Architectural Association
School of Architecture

AA PROGRAMME GUIDE

MASTER OF SCIENCE (MSc)

2025–2026

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SECTION 1: THE SCHOOL
ARCHITECTURAL ASSOCIATION SCHOOL OF ARCHITECTURE

1.1 THIS GUIDE / WHERE WE ARE

The purpose of this Programme Guide is to provide information regarding the way in which the School and its programmes are organised. It also provides an introduction to terms and definitions, common principles of content and assessment, the way that the programmes are structured, how each Course is organised, credited, and regulated, and what you will be expected to do.

Other documents you will find essential in orienting yourself within the School include the following:

- The AA School Academic Regulations
- The AA School Quality Manual
- The Programme Handbook

Our principal buildings, where most of the academic programmes are based, are at 32-39 Bedford Square, 4 and 16 Morwell Street and 1 and 1A Montague Street in Bloomsbury, Central London. The Design and Make Programme is located in AA's Hooke Park, in Dorset.

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1.2 ACADEMIC ORGANISATION AND MANAGEMENT

Overall Academic Organisation

The AA School of Architecture is an independent school governed by the Architectural Association (Inc.). It consists of c. 900 full-time students, who study in the Foundation, Intermediate, Diploma and Postgraduate programmes. The AA School is made-up of four distinct parts:

- A one-year Foundation Programme for students contemplating a career in architecture or related arts subjects. The Foundation Award in Architecture, Art and Design is separate to and does not form part of the 5-year full-time course in architecture.

- The Intermediate and Diploma Programmes offering the 5-year full-time course in architecture:
  - The AA Intermediate Programme leading to the Bachelor of Arts (Honours) and providing exemption from ARB/RIBA Part 1 after 3 years of full-time study (please note that students that complete the programme after June 2027 will receive RIBA Part 1 only);
  - The AA Diploma Programme leading to the Master of Architecture (MArch) and providing exemption from ARB/RIBA Part 2 after 2 years of full-time study.

- The postgraduate programmes comprising 11 distinct programmes of advanced full-time and part-time studies:
  - 10 taught Master level programmes (PGDip/MA/MSc/MArch/MFA/Taught MPhil)
  - A PhD degree. The AA is an Affiliated Research Centre (ARC) of the OU for the delivery and validation of the PhD degree.

- The AA Professional Practice and Practical Experience Examination leading to exemption from the ARB/RIBA Part 3 Examination, the entry requirement to professional registration as an architect. The course and examination are open to anyone who has successfully obtained their Part 1 and Part 2 qualifications (or equivalency from overseas schools of architecture) and also to qualified practitioners for the purpose of Continuing Professional Development.

Enhancing Quality of Learning: Reviews and Monitoring

All programmes in the AA School are subject to systematic internal and external review on a regular basis. This includes review by the School’s Academic Committee and Board (see details below), annual monitoring and periodic review for each programme, annual feedback from External Examiners, student feedback as well as annual and periodic review from the School’s professional bodies and validation partners the Open University, ARB and RIBA.

Academic Governance

The Academic Board (AB) is the sovereign academic body charged with responsibility for the academic governance of the AA School and its programmes of study. It is chaired by the Director of the AA School. The Academic Board delegates responsibilities to, and monitors the progress, effectiveness and recommendations of the AA School’s Academic Committee (AC). The Academic Board demonstrates its accountability to the AA Council by submission of quarterly reports and an annual report.

SECTION 2: DEGREE SPECIFICATION

2.1 MSc DEGREE SUMMARY INFORMATION

Awarding body	Architectural Association School of Architecture	
Partner institution(s)	N/A	
Location of Study/campus	36 Bedford Square, London WC1B 3ES Except for Design and Make located at: Hooke Park, Beaminster, Dorset DT8 3PH	
Professional, Statutory and Regulatory Bodies	Office for Students / QAA	
Award and titles	**Award**	**Title**
Final award	Master of Science (MSc)	MSc in Design and Make MSc in Emergent Technologies and Design MSc in Landscape Urbanism MSc in Sustainable Environmental Design
Credits	180	
Intermediate Award	N/A	
FHEQ Level	7	
	Duration of study (standard)	**Maximum registration period**
Full-time	12 months (4 terms)	24 months
Sandwich	N/A	N/A
Part Time	N/A	N/A
Distance	N/A	N/A
Start date for programme	September 2025	
Course codes/categories		
UCAS code	N/A	
CATS points for course	N/A	
QAA Subject Benchmark	Architecture 2020	
Admissions agency		
UCAS	N/A	
Direct to School	✓	
Admissions criteria		
Requirements	Refer to AA School Academic Regulations	
Language	Refer to AA School Academic Regulations	
Contacts		
School Registrar	Belinda Flaherty	
Programme Heads	Kate Davies and Emmanuel Vercruysse (Design and Make) Milad Showkatbakhsh (Emergent Technologies and Design) Jose Alfredo Ramirez and Eduardo Rico Carranza (Landscape Urbanism) Paula Cadima (Sustainable Environmental Design)	
Examination and Assessment		
External Examiners 2024-2025	Sheryl Boyle, Kai Strehlke (Design and Make) Sean Hanna, TBC (Emergent Technologies and Design) Luis Callejas, Billy Fleming (Landscape Urbanism) Irene Gallou, Rosa Schiano-Phan (Sustainable Environmental Design)	
Examination Board(s)	External Examiners, Programme Heads, School Director, Head of Teaching (Chair), Head of Learning, School Registrar (Administrator)	

Approval/review dates	Approval date	Review date
Programme Specification Validation	May 2020. Revalidated July 2024	Revalidation: July 2029

2.2 MSc PROGRAMME STRUCTURE

MSc programmes are delivered over a 12-month period (September to September) consisting of two taught terms and a third and fourth term for the completion of studies.

MSc awards consist of 180 credits at FHEQ Level 7, each credit equating to approximately 10 learning hours. The credits are split between different modules of varying credit values and submissions.

2.3 DEGREE CREDIT FRAMEWORK

GENERAL MSc CREDIT FRAMEWORK **12 months – 180 Credits**	
Core Studio / Thesis	100 credits
Core Module 1	20 credits
Core Module 2	20 credits
Core Module 3	20 credits
Core Module 4	20 credits
	180 credits
For programme specific credit frameworks please refer to the programme pages below	

2.4 TEACHING, LEARNING AND ASSESSMENT

Teaching and Learning

The first three academic terms of taught courses for MSc programmes consist of lectures, workshops, seminars and writing workshops, with submissions required for each module. The fourth term is devoted to the individual work needed to complete the studies.

Evaluating and Improving Quality/Quality Indicators

AA Academic Committee / Academic Board	Annual Monitoring Reports are submitted to the Academic Committee each September, reflecting on examiner reports, student and staff feedback, and student progression and achievement data. The Academic Committee then reports findings to the Academic Board. Refer to AA School Quality Manual for further detail.
Professional Accreditation and Validation	Revalidation for the MSc takes place every 5 years Next revalidation: July 2029 Refer to AA School Quality Manual for further detail

Assessment

All submissions are assessed and marked by two or more members of the programme’s regular academic staff and confirmed by the Internal Assessment Board. Marks and feedback are provided to students within 15 working days/3 weeks of initial submission. This timeframe is not inclusive of closure weeks. In exceptional circumstances where this timeframe is not met, students will be informed of when marks and feedback will be released at the earliest opportunity. Student work is then reviewed by the MSc External

Examiners, whose role is to ensure fair and objective marking and the maintenance of high academic standards across the School's MSc programmes. The MSc Examination Board has the responsibility for confirming the final marking of all submitted work and decisions on distinctions and resubmissions.

Marking of all course work is on a scale of 0–100% with a pass mark of 50% and grading as shown below:

80% or above	Distinction
70–79%	High Pass
50–69%	Pass (Low Pass = 50%)
49% or below	Fail

To qualify for the MSc, students must attain the 50% threshold mark on both the coursework average, and on the final project average mark. An overall final mark is then calculated as the weighted average of coursework and Dissertation/Design Thesis. Large differences (of more than 10 percentage points) in the marking of the assessors are moderated by the Programme Head or an appointed assessor from the Programme staff when necessary.

Grading Outcomes and Criteria

Distinction: Demonstrates an exceptional level of achievement overall, significantly exceeding the assessment criteria required to attain a Pass. The submission is complete under the requirements of the brief set. Coherence of thought is expressed throughout the work, with an exhaustive appreciation of topic and a rigorous application of critical reflection and insight. Developmental and final work is documented in a highly effective manner in a well-structured and skilfully presented submission.

High Pass: Demonstrates a high level of achievement overall, exceeding the assessment criteria required to attain a Pass. The submission is complete under the requirements of the brief set. Coherence of thought is articulated throughout the work, with a comprehensive appreciation of topic and a thorough application of critical reflection and insight. Developmental and final work is documented clearly in a coherently structured and well-presented submission.

Pass: Demonstrates a good level of achievement overall, meeting all aspects of the assessment criteria required to attain a Pass. The submission is complete under the requirements of the brief set. Coherence of thought is evidenced throughout the work, with an appreciation of topic and an appropriate level of critical reflection and insight. Developmental and final work is documented clearly in a suitably presented submission.

Low Pass: Work attaining the standard of Pass, but which has previously been assessed as Fail and/or has been submitted after the advertised date/time. Low Pass is capped at 50%.

Fail: Unsatisfactory level of achievement overall, which fails to meet all aspects of the assessment criteria required to attain a Pass. The submission is incomplete under the requirements of the brief set. The work is assessed as being incoherent, demonstrating little appreciation of topic, development or effort. The submission is insufficient in quantity and demonstrates a lack of engagement. An appropriate level of critical reflection and insight is not evidenced. Developmental and final work is not documented to an appropriate level of clarity, or presented to a suitable standard. This assessment is also the automatic result of failure to meet minimum attendance requirements. A submission receiving a Fail assessment can only achieve a Low Pass outcome upon successful resubmission. Students who have no further opportunity to undertake repeat studies are asked to leave the School.

2.5 AWARD CLASSIFICATION

The MSc degree is awarded as either:

- A pass.
- A 'Distinction' when the overall final mark is 80% or higher.

Other grading from coursework is registered in the School's database and is available on transcripts but do not appear on certificates.

2.6 AA MASTERS TO PhD PATHWAY

Upon successful completion of Master's study, graduates from the MA, MSc, PG MArch, MFA and Taught MPhil programmes are given the opportunity to develop their Master's thesis into a proposal to apply for the AA PhD programme. Applications to the PhD through this pathway can be considered for commencement in the academic year immediately after the student's graduation from their Master's programme.

2.7 LEARNING SUPPORT

Every student has continuous access to a design studio with storage space, along with access to all of the AA School's facilities at Bedford Square in London and in Hooke Park, Dorset. Introductory sessions are provided by the relevant academic resources departments at the beginning of the academic year to all students.

On-site resources at Bedford Square include a large wood and metal workshop, a model making workshop for materials such as clay and plastics, a digital prototyping lab, an audio-visual lab, a digital photography studio, an IT lab with both Mac and PCs, a drawing materials and print shop, the AA bookshop, AA library and AA archives. The AA also has its own bar and restaurant at Bedford Square.

Hooke Park in Dorset is the AA's satellite campus that hosts short residential workshops for visiting groups of students from throughout the school. Hooke Park is a 150-hectare working forest inside that provides the primary source of timber for student-led construction projects and also has large workshops, an IT lab, catering facilities and accommodation for students visiting from London.

The AA Writing Centre supports students in the development of their written communication skills and helps to strengthen reading, critical research and creative writing capabilities across all programmes and year groups.

AA Wellbeing offers students confidential, one-to-one wellbeing support and workshops. The team is available to explore students concerns, anxieties and emotional difficulties to support their wellbeing and academic progression. Difficulties may include the effects of bereavement, loss, lack of confidence, mood regulation, relationship difficulties or managing mental health.

The AA's London based Public Programme is an extensive series of public events dedicated to contemporary architectural culture: exhibitions, members' events, lectures, seminars and conferences, along with regular book launches hosted by the AA bookshop. Evening lectures are available online to view at Hooke Park. A weekly published school events lists is published through the communications studio.

School-wide facilities and resources are described in more details on the AA Website.

