second Edition), Laurence King: 2013.
- Meek, Christopher, *Daylighting and Integrated Lighting Design*, Routledge, London: 2014.
- Novak, Marcos. "Neuro-, Nano-, Bio-: New Atomism and Living Nanotectonics", In *New Architecture: Essays on Architecture*, ed. by Sheila de Vallée, London: Papadakis Publisher, 2007, pp.:177-185.
- Nussbaumer, Linda L. *Inclusive Design: A Universal Need*, Fairchild Books, London: 2012.
- Plummer, Henry. *The Architecture of Natural Light*, Thames & Hudson Ltd, London: 2013.
- Steinfeld, Edward. *Universal Design: Creating Inclusive Environments*, John Wiley & Sons Ltd, Chichester: 2012.
- Szokolay, Steven V. *Introduction to Architectural Science: The Basis of Sustainable Design*, Routledge, London: 2014.
- Winchip, Susan M. *Fundamentals of Lighting*, Fairchild Books, London: 2011.
- Yu, Mayine L., *Skins, Envelopes and Enclosures: Concepts for Designing Building Exteriors*, Routledge, London: 2013.

TENTATIVE TIMETABLE

WEEK1 / Feb 17	Introduction to Syllabus
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MODULE 1

WEEK2 / Feb 24	Building as a System: Building Science Concepts
WEEK3 / Mar 2	Building as a System: Thermal Aspects
WEEK4 / Mar 9	Building as a System: Lighting Aspects
WEEK5 / Mar 16	Building as a System: Acoustic Aspects

Submission	Assignment-1 // Group work // (Feb 24-Mar 22)
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MODULE 2

WEEK6 / Mar 23	Accessibility: Universal Design
WEEK7 / Mar 30	Accessibility: Standards and Details

Submission	Assignment-2 // Individual work // (Mar 23-Apr 5)
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MODULE 3

WEEK8 / Apr 6	Themes in Building Technologies: Sustainability and Green Building
WEEK9 / Apr 13	Themes in Building Technologies: Adaptive and Dynamic Skins
WEEK10 / Apr 20	Themes in Building Technologies: New Materials and Innovative Structures

Submission	Assignment-3 // Individual work // (April 6-May 3)
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MODULE 4

WEEK11 / Apr 27	System Detail Design: Designing the Detail
WEEK12 / May 4	System Detail Design: Construction Methods
WEEK13 / May 11	System Detail Design: Building Elements
WEEK14 / May 18	System Detail Design: Detail Patterns

Submission	Final Assignment: System Detail Design // Individual work // (May 4-TBD)
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