



Module Specification

Technology 6 - Smart Materials

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Part 1: Information

Module title: Technology 6 - Smart Materials

Module code: UBLMXP-8-M

Level: Level 7

For implementation from: 2023-24

UWE credit rating: 8

ECTS credit rating: 4

College: Faculty of Environment & Technology

School: FET Dept of Architecture & Built Environ

Partner institutions: None

Field: Architecture and the Built Environment

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: To critically introduce the students to the newly invented materials and technologies and their implications on architecture as seen through applied situations and case studies globally.

Features: CSA code ARCH/TECH 2721

Educational aims: See Learning Outcomes.

Outline syllabus: The module will contribute to students' critical knowledge and understanding of:

THE USE OF SMART MATERIALS AND TECHNOLOGY IN ARCHITECTURE

The module will have guest lecturers and specialists introducing some of the following areas to the students:

Introduction to the role of research and newly invented materials and technologies and their implications on architecture.

Applications of new materials and technologies as seen through applied situations and case studies.

Advanced technologies of conventional materials - wood, glass, steel and concrete and related technologies, physical and chemical properties, advantages and disadvantages and applications in building design.

Polymers and related technologies and their use in buildings: ETFE, PTFE, GRP etc. Physical and chemical properties, advantages and disadvantages.

Sustainable materials and technologies.

Smart materials such as nano materials, new textiles, interactive membranes and their use in buildings and the building envelope. Physical and chemical properties, advantages and disadvantages of use.

Digital materiality of architecture: new media facades.

CAD/CAM prototyping technologies.

Time based architecture: cybernetics, interactive design, tangible interfaces, wearable technologies.

Part 3: Teaching and learning methods

Teaching and learning methods: See Assessment.

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

A1 of the properties, including critical understanding of their advantages and disadvantages as well as its applications of new polymers: ETFE,PTFE, GRP etc.

A2 of the properties, including critical understanding of their advantages and disadvantages and applications of smart materials and smart technology.

A3 of the properties, including critical understanding of their advantages and disadvantages and applications of digital materials and digital technologies.

A4 of the properties, including critical understanding of their advantages and disadvantages of cybernetics and time based technologies.

A5 of the advantages and applications of sustainable materials and technologies in buildings.

A6 of the properties of advanced technologies as applicable to conventional materials such as wood, glass, steel and concrete. And evaluate their advantages and disadvantages..

MO1 Critical Awareness:

of the innovative concepts in materials and building technologies that are integrated in building design globally.

MO2 Critical Understanding:

of the use and integration of new materials and technologies in architecture and related construction details, construction processes, maintenance and cost implications.

MO3 Critical Understanding :

of the potential opportunities for design innovation through the use of smart materials and advanced technologies.

MO4 Ability:

to integrate the understanding of Smart materials, process of assembly and maintenance aspects in the design of middle and high rise buildings and complex of buildings for different usages in different situational contexts.

Hours to be allocated: 80

Contact hours:

Independent study/self-guided study = 27 hours

Face-to-face learning = 53 hours

Total = 80

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/index.html) via the following link <https://uwe.rl.talis.com/index.html>

Part 4: Assessment**Assessment strategy:** Strategy:

Being a technical module where students are required to demonstrate key analytical and problem solving skills. The coursework requires the students to critically demonstrate, throughout the academic year, that they understand how these smart materials concepts introduced in the lectures will and can be applied in practice (CW).

The coursework is used to integrate strands of critical knowledge presented as separate topics and to develop students' academic writing with particular emphasis being placed on the managing and referencing of evidence based work.

Formative Feedback will be given to drafts of the coursework and to the final coursework piece prior to submission.

Assessment tasks:

Written Assignment (First Sit)

Description: Individual written coursework submission which will cover smart materials and advanced technologies

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: A1, A2, A3, A4, A5, A6, MO1, MO2, MO3, MO4

Written Assignment (Resit)

Description: Resubmission of Written Submission

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested:

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Architecture and Environmental Design [SriLanka] MArch 2022-23