SECTION 3:

MSc IN DESIGN AND MAKE

3.1 PROGRAMME INTRODUCTION

Design + Make (MArch/MSc) is based at the AA's satellite campus at Hooke Park, a rich context which serves as an immersive laboratory for architectural research. Students study within a working forest, inhabiting a unique environment in which landscape, studio and workshop are interwoven. Since its establishment in 2010 the programme has become a leading example of experimentation through education, celebrated for its creative innovation in timber fabrication, its integration of thinking across natural resource extraction and architecture, and its pedagogical model of design through physical production.

In the face of urgent, global environmental concerns, Design and Make offers a methodology for architectural production that is deeply rooted in a consideration for material resources, earth systems and their limits. Pursuing a direct physical engagement with the making of architecture.

The Hooke Park Campus is surrounded by a 330-acre working woodland, owned and managed by the AA, set within a rich regional landscape context that encompasses the Jurassic Coast. Students investigate the innovative use of locally sourced materials – with a particular expertise in timber - to build live projects and drive new forms of research. It is a problem-solving approach that integrates forestry, ecology, craft and material knowledge with progressive design, computational and fabrication technologies.

Design through making is the focus here in our woodland studio. The research we conduct demonstrates a vision for architectural education in which making (and remaking) is central to the act of design itself. The workshop facilities on site provide a unique testing ground where we devote time to speculative research through the fabrication of highly crafted, experimental prototypes.

We materialise built work through curiosity, craft and creativity. Speculative design attitudes drive the development of built projects. Our twin catalysts for the imagination are our direct physical engagement with the site and the alchemy of the act of making – we thrive on the unexpected revelations each of these bring.

We use a hands-on approach, and students are expected to spend the majority of their time in the workshop, developing an in-depth material understanding. Technology – such as 3D scanning, advanced modelling and CNC production – is deployed to augment traditional craft and material knowledge with the aim of striking an agile balance between the computational and the physical. This is a delicate blend which creates fertile conditions for innovative projects to thrive.

This forest laboratory is a space of intense investigation, a wild-wood of creativity and a home for architectural adventurers.

The Design and Make Programme is a bifurcated programme comprising MSc (12 months) and MArch (16 Months). MSc and MArch Students work closely together. MSc students have a more explicit technical focus, specifically on innovative applications for timber in architecture which becomes the focus for their dissertation. The MArch students use making as a vehicle for broader architectural design research, and each student reflects critically on aspects of the work in their thesis.

3.2 AIMS

MSc Design and Make pursues making-led architectural technical research, with a focus on timber. Developing research techniques that benefit from the immediacy of the hands-on workshop context and local material source. Students work at full scale on group fabrication projects and then develop their design research through detailed prototypes, test fragments and working models, making the most of the opportunities presented by the Hooke Park setting. This development is supported through the teaching of both established and emerging fabrication and craft techniques, as well as seminars relating to forestry and timber construction, resulting in making-led, informed design research. This is supplemented through the Dissertation with an understanding of modes of scientific methodology and their parallels in design practice.

In the first term students are introduced to Hooke Park's unique context and equipped with the necessary abilities to engage confidently with the diverse set of physical and digital fabrication tools and methodologies on offer.

The Design Through Making Studios run through term 1 & 2, supported by taught skills sessions in Fabrication Methods and Digital Skills. The work is structured around group build projects, within tightly defined design parameters, where students begin hands-on and develop the fabrication skills and tools to support their design/make projects whilst having the opportunity to work as a team.

Students are also introduced to strategies for the documenting and presentation of process-based research. This informs the development of the Fabrication Log; a working record of individual design process which becomes a companion to made work throughout the year, and includes working notes and sketches, photography, and film.

Two Seminar courses in Term 1 – Making as Design and Timber Technologies – and one in Term 2 – Force, Form, Material complement the Studio by situating the Design + Make programme and the students' research within a broader cultural and technical context. Together they provide the theoretical foundation of the programme and introduce the various fields of knowledge relevant to the design of experimental timber prototypes. MSc students undertake the Timber Technologies essay in Term 1, which functions as an early exploration of dissertation content and intellectual position.

In this way the first two terms introduce the theoretical and technical context, key design methodologies and fabrication practices central to the programme. Students learn the fundamentals of timber technology, a core fabrication skill set and undertake an intensive exploration of design through making.

Terms 3 & 4 build on this with the development of a focused design research project and related technical dissertation, resulting in well-documented built prototypes and models, with term 4 seeing the development of the final portfolio submission and a dedicated write up period for the technical dissertation.

These components are supplemented by extra-curricular provision, including workshops, talks, visits and practical introductions as wells as by Public Programme lectures streamed live to Hooke from London.

3.3 LEARNING OUTCOMES

INTENDED LEARNING OUTCOMES: MSc in Design and Make; FHEQ LEVEL 7	
Learning Outcomes 'LO'	Aligned to the Framework for Higher Education Qualifications (FHEQ) and QAA Subject Benchmark (Architecture), on successful completion of the MA in Design and Make students will be able to:
A	**Knowledge and Understanding**
A1	Demonstrate knowledge of the application of innovative fabrication technologies and methodologies in the production of architectural constructs.
A2	Demonstrate critical awareness of advanced digital design techniques, the realms of their application, and their relative merits when integrating design and production.
A3	Demonstrate knowledge of timber properties and production with respect to its use as a construction material.
A4	Understand innovative application of timber in architecture, including through advanced design and fabrication techniques.
A5	Demonstrate systematic knowledge of the historical and theoretical bases of design-make approaches and the relationship between ideas and technique in architecture.
A6	Understand the current thinking within contemporary critical discourse surrounding landscape in relation to natural resource extraction and the sustainable application of biogenic materials in architecture.
A7	Demonstrate knowledge of the application of structural design tools and methodologies in the production of architectural constructs.
A8	Demonstrate knowledge of testing and data recording methodologies to determine structural properties of materials or assemblies.
B	**Subject Specific Skills and Attributes**
B1	Conceive, produce, represent and articulate a comprehensive design research proposition.
B2	Research contemporary and traditional construction technologies and be able to identify and characterise relevant architectural typologies and built precedents.
B3	Synthesise technologies to develop and communicate advanced approaches to design and construction.
B4	Produce detailed design information for fabrication and construction.
B5	Demonstrate practical skill competency in the processes of fabrication and the ability to make informed pragmatic judgments concerning methods of construction.
B6	Conduct research that positions the physical production of architectural components as the focal point of its evidence.
C	**Transferable Skills and Attributes**
C1	Carry out critical and technical analyses of design and construction proposals.
C2	Communicate effectively with a wide range of individuals visually, orally and in writing, including within interdisciplinary professional teams.
C3	Formulate clear and appropriate hypotheses and arguments and apply these within a research agenda.
C4	Continue expanding knowledge using the skills acquired.

3.4 ASSESSMENT

Assessment Mechanisms

Students are assessed on the submitted documents and an assessment of the final built construct or prototype. Submissions are made on the stated submission date consisting of:

- A PDF submission (max size 10MB) uploaded to the AA submissions Portal
- A Physical document for the final Portfolio and Thesis submission, submitted to the Design + Make Programme Heads in the Hooke Park office.

Late submissions are penalised in line with AA School policy, work submitted up to seven days after the deadline will be marked and 10 marks (on a scale of 100) will be deducted for that element, for each calendar day of lateness incurred. Any piece of work submitted 7 or more days after the deadline will not be assessed and assigned a mark of 0, unless the student submits personal circumstances and these are accepted. Mitigating circumstances for late submissions are considered as detailed in the AA Academic Regulations.

All submissions are assessed and marked by two or more members of the programme's regular academic staff and confirmed by the Internal Assessment Committee. Student work is then reviewed by the MSc external examiners, whose role is to ensure fair and objective marking and the maintenance of high academic standards across the School's MSc programmes. The MSc Examination Board has the responsibility for confirming the final marking of all submitted work.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. The assessment of submitted work is based on the following overall assessment, in addition to specific ones given for each module. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context and analysis
The work demonstrates a systematic understanding and critical awareness of relevant contextual factors such as site conditions, social, political, historical, economic, environmental and ethical issues. Analysis is undertaken in relation to the needs of the intended user groups and the complexities of the location. Appropriate conceptual, critical and/or technological precedents, methodologies, practices and/or tools inform the parameters of the brief, satisfying specific contextual and analytical requirements.

Process and synthesis
Research into appropriate contextual, conceptual, critical and/or technological precedents, methodologies, practices and/or tools is synthesised into the design process, allowing for creative decision-making, inventive design strategies, experimentation and originality, explored from both user and designer perspectives. Feedback is integrated into a self-directed design process that demonstrates criticality and independent learning skills, and the ability to work in a group where necessary, required for continuing professional and academic development.

Resolution and communication
Design proposals are resolved to a satisfactory standard based on the functional and aesthetic criteria and/or project themes set by the brief, with appropriate methodologies deployed in the production of appropriately ambitious propositional design work. Project work is organised, structured and communicated effectively through a range of considered representational methods and visual, verbal and written skills.

3.5 CREDIT FRAMEWORK

Term	Course Title	Credits
1	Core Module 1 – Design through Making: Induction Studio	30
1	Core Module 2 – Timber Technologies Seminar	10
1	Making As Design Seminar	0 (Supporting programme content)
1 + 2	Fabrication Methods	0 (Supporting programme content)
1 + 2	Design Information Digital Skills	0 (Supporting programme content)
2	Core Module 3 – Design through Making: Research Studio	40
2	Force, Material, Form Seminar	0 (Supporting programme content)
3 + 4	**Core Studio/Thesis – Design Make Studio**	**100 (as below)**
3 + 4	Portfolio & Built Prototype	80
3 + 4	Dissertation/Technical Report	20

3.6 TEACHING AND LEARNING METHODS

Seminar Courses
The Seminar Courses consist of bi-weekly taught sessions supported by external lectures. Active participation by students in all seminars and lectures is a requirement of the programme. Students are given a reading list at the beginning of each course and are required to read set preparatory or follow-up material, and to make group or individual presentations at seminars.

For the Timber Technology essay the seminar tutor will give tutorials to aid students in choosing their essay topics and focusing and developing their writing. An abstract of the proposed essay will be required from each student before the end of the seminar series, to ensure that an essay argument has been identified. The content, learning outcomes and assessment requirements of the seminar course is defined below. Assessment of the Timber Technology Seminar course is of a written, illustrated essay submitted at the end of Term 1.

Studios
The Studios run throughout the length of the course and consist of the Design through Making - Induction and Research Studios, and The Core Studio. Whilst each Studio has different mechanisms and objectives, the general teaching strategies are common. Each Studio is set out by a brief and support is provided by the course directors, studio tutors, consultants and other invited lecturers, critics and jurors. These regular staff and invited lecturers give formal design/make tuition through lectures, workshops, tutorial contact and group sessions. Typically, this formal teaching occurs during weekly sessions at Hooke Park.

Student studio work takes place in the Design + Make studio and workshop spaces at Hooke Park, with physical workshop making, full-scale prototyping and site-based construction to be carried out as per the Project brief. Each project introduces a range of concepts and techniques, and students document their own work and make regular presentations. Design reviews and juries, at which students present work-in-progress for critique, are held at defined points through each Project. Generally, each project will end with a Final Jury presentation. The specific submission requirements are given in the Course Syllabi.

Group Working Methodologies
Collaborative design and group build activities form a central aspect of the programme. Students are required to respond to specific briefs as a collective design team (or teams). Prototypes and experimental architectural constructs are fabricated by student teams with guidance from tutors and technical staff. However, whilst design and fabrication is approached collaboratively, all submissions are individual and

should demonstrate each individual student's role within the team and their specific area of research focus within the group project. All work in the submissions is clearly credited and attributed to individuals or groups as appropriate.

Research: MSc Dissertation
The individual Dissertation is supported by the seminar course: Force, Material, Form held in Term 2, and individual tutorials through term 3 to assist students in the development and production of the Dissertation. MSc students produce their 4000-word Dissertation during the summer (MSc Term 4) for submission at the end of the 12-month programme. The purpose of the Dissertation is to present original research in the application of timber design and fabrication technologies in structural, envelope or other architectural applications.

Non-Assessed Activities
In additional to the required seminars and studios, various talks, lectures and visits are organised periodically to complement the programme.

3.7 COURSES

TITLE	**CORE MODULE I – DESIGN THROUGH MAKING: INDUCTION STUDIO**		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Emmanuel Vercruysse, Kate Davies, Will Gowland, Sam Turner-Baldwin	Term	1
		Credits	30
Learning Methods	Weekly taught sessions	Workload	300 hours study, inclusive of teaching contact: 105 hours teaching/195 hours self-directed study

Synopsis

The *Design Through Making - Induction Studio* introduces students to the physical and material context at Hooke Park and enables them to develop design-make approaches driven by considerations of site and material. This is developed through a collective build project within which students are encouraged to establish a critical position with respect to strategies of design through making within the specific Hooke Park context.

