Module code	ARC402			**Level**	4
Module title	Material Investigation: Environmental and Technical Principles				
Status	Core				
Teaching Period	Autumn				
Courses on which the module is taught	BA (Hons) Architecture				
Prerequisite modules	None				
Notional learning hours	100	**Credit value**	10	**ECTS Credits**	5
Field trips?	This module includes compulsory study trips and site visits within London. Students are responsible for local travel costs; most exhibition entrance fees and other activities will be covered by the course.				
Additional costs	Students must purchase essential materials and equipment, including sketchbooks, journals, drawing tools, and model-making supplies. Basic model-making resources will be provided in limited quantities; students are encouraged to source additional materials independently.				
Content notes	None				

1. Module description

Material Investigation: Environmental and Technical Principles runs in parallel with your Design: Spatial Investigations project in Term 1 introducing you to the environmental and technological principles that underpin architectural design. The module explores how sustainability and technology inform the design process, from concept to detailed resolution, by examining how buildings respond to environmental, social, and material conditions. You will analyse and interpret the environmental, economic, and social factors of a site and programme to develop contextually responsive and sustainable design strategies.

Through research, analysis, and experimentation, you will investigate environmental design principles, material performance, and environmental control strategies that enhance architectural quality and human comfort. You will learn to apply this knowledge to your design work, developing technically informed and environmentally responsible proposals. The module links theory and practice through case studies, technical drawings, environmental simulations, and material investigations.

2. Learning Outcomes

Upon successful completion of this module, you will be able to:

Digital Data and Tools (MLO 06)
Use digital and analogue methods to analyse, represent, and test environmental and technical aspects of architectural design in familiar and well-defined contexts.

Discipline Knowledge (MLO 07)
Explain fundamental environmental and technical principles, such as structure, materials, and sustainability, and describe how they relate to your design project.

Human and Environmental Impact (MLO 10)
Explore the environmental and social impact of architectural design proposals, identifying strategies that promote environmental responsibility and occupant comfort.

3. Learning and teaching methods, and reasonable adjustments

This module adopts an active-learning approach that integrates environmental and technical knowledge into the design process. Each week, you will engage in a variety of CAD lab and workshop-based activities that connect theory with practical application. You will undertake environmental site analysis, material testing, and exploring how environmental strategies shape architecture.

Learning is supported through micro-lectures, case studies, and collaborative discussions, alongside independent directed research that connects to your Design – Spatial Investigations project. You will receive ongoing feedback through tutorials and interim reviews, helping you to apply environmental and technical principles directly to your design work.

Theoretical enquiry is explicitly connected to physical model making as a core working method within this module. You will develop proposals through iterative cycles of drawing, physical modelling and digital production, using models as active tools to test spatial, structural, material and environmental ideas. Where appropriate, work extends into 1:1 prototyping, enabling you to explore form, joint and junction, tolerances and buildability as part of the design process.

Collaborative activities are incorporated within the module through shared discussions, group-based exercises, and peer engagement, enabling you to test ideas collectively, share perspectives, and support your individual learning.

Learning hours			**100**
Directed learning			36
Workshops/ classes	Supervision	Studio time	Other
36			
Guided/Self-guided learning			64

Students seeking reasonable adjustments should consult the current Disability Policy: https://www.regents.ac.uk/policies

4. Assessments and weighting, reasonable adjustment, and feedback methods

Assessment component 1: Report (100%)
Indicative effort: 1200 words ±10% or 12 pages at A3 or equivalent.

You will produce a comprehensive illustrated report analysing the environmental and technical aspects of your Design – Spatial Investigations design project. The report should demonstrate how sustainable design principles and environmental control strategies inform and enhance architectural design decisions. It should include diagrams, drawings, material tests, 3D models and other supporting evidence that connect theoretical understanding with design application.

Mapping of assessment tasks:

Assessment components	**MLO6**	**MLO7**	**ML10**	
Report	X	X	X	

The above assessment component is summative. Students will have the opportunity for formative assessment and feedback before each summative assessment.

5. Indicative resources

Hegger, M., Fuchs, M., Stark, T. and Zeumer, M. (2008) *Energy Manual: Sustainable Architecture*. Munchen: Birkhäuser.

Lechner, N. (2021) *Heating, Cooling, Lighting: Sustainable Design Methods for Architects*. 5th edn. Hoboken, NJ: Wiley.

Mostafavi, M. & Doherty, G. (2010). *Ecological Urbanism*. Lars Müller Publishers.
Smith, P. F. (2016). *Architecture in a Climate of Change: A Guide to Sustainable Design*. 2nd ed. Routledge.

McLean, W. and Silver, P. (2021) *Environmental Design Sourcebook: Innovative Ideas for a Sustainable Built Environment*. London: RIBA Publishing and Routledge.

Pelsmakers, S. and Newman, N. (eds.) (2021) *Everything Needs to Change: Architecture and the Climate Emergency*. London: RIBA Publishing.

Szokolay, S. V. and Baruch, P. (2014) *Introduction to Architectural Science: The Basis of Sustainable Design*. 3rd edn. Abingdon: Routledge. (Available as eBook)

Journals and other sources:

AA Files
Architectural Design
Detail

McLean, W. (2025) *Sustainable & Regenerative Materials for Architecture: A Sourcebook*. Open access via Westminster Research.

Trans Tech Publications (2022) *Sustainable Architecture*. Available at: https://www.scientific.net