Aims

The Design Through Making - Induction Studio, is structured around a collective, small scale, built project within which students develop their skills in fabrication and design for production and learn to work as a team. These explorations are geared towards informing a more challenging collective built project in term 2 and the development of technical research through speculative prototypes and working models in Term 3. The Studio is supported by taught skills sessions in both the *Fabrication Methods* and *Design Information Digital Skills* courses.

Content

Working in groups, students conduct technical explorations in response to a brief and supported by tutorials. This work is also informed by the skill sets they are developing through the Fabrication Methods and Digital Skills Sessions; as they become experienced with the workshops, tools and working methods. Alongside made work, the role of representation in the design process is also explored.

Learning Outcomes

- A1: Demonstrate knowledge of the application of innovative fabrication technologies and methodologies in the production of architectural constructs.
- A3: Demonstrate knowledge of timber properties and production with respect to its use as a construction material.
- A4: Understand innovative application of timber in architecture through digital design and fabrication techniques.
- A7: Demonstrate knowledge of the application of structural design tools and methodologies in the production of architectural constructs.
- B3: Synthesize these technologies to develop and communicate advanced approaches to design and construction.
- B4: Produce detailed design information for fabrication and construction.

- B5: Demonstrate practical skill competency in the processes of fabrication and the ability to make informed pragmatic judgments concerning methods of construction.
- B6: Conduct research that incorporates physical prototyping as the focal point of its evidence.
- C2: Communicate effectively with a wide range of individuals visually, orally and in writing.

Submission

- Individual Design Portfolio

Assessment Methods

An individually produced Design / Make Portfolio documents the processes and outcomes of the student's work within the group project. As well as detailed documentation of making processes, both exploratory and technical drawings form an important part of the submission, and should be used critically to analyse the work. The portfolio should include a short-written reflection on design / make approaches.

Students are to take a considered, inventive and critical approach to representing and documenting their project. The altered, reciprocal, role of representation when working in a design-make mode should be captured by collating and documenting the process as it goes along and using representative modes to both drive the work and reflect on it.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context and analysis

- The work demonstrates a systematic understanding and critical awareness of relevant contextual factors at Hooke Park
- The work addresses the site conditions - topographic, environmental and material
- The work demonstrates analysis of the given brief in response to the context above.
- A clear technical strategy is developed within the project
- A range of critical precedents, methodologies, practices and/or tools at the forefront of the discipline are investigated.

Approach and synthesis

- An integrated technical, environmental and aesthetic method is demonstrated
- The work demonstrates the application of research into precedents, contemporary technologies, materials and processes.
- Environmental, material and technical knowledge acquired and/or findings are synthesised into a self-directed and critical decision-making process, demonstrating originality in tackling problems
- The work shows an informed approach towards regenerative design
- The work demonstrates both independent learning and the ability to work in a group and the skills required for continuing professional and academic development.

Resolution and communication

- The work demonstrates the ability to analyse and refine technical concepts, communicating sound judgements and a critical understanding of the implications of technical design decisions.
- Through resolution, the project addresses the aesthetic, programmatic and functional requirements of the brief.
- The work is structured and organised effectively and communicated through advanced visual, verbal and written communication techniques.

TITLE	**FABRICATION METHODS**		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Emmanuel Vercruysse, Sam Turner Baldwin	Term	1 + 2
Learning Methods	Weekly practical workshop sessions	Credits	0 (Supporting programme content)

Synopsis

Fabrication Methods introduces students to the tools and fabrication techniques that they will be required to use throughout the programme. Skills are developed in Terms 1 and 2 through short introductory making exercises and taught sessions that directly support the collective build projects within the Design Through Making Studios.

Aims

The course aims to establish the working methods of the Design and Make course. Through a series of taught workshops, a familiarisation with analogue and digital tools is established and an essential skill-set developed. The focus lies upon providing students with an introduction to these technologies and instilling an understanding of their application and a confidence in their usage.

Content

Through a sequence of prescribed exercises students test fabrication and design methodologies, including:

- Familiarisation with key workshop tools and their use
- Working with timber - fundamental fabrication skills
- CNC; Machine and Software Familiarisation
- Traditional and contemporary approaches to fabrication using organic geometry
- Technical workshop and production drawings
- Site layout, component fabrication, and assembly strategies

Alongside these skill-based exercises, students are also introduced to strategies for the documenting and presentation of process-based research. This will inform the development of the Fabrication Log; a working record of individual design process which becomes a companion to made work throughout the year, an accumulative personal record that includes material research, shop notes, on-site observations and records of trials and failures. Although it is not a graded submission, the Fabrication Log provides an essential source of content for the Term 1 Portfolio.

Learning Outcomes

- A2: Demonstrate an understanding of design and fabrication tools and techniques, the realms of their application, and their relative merits when integrating design and production.
- B1: Apply these tools and techniques to produce a physical construct.
- B5: Demonstrate practical skill competency in the processes of fabrication and the ability to make informed pragmatic judgments concerning methods of construction.
- C2: Communicate effectively with a wide range of individuals visually, orally and in writing.

Submission

- N/A

TITLE	**CORE MODULE 2 – TIMBER TECHNOLOGIES SEMINAR**		
Level Teaching Staff Learning Methods	FHEQ Level 7 James Solly and visiting speakers Bi-Weekly seminar sessions with guest lectures to support	Status Term Credits Workload	Compulsory 1 10 100 hours study, inclusive of teaching contact: 25 hours teaching/75 hours self-directed study

Synopsis

Recognising timber's essential role in low-carbon architecture, the course provides an introduction to timber structures and their production, reviewing the chain of processes from forest planting to contemporary fabrication.

Aims

The course provides the technical foundation for the programme to equip students with an understanding of the core principles, supply chains and technical background of timber construction.

Content

The course introduces students to the full cycle of timber production, processing and construction, covering the topics below:

- Introduction to Forestry and Silviculture
- The forest at Hooke Park, it's history, species and ongoing management
- Wood Anatomy – Biological and Mechanical properties
- Production – Tree to Construction Material
- Architectural Design with Timber
- Fabrication of Timber Structures – Traditional, Typical and Novel
- Contemporary Timber Research

Learning Outcomes

- A3: Demonstrate knowledge of timber growth, production and properties and production with respect to its use as a construction material.
- A4: Understand the relevant application of timber in contemporary architecture, including through digital design and fabrication techniques.
- B2: Research contemporary and traditional construction technologies and be able to identify and characterise relevant architectural typologies and built precedents.
- C3: Formulate clear and appropriate hypotheses and arguments and apply these within a research agenda.

Submission

- Essay (2,000 words)

Assessment Methods

The seminar is assessed through a 2,000-word essay that expands further on one of the topics presented within the course through additional academic research on the topic,

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Research and knowledge acquirement
Research into the chosen area of study is independently undertaken, demonstrating a comprehensive understanding and critical awareness of the relevant social, political, historical, theoretical, economic, environmental and/or ethical contexts, concepts, ideas and/or precedents at the forefront of the discipline, being addressed through systematic enquiry.

Approach and development
The work submitted demonstrates an inventive and original approach to the consolidation and development of research, with a consistent process of synthesising acquired knowledge is evidenced in the work. The structures, methods and/or tools utilised in the production of the work demonstrate initiative, self-directed learning, the ability to work in a group where necessary, and the skills to make complex decisions.

Argument and communication
The work demonstrates the ability to devise and sustain complex arguments, contextualised effectively in a wider field of relevant ideas with a critical position determined. Conclusions and/or reflections are well executed, with good judgement shown in the absence of complete data. Written and visual communication skills are evidenced to a high standard throughout, and the work demonstrates the abilities developed to undertake further research.

TITLE	MAKING AS DESIGN SEMINAR		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Nat Chard	Term	1
Learning Methods	Bi-Weekly seminar sessions	Credits	0 (Supporting programme content)

Synopsis

The course explores the reciprocity between ideas and technique and their relationship in the process of building ideas. The seminars will discuss how a range of architects and engineers developed their practice following a background working with craft based or creative production such as cabinet making, carpentry, stone masonry, glass blowing, as blacksmiths, painters and writers. This will be related to the way they activate the creative and theoretical potential of materials and techniques (often beyond the materials and processes of which they have prior knowledge), illustrated with examples of how they and other architects, engineers and artists have appropriated or developed those techniques to embody their ideas in their work.

Aims

The course provides the theoretical foundation for the programme to help students assemble the relationships between the histories, theories, context and means of realising architecture with an emphasis on the part making plays in the theoretical discourse of architecture. The seminars will frame the ways in which an intellectual and practical understanding of making can have an influence on design beyond situations where the author is also the maker.

Content

The course sets out how knowledge is embodied in things as well as through texts – that the knowledge of how to make ideas is acquired through a mixture of:

- Understanding precedent - through studying examples through documentation such as drawings and other representations as well as examining the original item.
- Through scholarship - reading what others have to say that they share as explicit knowledge
- Through research – through personal experience of working with materials, constructing both explicit and tacit knowledge

The seminars will illustrate examples of such processes of learning and knowledge creation while each student will analyse examples of their choosing to help understand the relationship between the theoretical and practical aspects of the work they elect to study.

Learning Outcomes

- A5: Demonstrate systematic knowledge of the historical and theoretical bases of design-make approaches and the relationship between ideas and technique in architecture.
- C4: Continue expanding knowledge using the skills acquired.

Submission

- N/A

TITLE	**DESIGN INFORMATION DIGITAL SKILLS**		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Will Gowland	Terms	1 and 2
Learning Methods	Weekly taught sessions	Credits	0 (Supporting programme content)

Synopsis

The course is taught via weekly class sessions through terms 1 and 2, covering a range of relevant software skills and applying them within students *Design Through Making* Studios. These sessions are not credited and do not require course submissions; however it is highly recommended that students attend all sessions, as the skills and tools are fundamental and will be applied throughout the course.

Aims

The course aims to introduce students to the software, skills and processes which are core to the Design + Make methodology. Through aligning the Digital Skills course with the *Design Through Making* Studio, the aim is to learn methods of best practice, for the development of exemplar documentation, design information and presentation material using the live build project as a vehicle for production. More complex techniques will be introduced within the second term, to equip students with the knowledge and skills to be put into practice within the *Design Through Making - Research Studio*.

Content

The seminar course will consist of weekly classes, covering:

- Site Analysis and Documentation
- Photogrammetry & Lidar
- Digital Modelling and Drawing Production
- Rhino & Revit
- Visual Imagery and Graphic Representation for Portfolio and Report Production
- Indesign, Photoshop & Illustrator
- Film & Animation
- Premiere Pro & After Effects

Learning Outcomes

- A2: Demonstrate critical awareness of advanced digital design techniques, the realms of their application, and their relative merits when integrating design and production.
- B3: Synthesise technologies to develop and communicate advanced approaches to design and construction.
- B4: Produce detailed design information for fabrication and construction.
- C2: Communicate effectively with a wide range of individuals visually, orally and in writing, including within interdisciplinary professional teams.

. Submission

- N/A

TITLE	CORE MODULE 3 – DESIGN THROUGH MAKING: RESEARCH STUDIO		
Level Teaching Staff Learning Methods	FHEQ Level 7 Emmanuel Vercruysse, Kate Davies, Will Gowland, Sam Turner-Baldwin Weekly practical workshop sessions	Status Term Credits Workload	Compulsory 2 40 200 hours study, inclusive of teaching contact: 105 hours teaching/295 hours self-directed study

Synopsis

The Design Through Making - Research Studio follows on from the Design Through Making - Induction Studio, with students further developing design-make approaches in response to a given brief and driven by considerations of site and material. Iterative cycles of drawing, model-making and prototyping are employed, and students establish a critical position with respect to strategies of design through making within the specific Hooke Park context.

Aims

Through the Design Through Making - Research Studio, students work collectively on a built project and begin to develop the design and technical research interests that inform a focused design research project in Term 3 & 4.

Content

During the Studio, students conduct collective design and technical explorations, in response to a given brief, supported by tutorials. This work is also informed by the skill-sets developed through *Fabrication Methods* and *Digital Skills*; as students become experienced with the workshops, tools and working methods. Alongside made work, the role of representation in the design process is also explored.

Learning Outcomes

- A1: Demonstrate knowledge of the application of innovative fabrication technologies and methodologies in the production of architectural constructs.
- A3: Demonstrate knowledge of timber properties and production with respect to its use as a construction material.
- A4: Understand innovative application of timber in architecture through digital design and fabrication techniques.
- A7: Demonstrate knowledge of the application of structural design tools and methodologies in the production of architectural constructs.
- B2: Research contemporary and traditional construction technologies and be able to identify and characterise relevant typologies and built precedents.
- B3: Synthesise these technologies to develop and communicate advanced approaches to design and construction.
- B4: Produce detailed design information for fabrication and construction.
- B5: Demonstrate practical skill competency in the processes of fabrication and the ability to make informed pragmatic judgments concerning methods of construction.

- B6: Conduct independent research that incorporates physical prototyping as the focal point of its evidence.
- C2: Communicate effectively with a wide range of individuals visually, orally and in writing.

Submission

- Individual Design Portfolio

Assessment Methods

An individually produced design portfolio documents the processes and outcomes of the student's work. Both exploratory and technical drawings form part of the submission and should be used critically to analyse the work and articulate a clear design-research focus or area of interest.

The portfolio should include a short-written reflection on design intentions, making processes and technical investigation. Students are to take a considered, inventive and critical approach to representing and documenting their project. The altered, reciprocal, role of representation when working in a design-make mode should be captured by collating and documenting the process as it goes along and using representative modes to both drive the work and reflect on it.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context and analysis

- The work demonstrates a systematic understanding and critical awareness of relevant contextual factors at Hooke Park
- The work addresses the site conditions - topographic, environmental and material
- The work demonstrates analysis of the given brief in response to the context above.
- A clear technical strategy is developed within the project
- A range of critical precedents, methodologies, practices and/or tools at the forefront of the discipline are investigated.

Approach and synthesis

- An integrated technical, environmental and aesthetic method is demonstrated
- The work demonstrates the application of research into precedents, contemporary technologies, materials and processes.
- Environmental, material and technical knowledge acquired and/or findings are synthesised into a self-directed and critical decision-making process, demonstrating originality in tackling problems
- The work shows an informed approach towards regenerative design
- The work demonstrates both independent learning and the ability to work in a group and the skills required for continuing professional and academic development.

Resolution and communication

- The work demonstrates the ability to analyse and refine technical concepts, communicating sound judgements and a critical understanding of the implications of technical design decisions.
- Through resolution, the project addresses the aesthetic, programmatic and functional requirements of the brief.
- The work is structured and organised effectively and communicated through advanced visual, verbal and written communication techniques.

TITLE	FORCE, MATERIAL, FORM SEMINAR		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	James Solly	Term	2
Learning Methods	Bi-Weekly seminar sessions	Credits	0 (Supporting programme content)

Synopsis

The course delivers practical taught sessions and seminars covering an introduction to structural design and specifically on the use of timber material properties within this context. The sessions will include technical lectures, introductions to engineering analysis software and practical testing sessions.

Aims

The course supports students in their project work by covering material and structural engineering principles relating to the project brief.

Content

- Structural principles for architectural design
- Timber material properties
- Physical testing of materials including data recording and assessment
- Simulation, computation and relevant software solutions for different design challenges

Learning Outcomes

- A3: Demonstrate knowledge of timber properties with respect to its use as a structural material.
- A7: Demonstrate knowledge of the application of structural design tools and methodologies in the production of architectural constructs.
- A8: Demonstrate knowledge of testing and data recording methodologies to determine structural properties of materials or assemblies.
- C1: Carry out critical and technical analyses of design and construction proposals.

Submission

- N/A

TITLE	CORE STUDIO/THESIS – DESIGN MAKE STUDIO		
Level Teaching Staff Learning Methods	FHEQ Level 7 Emmanuel Vercruysse, Kate Davies, Will Gowland, James Solly, Sam Turner-Baldwin Tutorials Seminars Juries Lectures Workshop tutoring Self-directed learning	Status Terms Credits Workload	Compulsory 3 and 4 100 1,000 hours study, inclusive of teaching contact: 100 hours teaching/900 hours self-directed study

Synopsis

The Core Studio Project consists of the design, making and analysis of speculative architectural prototypes at Hooke Park which form the primary evidence for the Dissertation.

Aims

The Core Studio Project focuses on the production of a model-scale proposal, component or prototype of experimental timber architecture. The work is designed with the explicit intent to propose and test speculative or innovative architectural applications of timber, making the most of the woodland and fabrication resources at Hooke Park. Research topics are agreed with tutors with a focus on the innovative technical application of timber within architecture. The core aim is for the student to develop a critical understanding of emerging fabrication and timber technologies and conduct an innovative piece of architectural design research through making.
Working individually or within group, the work will take the form of prototypes, models and built demonstrators and is driven by a defined research focus. The work seeks to harness visceral embodied engagement with the 'stuff' of architecture in pursuit of inventive, unpredictable propositions.

Students develop a statement of technical research intent. The full formulation and development of the work takes place by designing through making. The final work is informed by iterative cycles of drawing, modelling, scale and 1:1 tests, and is the focus for the Technical Dissertation. All tooling, fabrication and assembly processes must be rigorously documented and discussed in the Portfolio. Several presentations of the research proposal and preliminary prototypes are held for feedback and critique.

Prototyping starts early to inform design strategies and students engage with a phase of continuous fabrication.

Learning Outcomes

- A1: Demonstrate knowledge of the application of innovative technologies and methodologies in the production of architectural constructs.
- A2: Demonstrate critical awareness of advanced digital design techniques, the realms of their application, and their relative merits when integrating design and production.
- A3: Demonstrate knowledge of timber properties and production with respect to its use as a construction material.
- A4: Understand innovative application of timber in architecture, including through digital design and fabrication techniques.
- A5: Demonstrate systematic knowledge of the historical and theoretical bases of design-make approaches and the relationship between ideas and technique in architecture.

- A6: Understand the current thinking within contemporary critical discourse surrounding landscape in relation to natural resource extraction and the sustainable application of biogenic materials in architecture
- A7: Demonstrate knowledge of the application of structural design tools and methodologies in the production of architectural constructs
- A8: Demonstrate knowledge of testing and data recording methodologies to determine structural properties of materials or assemblies
- B1: Conceive, produce, represent and articulate a comprehensive design research proposition
- B2: Research contemporary and traditional construction technologies and be able to identify and characterise relevant architectural typologies and built precedents.
- B3: Synthesise these technologies to develop and communicate advanced approaches to design and construction.
- B4: Produce detailed design information for fabrication and construction.
- B5: Demonstrate practical skill competency in the processes of fabrication and the ability to make informed pragmatic judgements concerning methods of construction.
- B6: Conduct independent research that incorporates physical prototyping as part of its evidence.
- C1: Carry out critical and technical analyses of design and construction proposals
- C2: Communicate effectively with a wide range of individuals visually, orally and in writing, including within interdisciplinary professional teams.
- C3: Formulate clear and appropriate hypotheses and arguments and apply these within a research agenda.
- C4: Continue expanding knowledge using the skills acquired.

Submission

- Individual Design Portfolio & Prototypes
- Technical Dissertation

Individual Design Portfolio & Prototypes
An individually produced comprehensive design portfolio documents the processes and outcomes of the student's work, from concept to prototype. Students should be rigorous in both representing and analysing the work. Both exploratory and technical drawings form part of the submission and should be used to articulate a clear design-research agenda and critically reflect on the work.

The portfolio should include a short-written reflection on design intentions, making processes and technical investigation.

Students are to take a considered, inventive and critical approach to representing and documenting their project. The altered, reciprocal, role of representation when working in a design-make mode should be captured by collating and documenting the process as it goes along and using representative modes to both drive the work and reflect on it. Students are encouraged to experiment with diverse modes of documenting and analysing acts of making architecture, including time-based media.

Technical Dissertation
MSc students produce their 4,000-word individual Dissertation for submission at the end of the 12-month programme. The Dissertation is a rigorous, illustrated technical report or research paper, that supports the student's project work, and addresses a clear research question.

Each MSc student is supported in formulating an individual research question that relates closely to the built prototype and can be addressed through experiments that use design-making as their key methodology. The research is to be original, relevant, ambitious (and focused and feasible), and be directly related to the Hooke Park context and developed as a continuation of its research trajectories.

The aims, methodology, results and analysis (with respect to the research question) are each presented and the work is critiqued in its relevant broader cultural context, applicability within architecture, and opportunities for further research.

Assessment Methods

Students are assessed individually through the Portfolio, the prototypes themselves and the Technical Dissertation.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Research and knowledge acquirement
Research into the chosen area of study is independently undertaken, demonstrating a comprehensive understanding and critical awareness of the relevant social, political, historical, theoretical, economic, environmental and/or ethical contexts, concepts, ideas and/or precedents at the forefront of the discipline, being addressed through systematic enquiry.

Approach and development
The work submitted demonstrates an inventive and original approach to the consolidation and development of research, with a consistent process of synthesising acquired knowledge is evidenced in the work. The structures, methods and/or tools utilised in the production of the work demonstrate initiative, self-directed learning, the ability to work in a group where necessary, and the skills to make complex decisions.

Argument and communication
The work demonstrates the ability to devise and sustain complex arguments, contextualised effectively in a wider field of relevant ideas with a critical position determined. Conclusions and/or reflections are well executed, with good judgement shown in the absence of complete data. Written and visual communication skills are evidenced to a high standard throughout, and the work demonstrates the abilities developed to undertake further research.

SECTION 4:

MSc IN EMERGENT TECHNOLOGIES AND DESIGN

4.1 PROGRAMME INTRODUCTION

Emergent Technologies and Design Post-Graduate Programme (inaugurated in 2001) offers two degrees of Master of Science (12 months) and Master of Architecture (16 months) and is open to graduates in architecture and engineering who wish to develop skills and pursue knowledge in architectural design science that is located in new production paradigms. The programme continues to investigate new synergies of architecture and ecology through the critical intersection of computational design and advanced fabrication. Its focus is on exploring the experiential, social, and cultural potentials of new material and spatial configurations for architectural, urban, and ecological design solutions situated in the dynamic contexts of emerging biomes. The programme is designed to stimulate critical thinking through experience of research-driven design projects that are developed in an intellectually rigorous and creative studio environment. EmTech projects are pursued by multiple iterations through hypothesis, material and computational experimentation, advanced fabrication including robotics, and evaluation, reflected upon in verbal presentations and group discussions and documented in analytical and scientifically structured papers.

Emergent Technologies and Design (EmTech) program showcases an interdisciplinary approach, weaving together diverse disciplines to redefine the role of architectural education and the architect, in particular. The curriculum integrates advanced principles from engineering, computer science, biomimetics, and material sciences with critical insights from sustainability, urbanism, ecology, and complexity theory.

Key to EmTech’s approach is its workshops and seminars that emphasize computational design and physical fabrication, allowing students to engage directly with both digital and hands-on production techniques. This integration enables the exploration of sustainable design solutions inspired by biological systems through biomimetics, enhancing the ecological responsiveness of architectural projects. Moreover, the program challenges traditional boundaries by incorporating complex system theories and advanced digital fabrication, including robotics, into the core of its academic exploration. This fosters a learning environment where theoretical knowledge meets practical implementation, equipping students with the necessary skills to innovate within the rapidly evolving field of architecture.

EmTech's dissertations reflect this interdisciplinary ethos, with projects that not only address theoretical and material innovation but also tackle pressing global issues such as urban sustainability and ecological resilience. Through this comprehensive educational approach, EmTech prepares its graduates to lead and innovate in addressing the multifaceted challenges of contemporary architecture and urban design.

EmTech offers both MSc and MArch degrees. The MSc focuses more on developing skills and pursuing knowledge in architectural design science within new production paradigms, emphasizing computational design and fabrication methodologies to address real-world design problems and contexts. The MArch, while sharing a common emphasis on innovation and technology integration, allows for a deeper engagement in architectural design processes, considering the practical application and execution of design projects across a range of scales, including material experimentation, architectural configurations, as well as urban and ecological solutions. Both degrees involve rigorous experimentation and research but engage with different scales of implementation in their application strategies.

Our PG MSc programme has two distinct phases – the Studio and the Dissertation. Both Studio and the Dissertation are aligned with and supported by the research of the programme team and the advanced expertise our alumni and research colleagues in practice and industry.

4.2 AIMS

The programme is designed to build skills, knowledge and to stimulate critical thinking through the experience of research driven design projects that are developed in an intellectually rigorous and creative studio environment. Our projects are pursued by multiple iterations through hypothesis, material and computational experimentation, robotic fabrication, and evaluation; reflected upon in verbal presentations and group discussions and documented in analytical and scientifically structured papers.

Design Research is central to the agendas of Emergent Technologies and Design, and the programme proceeds from the fundamental premise of a shared understanding between staff, students, researchers, and collaborators across the world that nature and artifice are strongly coupled, that the cultural production of artefacts and systems exist as part of the environment of other active systems, and that they are subject to change. They also share an understanding that causality of change is complex and multi-scalar, that the dynamics of change are perturbed and accelerated by human activities, and they share a concern for the consequences of those changes to society and the natural world. Design processes in this domain are developed through iterative computational processes of serial experimentation and analysis, generative propositions, and simulations. The programme is structured to provide skills and knowledge of a coherent set of linked and convergent discourses, methodologies, and concerns that cross multiple disciplines in the Studio, and the opportunity to further develop those skills and deepen knowledge in the Dissertation.

While climate change continues to intensify, as designers, architects, and engineers we have a crucial role in designing structures and settlements that can withstand extreme weather conditions and adapt to variable biomes. We will need to incorporate resilience into our designs and consider their environmental impact, ensuring that our design solutions can endure extreme climatic events such as hurricanes, floods, and extreme heat or cold. Furthermore, we need to consider the local ecosystems we are proposing solutions for and aim to create designs that integrate with and support the surrounding environment, rather than disrupt it. As extreme ecological events and climate change become the new norm, we will need to create designs to help mitigate their effects, while also preparing for their impacts. In EmTech, we aspire to equip ourselves for what lies ahead.

The Studio (Core Modules 1/2A/2B/3A/3B/4 and Elective) comprises workshops, seminars, electives, and design projects that are led by EmTech staff and our associated researchers and offers a creative and intellectually rigorous sequence of study that builds knowledge and skill. It provides an intensive engagement in Design Science and introduces our students to the wider community of design researchers in global practices. It concludes with guiding students through the formation of a detailed proposal for an original architectural inquiry that is to be pursued in the Dissertation.

The Dissertation Research Studio (Core Studio / Thesis) extends the acquisition of research competencies through extensive collaborative dialogue with EmTech's research community of active Post Doc researchers and PhD candidates. The principal domains of our design research are positioned at the confluence of two major research trajectories:

- Dynamic Material Systems with Advanced Fabrication – focused on advanced fabrications and assembly technologies applied at the scale of medium/large buildings and/or landscapes.
- Ecological Urban Design in Emergent Biomes - focused on algorithmic design for metabolic models of new cities and settlements and their integrated technologies at the scale of an ecologically defined landscape such as a shoreline, river valley, delta or hillside.

Students integrate explorations of the theoretical discourses, relevant sciences and case studies of 'state of the art' projects in the domain of their chosen topic and set out the methods and protocols for the development of their Design Proposal. The development and conclusion of the final proposal is pursued through the iterative design cycles in which students have acquired knowledge and skills during the early phases of the programme.

Design and Build is our 'extracurricular' collaborative student project and is an essential part of the pedagogy and culture of EmTech. It runs right through the year, alongside both Studio and the Dissertation, and provides opportunities to design and deliver a built project with real material, structural, fabrication and assembly constraints. The experience gained enhances the design, computational and analytical skills students have acquired in Studio, and it develops crucial transferrable skills that are applicable to professional practice. Our Design and Build projects have been published internationally in the architectural press since 2001 and have received industry awards.

4.3 LEARNING OUTCOMES

INTENDED LEARNING OUTCOMES: MSc in Emergent Technologies and Design; FHEQ LEVEL 7	
Learning Outcomes 'LO'	Aligned to the Framework for Higher Education Qualifications (FHEQ) and QAA Subject Benchmark (Architecture), on successful completion of the MSc in Emergent Technologies and Design students will be able to:
A	**Knowledge and Understanding**
A1	Assimilation of the programme material and familiarity with concepts, techniques, and strategies in the field of Emergence.
A2	Assimilation and familiarity with material processes and advanced manufacturing techniques.
A3	Assimilation and familiarity with advanced digital and mathematical design techniques.
A4	Assimilation and familiarity with advanced digital structural and environmental analysis.
B	**Subject Specific Skills and Attributes**
B1	Demonstration of clear and appropriate formulation of hypotheses and arguments, and the ability to deploy these for the planning and pursuit of a research agenda.
B2	The ability to conduct comparative analysis and produce meaningful generalization.
B3	Demonstration of clear structure, precise writing and presentation of work; referencing of sources, information using agreed conventions.
B4	The development of critical faculties and advanced design skills.
B5	Demonstration of judgment and appropriate application of research material and technical knowledge to design and material experiments.
B6	Demonstration of capacity to apply acquired knowledge and techniques in a creative and innovative way to a comprehensive architectural design and to its material construction.
B7	Demonstration of capacity to apply the acquired knowledge and techniques in a creative and innovative way to a general architectural construction type and material system, or to a developed and tested generative strategy of architectural design.
C	**Transferable Skills and Attributes**
C1	A thorough knowledge of the specific concepts, techniques and practices in the field of Emergent Technologies and their effect on the production of built architectures and artefacts.
C2	Capacity for critical and technical analysis.
C3	The ability to construct Case Studies by applying critical and technical analysis to historical modes of construction.
C4	The ability to connect analysis to design philosophies and material strategies and relate them to industrial processes and production.
C5	Skills in developing and pursuing architectural and technical research in the field of Emergent Technologies, and in presenting research findings individually and as part of a group.
C6	The ability to contribute to interdisciplinary professional teams.

4.4 ASSESSMENT CRITERIA

All learning outcomes must be met in order to achieve a pass overall. The assessment of submitted work is based on the following overall assessment, in addition to specific ones given for each module. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Design

Context and analysis
The work demonstrates a systematic understanding and critical awareness of relevant contextual factors such as site conditions, social, political, historical, economic, environmental, and ethical issues. Analysis is undertaken in relation to the needs of the intended user groups and the complexities of the location. Appropriate conceptual, critical and/or technological precedents, methodologies, practices and/or tools inform the parameters of the brief, satisfying specific contextual and analytical requirements.

Process and synthesis
Research into appropriate contextual, conceptual, critical and/or technological precedents, methodologies, practices and/or tools is synthesised into the design process, allowing for creative decision-making, inventive design strategies, experimentation, and originality, explored from both user and designer perspectives. Feedback is integrated into a self-directed design process that demonstrates criticality and independent learning skills, and the ability to work in a group where necessary, required for continuing professional and academic development.

Resolution and communication
Design proposals are resolved to a satisfactory standard based on the functional and contextual criteria and/or project themes set by the brief, with appropriate methodologies deployed in the production of appropriately ambitious propositional design work. Project work is organised, structured, and communicated effectively through a range of considered representational methods and visual, verbal, and written skills.

Technology

Context and analysis
The work demonstrates a systematic understanding and critical awareness of relevant contextual factors such as site conditions, social, political, historical, economic, environmental, and ethical issues that influence the technical strategy developed in the project and its overall impact on the climate where necessary. A range of critical precedents, methodologies, practices and/or tools at the forefront of the discipline are investigated to inform the environmental and technical parameters of the brief.

Approach and synthesis
An integrated technical, environmental, and contextual method is demonstrated through the application of research into precedents, contemporary technologies, materials, and processes. Environmental and technical knowledge acquired and/or findings are synthesised into a self-directed and critical decision-making process, demonstrating originality in tackling problems, an informed approach toward a regenerative approach to design, independent learning, and the ability to work in a group if necessary, and the skills required for continuing professional and academic development.

Resolution and communication
The work demonstrates the ability to analyse and refine technical concepts, communicating sound judgements and a critical understanding of the implications of technical design decisions at a range of scales over the lifecycle of the project. Through resolution, the project addresses the contextual, programmatic and functional requirements of the brief. The work is structured and organised effectively and communicated through advanced visual, verbal, and written communication techniques. The PG MArch dissertation is required to demonstrate the capacity to apply the acquired knowledge and techniques in a creative and innovative way to a material prototype, to the system in which it is embedded, to its fabrications and assembly, and that is developed and evaluated within the context of a climatic or ecological set of parameters.

History & Theory

Research and knowledge acquirement
Research into the chosen area of study is independently undertaken, demonstrating a comprehensive understanding and critical awareness of the relevant social, political, historical, theoretical, economic,

environmental and/or ethical contexts, concepts, ideas and/or precedents at the forefront of the discipline, being addressed through systematic enquiry.

Approach and development
The work submitted demonstrates an inventive and original approach to the consolidation and development of research, with a consistent process of synthesising acquired knowledge is evidenced in the work. The structures, methods and/or tools utilised in the production of the work demonstrate initiative, self-directed learning, the ability to work in a group where necessary, and the skills to make complex decisions.

Argument and communication
The work demonstrates the ability to devise and sustain complex arguments, contextualised effectively in a wider field of relevant ideas with a critical position determined. Conclusions and/or reflections are well executed, with good judgement shown in the absence of complete data. Written and visual communication skills are evidenced to a high standard throughout, and the work demonstrates the abilities developed to undertake further research.

Professional Practice

Knowledge acquirement
The work analyses and reflects upon developments and insights at the forefront of the profession of architecture. Relevant contextual information and/or precedents are critically evaluated in order to inform the parameters of an appropriately clear and complete representation of the subject matter.

Integration and synthesis
The work demonstrates the ability to work independently and, in a group, where necessary, integrating and synthesising contextual information and acquired knowledge through a systematic method, evidencing self-direction, originality and the ability to respond critically to the subject matter.

Clarity of communication
The work elucidates concepts, facts and opinions in an analytical manner, evidencing the ability to construct and maintain a critical position. The work is structured and organised effectively, demonstrating good use of written and visual communication skills and the independent learning ability required for continuing professional development.

4.5 CREDIT FRAMEWORK

Term	Course Title	Credits
1	Core Module 1 – Design and Technology	10
1	Core Module 2a – Natural Systems and Biomimetics	10
1	Core Module 2b – Design I: Digital and Material Fabrication	15
2	Core Module 3a – Emergence and Evolutionary Computation	10
2	Core Module 3b – Design II: Ecological Urban Design	15
1 + 2	Climate and Ecological Systems in Design Science	10
1, 2, 3	Core Module 4 – Critical Discourses	10
3 + 4	Core Studio/Thesis – The Dissertation	100
2, 3, 4	Design and Build	0 (supporting programme content)

4.6 TEACHING AND LEARNING METHODS

A distinguishing characteristic of the programme is the emphasis on the team, and the skills and knowledge developed in collaborative learning, research, and design. Students work in small teams in studios, workshops, and seminar courses, and for their Dissertation choose their own team and topic. This is a reflection of the way in which architects work in the professional world, and in academic research in the Design Sciences. Both in the Studio and Dissertation phase, emphasis is placed on the balance between individual and group work, and the importance of critical reflection. Individual intellectual and critical development is reflected in the personal essays that each student undertakes and submits during The Studio, and in the individual Critical Reflection that each student develops and submits with their Dissertation.

Design processes in this domain are distributed and collaborative, and are explored, developed, and refined through iterative computational processes of serial experimentation and analysis, generative simulations, and material fabrication. The programme is structured to provide skills and knowledge of a coherent set of linked and convergent discourses, methodologies and concerns that cross many different disciplines in The Studio stage, and those skills are further developed, and knowledge deepened in The Dissertation stage.

Teaching strategies reflect this modality of research and design. Each member of the teaching team has their own speciality and active personal research, but also contributes to coordination of the agendas and delivery of each module and workshop, and to the programme as a whole. One or two members of the teaching team lead modules and workshops, but all teaching staff collectively attend key interim and other internal presentations to offer critical commentary and advice to clarify and develop the student work.
Student life in the programme provides additional opportunities for learning as all tutorials and instructions take place in open studio, and students attend and participate in all presentations by their colleagues in the programme. The programme facilitates the self-organisation of study groups and workshops for additional software skills in the evenings and weekends. For these reasons attendance in studio is mandatory Monday to Friday and is monitored.

Course Participation
Participation in seminars, workshops, and modules, and in studio generally is constantly monitored in studio discussions, design tutorials, and at presentations. If teaching staff have observed a lack of adequate participation, the student will receive a formal written warning from the Programme Director and is required to attend a mandatory meeting with teaching staff tutors to review participation and learning progress. Failure to improve participation to suitable levels results in the student being asked to repeat Phase I studies in the programme in the following year, or in extreme cases, leave the programme permanently. Students of this programme and others in the AA School receive an intense, highly supervised and closely monitored learning experience. It is the responsibility of all students to ensure that the arrangements of their personal circumstances (including payment of tuition fees) enable them to participate in all aspects of their course/programme of study. Details of the processes and requirements outlined above are set out in Section 17, Attendance and Attendance Management Procedures of the Academic Regulations. Appeal procedures regarding these decisions are also summarised in the AA School Academic Regulations.

The Studio (Core Modules)
The Studio workshops, seminars and design projects are led by EmTech staff and our associated researchers and offer a creative and intellectually rigorous sequence that builds knowledge and skill. It provides an intensive engagement in Design Science and introduces our students to the wider community of design researchers in London practices. It concludes with guiding students through the formation of a detailed proposal for an original architectural inquiry that is to be pursued in the Dissertation.

The teaching team and invited guests give tuition in studio, and students develop their skills and knowledge through research and design experiments. The Studio introduces a range of concepts and methodologies, and students document their work and make regular presentations. These are brought together and presented at the end of each course in a final presentation for critical advice, and in the compiled final documents submitted for assessment. The documents describe the work undertaken by the student team, the rationale for the decisions made, analyses and critically reflects upon the output, and situates the work in its theoretical, research and professional domains. Tutorials aid students in focusing and developing their submissions.

The Seminar courses embedded in The Studio have a common structure and method, with appropriate variation in delivery. Students are asked to read preparatory or follow up material, and make short group or individual presentations of work set at the end of each session. Each course has a written submission by the student team that documents the work undertaken, and an individual essay that critically reflects upon the work undertaken by their team, and situates in its theoretical, research and professional domains. Tutorials aid students in focusing and developing their submissions.

The Seminar courses are supported by a series of workshops that run throughout the Studio. More information on the seminar courses and workshops can be found in the Programme Handbook.
In Term 1, the programme offers 1 open module as part of the school-wide Electives programme: Climate and Ecological Systems in Design Science. For EmTech students, this elective is mandatory, and they may audit another suitable module offered by other programmes at the AA.

Thesis Formation takes place in studio in an intensive and highly structured week in the beginning of Term 3. Morning sessions are focused on topic discussions, exchanges and negotiations, and the afternoon sessions in writing proposals that are in turn presented and discussed the following morning. Dissertation Proposals are submitted at the end of the week, with sharply defined Abstracts, Ambitions, Methods and Domain statements. The proposals are reviewed by the teaching team, discussed with the students, reworked if necessary, and formally accepted.

At the conclusion of The Studio, all assessments of work submitted for the modules of the Studio are reviewed together with the Dissertation Proposal and students are then notified of progression to The Dissertation stage.

The Dissertation (Core Studio/Thesis)
MSc students produce their 10,000 – 15,000-word Dissertation for submission at the end of the 12-month programme.

The third and fourth term are entirely dedicated to the production of the Dissertation, with continuous review and supervision in Studio by the teaching team. Tutorials are scheduled each week in advance. Students review and synthesize the analyses, research, and case studies of the practices of design and production particular to the research topic. In the Research and Design Studio - Term 3 - students develop two chapters of their Dissertation from the Dissertation proposal, The Domain and the Methods, and pursue design experimentation appropriate to the central arguments and technical propositions. Supporting documentation of analysis, research conclusions, and strategic design decisions and argumentation in support of the Dissertation is written and refined. In addition to the scheduled weekly tutorials, regular presentations are made, and critical advice offered by the entire teaching team and invited guests.

Term 4 is focused on the design development and testing, and the final design proposal is produced, analysed, critiqued and refined. Tutorial arrangements, regular presentations and critical advice are similar to those in Term 3. The final presentations are to a panel of invited guests from practice and academia, and their critical advice is focused on the necessary steps to complete the Dissertation, and the finished document of the Dissertation is compiled and submitted.

4.7 COURSES

TITLE	CORE MODULE 1 – DESIGN AND TECHNOLOGY		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Milad Showkatbakhsh, Anna Font, Abhinav Chaudhary, Danae Polyviou, Paris Nikitidis, Krishna Bhat	Term Credits	1 10
Learning Methods	Lectures Seminars Workshops Tutorials Juries Self-directed learning	Workload	100 hours study, inclusive of teaching contact: 40 hours teaching/60 hours self-directed study

Synopsis

The Design and Technology seminar builds techniques and methods to develop proposals with advanced computational design, analysis, and fabrication strategies. A range of computational form-finding and analysis methods are introduced alongside the induction of C# programming and advanced digital fabrication techniques. Associations between the digital process of design and the physical world of fabrication and materiality are going to drive the experimentation and analysis stages. Initial experiments conducted by each design team will conclude with a working prototype of their design proposal. A combination of structural, morphological, and performance-related parameters are incorporated in the final prototypes through material and geometrical differentiation.

Aims

The seminar aims to engage analytical tools as methods for generative design, explores a variety of computational workflows, and includes seminars and hands-on workshops in the exploration of scientific methods applied to architectural design research, concentrating on experimentation, analysis, evaluation and decision-making processes.

Content

Areas of investigation include:

- Algorithmic reasoning and computationally informed generation and analysis of forms and behaviours
- C# Programming
- Structural Analysis
- Environmental Analysis
- Computational Fluid Dynamics (CFD)

Learning Outcomes

- A2, A3: Understanding of materials/material processes, modelling and digital fabrication techniques.
- B5: Development of experimental method and strategies in physical and digital experiments.
- B6, B7: Demonstration of the capacity to apply acquired knowledge and techniques in a creative and innovative way to a material system, its fabrication and assembly processes.
- A3: Assimilation and familiarity with advanced digital and mathematic design techniques.
- A4: Assimilation and familiarity with advanced digital structural and environmental analysis.
- C1: A thorough knowledge of the specific concepts, techniques and practices in the field of Emergent Technologies and their effects on the production of built architectures and artefacts.

- C4: The ability to connect analysis to design philosophies and material strategies, and relate them to processes of production.

Submission

- Team submission

Assessment Methods

Document assessments are carried out independently by at least 2 Programme Staff.

Document Submission (Team): The document presents the aims of the design experiments, the logics and processes developed and the analysis of their properties and performance in relation to Design and Technology. The relationships between mathematical models and physical prototyping are interrogated, and computational models are used to discover material-driven and geometrical interdependencies. The developed computational workflows are used to explore a family of possible outcomes that are analysed and evaluated based on chosen criteria. Correlations between initial physical experiments and computational models are formulated to provide feedback between digital and physical domains. The team dossier includes a critical account of the experiments, their rationale, computational and analytical models, and the physical prototype.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context and analysis
The work demonstrates a systematic understanding and critical awareness of the concepts, strategies, and analytical tools of Design & Technology. Appropriate critical and/or technological precedents, contextual factors, methodologies, practices and/or tools inform the parameters of the brief, satisfying specific contextual and analytical requirements.

Process and synthesis
Research into the appropriate contextual, critical and/or technological precedents, methodologies, practices and/or tools is synthesised into the design process, allowing for creative decision-making, inventive design strategies, experimentation and originality. The work demonstrates knowledge and skills of geometrical and topological analysis, digital morphogenesis and computational design processes, material behaviour, digital fabrication techniques and assembly processes, and the appropriate deployment of that knowledge and skills in an integrated process. Feedback is integrated into a self-directed design process that demonstrates criticality and independent learning skills, and the ability to work in a group where necessary, required for continuing professional and academic development.

Resolution and clarity of communication
Design proposals are resolved to a satisfactory standard based on the functional criteria and/or project themes set by the brief, with appropriate methodologies deployed in the production of appropriately ambitious propositional design work. Project work is organised, structured and communicated effectively through a range of considered representational methods and visual, verbal and written skills. The work elucidates hypothesis, research, and experimentation in an analytical manner, evidencing the ability to construct and maintain a critical position, and the skill to place this in the theoretical context of Design Science. The work is structured and organised effectively, demonstrating good use of written and visual communication skills and the independent learning ability required for continuing professional development.

TITLE	**CORE MODULE 2a – NATURAL SYSTEMS AND BIOMIMETICS**		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Milad Showkatbakhsh, Anna Font, Abhinav Chaudhary, Danae Polyviou, Paris Nikitidis, Krishna Bhat	Term Credits	1 10
Learning Methods	Lectures Seminars Tutorials Juries Self-directed learning	Workload	100 hours study, inclusive of teaching contact: 40 hours teaching/60 hours self-directed study

Synopsis

This course examines the ways in which biological organisms achieve complex emergent structures and performances from simple components, relating this to an exploration of architectural systems. The aim is to suggest the possibility of innovative system designs proceeding from a logical strategy derived from an analysis of natural systems. The seminar will focus on an in-depth study of a natural system, through its material organisation, material logics, form, energy flows and behaviour and the design principles extracted.

In groups, students will explore natural systems with variable stiffness, novel jointing strategies, surface adaptability or responsive mechanisms to investigate mathematic, geometric, material and hierarchical logics and their applications to architectural systems. The seminar is organised in three phases.

Aims

The course aims to develop an understanding of how biology can be a model for material, mechanical, spatial and computational systems. An introduction to the ways in which organisms have evolved through form, materials and structures in response to varied functions and environments is followed by an account of engineering, logical and organisational design principles that have been abstracted from nature in current research projects for industry and material science. A study is made of a natural system (general form, anatomy, energy flows, geometry, organisation, hierarchies and behaviour), along with an exploration of interrelations and an abstraction of design principles. The methods of analysis as well as system logics and material performance studied in this seminar will be further developed and investigated within Design I. Student groups will examine mathematic, geometric, material and hierarchical logics to develop a critical view on the relationships between systems design and performance.

Content

- Stage 1: Research
- Stage 2: Analysis and Initial Synthesis
- Stage 3: Final Synthesis and System Development

Learning Outcomes

- A1: Acquirement of knowledge of the concepts and principles in the field of Biomimetics, and their potential for the design and production of materials, structures and forms.
- B1: Acquirement of an understanding of how to abstract processes and parameters from a natural being situated in a specific environment.
- B5: The development of the ability to design an 'experiment' using computation tools abstracted from a natural system to generate forms and structures, and to use analytical methods to evaluate the results.

- B6: Acquirement of skills in working in biomimetic design.
- B3, C5: Acquirement of skills in the documentation and presentation of the aims and context of the design experiment, the process, products and the analysis of the results.

Submission

- Team Document submission
- Individual Essay (1,000 words)
- Integrated Computational Pipeline (implemented as a Grasshopper plugin)

Assessment Methods

Document assessments are carried out independently by at least 2 Programme Staff.

Document Submission (Team): The document presents the aims of the physical and digital design experiments, the logics and processes developed and the analysis of their properties and performance in relation to Biomimetics. The relationships between morphological models and mathematical models are interrogated, and parametric models will be used to discover material, geometrical, logical, computational and scaling limits of the abstracted systems. The developed parametric models are used to explore a family of possible outcomes and each individual will be analysed and evaluated based on chosen criteria. The team dossier includes a critical account of the experiments, their rationale and context, and a set of physical, computational and analytical models. It is expected that the document clearly presents observations and critical reflection of the experiments.

Grasshopper component submission (Team): A custom-made Grasshopper component (.gha) that performs specific computational tasks, mathematical operations, or geometric transformations that are specific to the computational system explored in the seminar course.

Document Submission (Individual): An individual 1,000-word critical essay is to be submitted that explores aspects covered in the seminar course. This essay should reflect on the theoretical and conceptual framework of biology as a model for architectural design and relate the work undertaken throughout the seminar to relevant references. Course material including compiled abstracts, readers and reading lists provide a starting point, but it should be noted that the submission is intended to extend beyond the limit of public domain information. Students are expected to research across several different disciplines. The document reflects upon the personal skills and knowledge gained and how they can be further developed in the future, together with a commentary on their participation and contribution to the team and the results.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context and analysis
The work demonstrates a systematic understanding and critical awareness of theories, practices and technologies of Biomimetic Design. Appropriate critical and/or technological precedents, contextual factors, methodologies, practices and/or tools inform the parameters of the brief, satisfying specific contextual and analytical requirements.

Process and synthesis
Research into the appropriate biomimetic system, technological precedents, and methodologies is synthesised into the design process, allowing for creative decision-making, inventive design strategies, experimentation and originality. The work demonstrates a clear formulation of a hypothesis, and an ability to plan and pursue a critical agenda for research into the performance of structure, material and organisational systems in biological and architectural systems. Feedback is integrated into a self-directed design process that demonstrates criticality and independent learning skills, and the ability to work in a group where necessary, required for continuing professional and academic development.

Resolution and clarity of communication
Design proposals are resolved to a satisfactory standard based on the criteria set by the brief, with appropriate skills, analytic reasoning, and methodologies deployed in the production of potential component systems and performance criteria for architecture derived from Biomimetic research. Project work is organised, structured and communicated effectively through a range of considered representational methods and visual, verbal and written skills. The work elucidates hypothesis, research, and experimentation in an analytical manner, evidencing the ability to construct and maintain a critical position, and judgement in the deployment of research material and knowledge gained from Biomimetic research. The work is structured and organised effectively, demonstrating good use of written and visual communication skills and the independent learning ability required for continuing professional development.

TITLE	**CORE MODULE 2b – DESIGN I: DIGITAL AND MATERIAL FABRICATION**		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Milad Showkatbakhsh, Anna Font, Abhinav Chaudhary, Danae Polyviou, Paris Nikitidis, Krishna Bhat	Term Credits	1 15
Learning Methods	Lectures Seminars Workshops Tutorials Juries Self-directed learning	Workload	150 hours study, inclusive of teaching contact: 30 hours teaching/120 hours self-directed study

Synopsis

Design I – Digital and Material Fabrication explores physical and digital computational techniques used to develop the architectural qualities of different material systems adapted for specific climatic contexts. Digital models will explore possibilities in response to various environmental parameters while physical models will explore the integration of material behaviour and robotic fabrication processes. Techniques derived from the concepts and knowledge of the hierarchical organisation of biological systems and computational models, developed in the seminar Course 'Natural Systems and Biomimetics', will be implemented. The opportunities and limitations of selected robotic fabrication techniques will be associated with the material organization, fabrication, and assembly workflows of a one-to-one scale working prototype.

Aims

The purpose of Design I is to design and develop computational workflow techniques, analyse, and fully fabricate material systems that are situated within EmTech research agenda. The proposed structures should offer a clear spatial layout, and they should be self-standing. Physical models employing various techniques (laser cutting, CNC milling, 3d-printing) will be constructed for the entire structure design at 1:10 scale, while a component / aggregation of components that constitute a part of the structure will be developed at 1:1 or 1:2 scales.

Content

- Stage 1: Robotic fabrication workshop
- Stage 2: System Design
- Stage 3: Material Prototyping

Learning Outcomes

- A2: Understanding of materials/material processes, modelling and digital fabrication techniques.
- B5: Development of experimental method and strategies in physical and digital experiments.
- B7: Demonstration of the capacity to apply acquired knowledge and techniques in a creative and innovative way to a material system.
- A3: Assimilation and familiarity with advanced digital and mathematic design techniques.
- A4: Assimilation and familiarity with advanced digital structural and environmental analysis.
- A4: Assimilation and familiarity with robotic fabrication techniques.
- C1: A thorough knowledge of the specific concepts, techniques and practices in the field of Emergent Technologies and their effects on the production of built architectures and artefacts.
- C4: The ability to connect analysis to design philosophies and material strategies, and relate them to processes of production.

Submission

- Team Document submission
- Integrated Computational Pipeline (implemented as a Grasshopper plugin)

Assessment Methods

Document assessments are carried out independently by at least 2 Programme Staff.

The document presents the aims of the Design Studio, the logics and processes developed and the analysis of their properties and performance in relation to goals of the design project. The relationships between the environmental context, morphological models, and physical prototyping with embedded material properties will be interrogated. Computational models will be used to discover environmental, geometrical, material, and morphological interrelationships to create a hierarchical system of design. Material experimentation coupled with digital prototyping will be used to generate full scale prototypes to analyse and document the relations between computational and physical paradigms. The team dossier includes a critical account of the experiments, its rationale, and context and a set of physical, computational and analytical models. It is expected that the document clearly presents observations and critical reflection of the experiments.

Grasshopper component submission (Team): A custom-made Grasshopper component (.gha) that performs specific computational tasks, mathematical operations, or geometric transformations that are specific to the computational system explored in the seminar course.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context and analysis
The work demonstrates a systematic understanding and critical awareness of the concepts, strategies, and analytical tools of Design I. Appropriate critical and/or technological precedents, contextual factors, methodologies, practices and/or tools inform the parameters of the brief, satisfying specific contextual and analytical requirements.

Process and synthesis
Research into the appropriate contextual, critical and/or technological precedents, methodologies, practices and/or tools is synthesised into the design process, allowing for creative decision-making, inventive design strategies, experimentation and originality. The work demonstrates knowledge and skills of geometrical and topological analysis, digital morphogenesis and computational design processes, material behaviour, robotic fabrication techniques and assembly processes, and the appropriate deployment of that knowledge and skills in an integrated process. Feedback is integrated into a self-directed design process that demonstrates criticality and independent learning skills, and the ability to work in a group where necessary, required for continuing professional and academic development.

Resolution and clarity of communication
Design proposals are resolved to a satisfactory standard based on the functional criteria and/or project themes set by the brief, with appropriate methodologies deployed in the production of appropriately ambitious propositional design work. Project work is organised, structured and communicated effectively through a range of considered representational methods and visual, verbal and written skills.
The work elucidates hypothesis, research, and experimentation in an analytical manner, evidencing the ability to construct and maintain a critical position, and the skill to place this in the theoretical context of Design Science. The work is structured and organised effectively, demonstrating good use of written and visual communication skills and the independent learning ability required for continuing professional development.

TITLE	CORE MODULE 3a – EMERGENCE AND EVOLUTIONARY COMPUTATION		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Milad Showkatbakhsh, Anna Font, Abhinav Chaudhary, Danae Polyviou, Paris Nikitidis, Krishna Bhat	Term Credits	2 10
Learning Methods	Lectures Seminars Tutorials Juries Self-directed learning	Workload	100 hours study, inclusive of teaching contact: 25 hours teaching/75 hours self-directed study

Synopsis

Evolutionary Algorithms have been used extensively in recent years to mimic the principles of evolutionary science to solve common real-world problems through search and optimization procedures of single or multiple objectives. Ranging from the fields of economics to politics and music to architecture, evolutionary algorithms have proven to be an efficient problem-solving technique to find multiple trade-off solutions for problems that possess multiple 'fitness criteria' (objectives) that are in conflict with one another.

Aims

The aim of the seminar is to introduce the concept of biological intelligence as well as to develop an understanding of its application in design primarily through the development of architectural and urban morphologies. The experimentation phase that comprises the seminar will provide the necessary knowledge for the utilisation of multi objective evolutionary algorithms across a range of scales as well as varying degrees of complexity. Although challenging, once mastered, their application becomes a robust tool in addressing design problems comprising multiple conflicting objectives that hold no clear single design solution.

Content

- Stage 1: Experiment I – Morphological Variation of Towers
- Stage 2: Experiment II – Employing sequential simulation techniques to inform the design and performance optimisation of façade systems for morphologically evolved towers.

Learning Outcomes

- A1, B1: Have acquired knowledge of the concepts and philosophies in the field of Emergence, and their potential for the design and production of materials, structures and forms.
- C1: Have acquired an understanding of the basis of Evolutionary Computation and Generative Design;
- B5: Have developed an ability to design an 'experiment' using evolutionary computation tools to generate forms and structures, and to use physical modelling to test and evaluate the results.
- B4: Have acquired skills in working in Evolutionary Computation and digital design;
- B3, C5: Have acquired skills in the documentation and presentation of the aims and context of the design experiment, the process, products and the analysis of the results.

Submission

- Team Document submission
- Individual Essay (1,000 words)

- Integrated Computational Pipeline (implemented as a Grasshopper plugin)

Assessment Methods

Document assessments are carried out independently by at least 2 Programme Staff.

Document Submission (Team): The document presents the aims of the design experiments, the logics of the processes, the Towers and associated System Territories that have been generated, and the analysis of properties and performance. Each Sequence of the generative experiment is to be presented in the document, together with the initiating and revised computational strategies made between each Sequence and the rationale for them. It will also include a full data set of the modelled Tower morphologies and their façade systems, their ranking in populations, their emergent spatial phenomena, and a reflection on the potential variations needed for placement in differing climates.

Grasshopper component submission (Team): A custom-made Grasshopper component (.gha) that performs specific computational tasks, mathematical operations, or geometric transformations that are specific to the computational system explored in the seminar course.

Document Submission (Individual): Each team member will submit a 1000-word paper (no more than 1200 words) that presents a personal critical review of the 2 sequences, alongside a detailed account of the approach undertaken and results achieved in the individual experiments conducted in sequence 1. The purpose of this submission is to ensure that each student has a comprehensive understanding of the theoretical and technical knowledge gained throughout the seminar; therefore, situating your work within the field of research is essential in displaying a clear understanding of the significance of the work presented. More importantly, a considerable part of conducting such experiments is acquiring the necessary skills to present your findings to your peers in a concise yet clear manner. This is an essential skill to be gained for publishing your work in peer reviewed journals and conferences. As such, each paper must be structured to include an Introduction, Background and Context, Methods, Experiment Setup, Results and Conclusions.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context and analysis
The work demonstrates a systematic understanding and critical awareness of the concepts of Emergence and Evolutionary Computation, of the strategies for applying different algorithmic approaches to design, and the use of analytical tools for the evaluation of outputs. Appropriate critical and/or technological precedents, contextual factors, methodologies, practices and/or tools inform the parameters of the brief, satisfying specific contextual and analytical requirements.

Process and synthesis
Research into the appropriate contextual, critical and/or technological precedents, methodologies, practices and/or tools is synthesised into the design process, allowing for creative decision-making, inventive design strategies, experimentation and originality. The work demonstrates knowledge and skills in the clear formulation of aims for computational design experiments, and an ability to plan and pursue a research agenda in Evolutionary Computation. Feedback is integrated into a self-directed design process that demonstrates criticality and independent learning skills, and the ability to work in a group where necessary, required for continuing professional and academic development.

Resolution and clarity of communication
Design proposals are resolved to a satisfactory standard based on the functional criteria and/or project themes set by the brief, with appropriate methodologies deployed in the production of appropriately ambitious propositional design work. Project work is organised, structured and communicated effectively through a range of considered representational methods and visual, verbal and written skills. The work elucidates hypothesis, research, and experimentation in an analytical manner, evidencing the ability to construct and maintain a critical position, and the skill to place this in the theoretical context of Emergence. The work is structured and organised effectively, demonstrating good use of written and visual communication skills and the independent learning ability required for continuing professional development.

TITLE	**CORE MODULE 3b – DESIGN II: ECOLOGICAL URBAN DESIGN**		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Milad Showkatbakhsh, Anna Font, Abhinav Chaudhary, Danae Polyviou, Paris Nikitidis, Krishna Bhat, Michael Weinstock	Term Credits	2 15
Learning Methods	Lectures Seminars Tutorials Juries Self-directed learning	Workload	150 hours study, inclusive of teaching contact: 30 hours teaching/120 hours self-directed study

Synopsis

Design II: Ecological Urban Design is focused on creating new design experiments and system logics for ecologically sensitive settlements with urban tissues in extreme climates and ecological contexts. It is founded on the logic that the patterns of human inhabitation are determined by the needs of the infrastructure of the ecology - designed, grown and developed as integrated natural and cultural systems, with the ambition to be resilient to change. Initial design experiments will be conducted to test generative algorithms for network patterns for the distribution of infrastructural networks, settlement units, and public facilities. The variations and combinations of these aggregations will be quantified for their potential capacities and performance. Various types of analyses (CFD, environmental, syntactical) will accompany the generative network algorithms to analyse and evaluate their performance, which in return will feedback into the design workflows with an iterative logic. Experiments will be set up for the design of the self-sustaining settlement. The developed Design Proposal will demonstrate the capacities for adaptation over time and extreme weather events for the proposed infrastructures with the associated architectural morphologies in their ecological context.

Aims

Each team will design a new self-sustaining settlement, as part of an ecological tissue for 1,000 people capacity, situated within the given extreme biome. The design proposals are going to explore:

- Infrastructures of land and sea that explore connectivity and communication within the site and beyond,
- An organisation of variable settlement morphologies, associated public facilities and productive territories with their own spatial, programmatic patterns and effects,
- An articulated design of the architectural proposal detailing the structural and environmental parameters, material system, and performance.

Content

- Stage 1: Design Strategy
- Stage 2: Design Experiments
- Stage 3: Design Proposal

Learning Outcomes

- B1: Have further developed their knowledge of the evolutionary computation techniques and multi – parameter analysis, and have developed skills in their use.
- B2: Have acquired knowledge and skills in ecological analytical techniques and be able to develop appropriate strategies for inhabiting and regulating ecological systems;

- B6: Have acquired skills in synthesis of collated climatic and ecological data with design ambitions, be able to integrate those skills in the strategic choice and optimisation of strategies and design development.
- C1: Have developed knowledge and skills in advanced generative computation and be able to deploy those skills.
- C5: Have developed knowledge and skills in the analysis and evaluation of morphological systems for a range of complex urban ecological conditions; and be able to deploy those skills appropriately.

Submission

- Team Document submission
- Interactive Stand Alone Application (Developed in Unity)

Assessment Methods

Document assessments are carried out independently by at least 2 Programme Staff.

Document Submission (Team): The document presents the aims of the Design Studio, the logics and processes developed and the analysis of their properties and performance in relation to goals of the design project. The relationships between the environmental context, settlement scale, and morphological models with embedded material properties will be interrogated. Computational models will be used to discover environmental, geometrical, material, and morphological interrelationships to create a hierarchical system of design. The team dossier includes a critical account of the experiments, its rationale, and context and a set of computational and analytical models. It is expected that the document clearly presents observations and critical reflection of the experiments.

Unity app submission: Unity application that effectively communicates the details and purpose of your project through data-driven processes and clever visualizations. The application should make use of custom and user-enabled animations, time-based simulations and intuitive UI to enhance the overall user experience and better convey the functionality and design of your project. Additionally, you are required to provide a comprehensive explanation of your project's methodology (using text, images, videos), including any physical or digital experimentation you conducted, as well as your design approach and the influence of a constantly changing environmental, cultural and economical context. It is imperative that your final product is not only technically sound and effectively presenting the information in a clear and concise manner, but also making it accessible and easily understandable for an uninformed user through an intuitive user interface (UI).

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context and analysis
The work demonstrates a systematic understanding and critical awareness of the concepts of Design II. Appropriate critical and/or technological precedents, contextual factors, methodologies, practices and/or tools inform the parameters of the brief, satisfying specific contextual and analytical requirements.

Process and synthesis
Research into the appropriate contextual, critical and/or technological precedents, methodologies, practices and/or tools is synthesised into the design process, allowing for creative decision-making, inventive design strategies, experimentation and originality. The work demonstrates knowledge and skills in the analysis, digital morphogenesis and evolutionary computational design processes, and the appropriate deployment of that knowledge and skills in an integrated process of design for a large urban ecological patch. The work demonstrates the ability to place the gained knowledge and skills in an appropriate ecological, climatic and cultural context. Feedback is integrated into a self-directed design process that demonstrates criticality and independent learning skills, and the ability to work in a group where necessary, required for continuing professional and academic development.

Resolution and clarity of communication
Design proposals are resolved to a satisfactory standard based on the functional criteria and/or project themes set by the brief, with appropriate methodologies deployed in the production of appropriately ambitious propositional design work. Project work is organised, structured and communicated effectively through a range of considered representational methods and visual, verbal and written skills. The work elucidates hypothesis, research, and experimentation in an analytical manner, evidencing the ability to construct and maintain a critical position, and the skill to place this in the theoretical context of Emergence. The work is structured and organised effectively, demonstrating good use of written and visual communication skills and the independent learning ability required for continuing professional development.

TITLE	CORE MODULE 4 – CRITICAL DISCOURSES		
Level Teaching Staff Learning Methods	FHEQ Level 7 Alvaro Velasco Perez Lectures Seminars Workshops Tutorials Juries Self-directed learning	Status Term Credits Workload	Compulsory 1, 2, 3 10 100 hours study, inclusive of teaching contact: 30 hours teaching/70 hours self-directed study

Synopsis

Gathering knowledge from architecture, social and natural sciences, computation and evolutionary theories, the design method of EmTech lies at the crossroads of various disciplines, each of which has its own historical trajectories and canons - written and built. Yet, at moments these trajectories intersect, overlap and concur. Intersections of Historical Trajectories provides a space of discussion where students will critically engage with historical narratives, empowering them to situate their work within existing fields of knowledge. The aim is to enable the student understanding his or her own personal within an extended field of knowledge in which to discuss ideas with other authors.

Aims

The aim of the seminars is three-fold. First, the course will equip the students with the skills of self-reflection and critical perspective on the history of the discipline. Second, a set of research tools will be explained and put into practice that will provide the students with multiplicity of research methodologies. These different research strategies will be developed in consonance with other seminars in which research and writing are involved. Third, it provides a space for students to develop their writing and research skills that will feed into their final dissertation, making emphasis on reading and academic writing standards.

Content

- Term 1: intersecting past trajectories (emergence of the digital, the environmental crisis, ecologies, techno-utopias)
- Term 2: contemporary bifurcations (culture of research, digital craftmanship)
- Term 3: preparation of the dissertation

Learning Outcomes

- B3: Demonstration of clear structure, precise writing and presentation of work; referencing of sources, information using agreed conventions.
- B4, C1: The development of critical faculties and an understanding of the effect that certain concepts and practices have had on the architectural discipline and its built products.
- B7, C2: Capacity to apply acquired knowledge in a creative and innovative way to a general architectural historical and theoretical field.
- C5: Skills in pursuing architectural research and presenting these findings individually or as part of a group.

Submission

- Individual Essay (1,000 words)

- Team Essay (3,000 words)

Assessment Methods

Document assessments are carried out independently by at least 2 Programme Staff.

Document Submission (Individual): 1,000-word essay defining the topic of interest for the dissertation integrating the use of research tools developed during the seminars. Informal verbal feedback, not formal written assessment, will be provided.

Document Submission (Team): 3,000-word essay. The team of students will carry out research on a particular topic of their interest, connected to their dissertation. This should gather multiple historical trajectories that intersect in specific cases of study. The text will develop their own personal thread that puts in relationship that variety of cases under one argument. After submission of the essay, this research will help informing the literature review and the cases of study for the 'domain chapter' of the dissertation.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Research and knowledge acquirement
Research into the chosen area of study is independently undertaken, demonstrating a comprehensive understanding and critical awareness of the relevant social, political, historical, theoretical, economic, environmental and/or ethical contexts, concepts, ideas and/or precedents at the forefront of the discipline, being addressed through systematic enquiry.

Approach and development
The work submitted demonstrates an inventive and original approach to the consolidation and development of research, with a consistent process of synthesising acquired knowledge is evidenced in the work. The structures, methods and/or tools utilised in the production of the work demonstrate initiative, self-directed learning, the ability to work in a group where necessary, and the skills to make complex decisions. The work demonstrates the ability to work independently and in a group where necessary, integrating and synthesising contextual information and acquired knowledge through a systematic method, evidencing self-direction, originality and the ability to respond critically to the subject matter.

Argument and communication
The work demonstrates the ability to devise and sustain complex arguments, contextualised effectively in a wider field of relevant ideas with a critical position determined. Conclusions and/or reflections are well executed, with good judgement shown in the absence of complete data. Written and visual communication skills are evidenced to a high standard throughout, and the work demonstrates the abilities developed to undertake further research.

TITLE	**CLIMATE AND ECOLOGICAL SYSTEMS IN DESIGN SCIENCE**		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Michael Weinstock, Milad Showkatbakhsh	Term	1 and 2
Learning Methods	Lectures Seminars Tutorials Juries Self-directed learning	Credits Workload	10 100 hours study, inclusive of teaching contact: 20 hours teaching/80 hours self-directed study

Synopsis

Various models, methods and techniques, founded on the sciences of climate and ecology, have been developed over time to address systems and design strategies at different urban and architectural scales. These models concentrate on quantifying, examining, and analysing dynamics of energy, information and material flows of the climate and ecological systems.

The Scientific Method is an evolving set of procedures based on systematic observations and measurements, the formulation of ideas (hypotheses), and predictions from those observations that are tested by experiment, the subsequent modification of hypotheses and further experimentation until there is no distance between the hypothesis, predictions and observed results from the experiment.

Design Research is a unique class of enquiry that may include some combination from the larger set of principles of form and behaviour, integrated knowledge from the natural or cultural sciences, a specified degree of mutability such as a relational model capable of adaptation to differing circumstances or environments, testable propositions and principles of implementation, and an expository design (conceptual, physical or computationally simulated) to be used for testing and evaluation.

Aims

The aim of the course is to introduce scientific inquiry and ecological system thinking and modelling into Design Science and Design Research.

Content

There are 7 seminars in the series, all taking place in Term 1 and 2.

- Design Science and Ecological Systems – Introduction and systems overview: Hypothesis, Theory, Law, Logic, Models, Evidence (experimental/empirical), Experiments, Quantitative and Qualitative and Mixed methods, Reasoning (logic and styles of arguments) - Inductive, Deductive and Adductive, Uncertainty and Bias.
- Design Science - Origins and Methods, Theories and Models: examples including Gases, Climate and Evolution.
- Ecological Systems in Nature and Civilisation: Biomes, Habitats, scales, metrics and dynamics of change.
- Metabolism and Energy Flow in Ecological Systems in Nature and Civilisation.
- Ecological Modelling Approaches and Computational Tools.
- Anatomy of a Literary Review for a Paper, Dissertation and Thesis in the Sciences.
- Seminar discussion and critical reflection of initial outline proposals.

Learning Outcomes

- (B1) Formulation of research hypotheses and primary / secondary research questions that are pertinent to design science knowledge.
- (B4, C3) Ability to conduct precedent research and literature review based on data, long proofs, code or other “methods” information, and any supplementary material.
- (B3) Ability to develop a structured paper that includes an abstract, introduction, methods, results, discussion, and conclusion.
- (C2, C5) Ability to formulate a set of methodical critical reflections, limitations, and opportunities for further research.

Submission

- Research proposal (2,000 words)

Assessment Methods

Document assessments are carried out independently by at least 2 Programme Staff.

Document Submission (Individual): An individual 2,000-word detailed Research Proposal on a research topic selected by the student is to be submitted that explores aspects covered in the seminar course. The detailed research proposal contains domain study and literature review, method statements, and design of experiments for the submission. The document situates the work in relation to the Scientific Method and Design Research enquiries. It comprises hypotheses, predictions from hypotheses that are tested by experiment, and subsequent modification of hypotheses and further experiments until the hypothesis, predictions, and observed results from the experiment are aligned with each other.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context and analysis
The work demonstrates a systematic understanding and critical awareness of relevant contextual factors such as site conditions, social, political, historical, economic, environmental and ethical issues that influence the technical strategy developed in the project and its overall impact on the climate where necessary. A range of critical precedents, methodologies, practices and/or tools at the forefront of the discipline are investigated to inform the environmental and technical parameters of the brief.

Approach and synthesis
An integrated technical, environmental and aesthetic method is demonstrated through the application of research into precedents, contemporary technologies, materials and processes. Environmental and technical knowledge acquired and/or findings are synthesised into a self-directed and critical decision-making process, demonstrating originality in tackling problems, an informed approach toward a regenerative approach to design, independent learning and the ability to work in a group if necessary, and the skills required for continuing professional and academic development.

Resolution and communication
The work demonstrates the ability to analyse and refine technical concepts, communicating sound judgements and a critical understanding of the implications of technical design decisions at a range of scales over the lifecycle of the project. Through resolution, the project addresses the aesthetic, programmatic and functional requirements of the brief. The work is structured and organised effectively and communicated through advanced visual, verbal and written communication techniques.

TITLE	CORE STUDIO/THESIS – THE DISSERTATION		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Milad Showkatbakhsh, Anna Font, Abhinav Chaudhary, Danae Polyviou, Paris Nikitidis, Krishna Bhat, Michael Weinstock	Terms Credits	3 and 4 100
Learning Methods	Lectures Seminars Tutorials Juries Self-directed learning	Workload	1,000 hours study, inclusive of teaching contact: 80 hours teaching/920 hours self-directed study

Synopsis

The Dissertation is a written and illustrated account of an original inquiry in design research, pursued through a close and careful study that is structured to yield new designs, or to integrate existing designs into a new synthesis. The activity of designing constitutes a crucial mode of research specific to the architectural discipline. The enquiry takes place within the context of the design studio. Architectural designs that contribute to knowledge are those that lead to new perceptions, to new material forms and processes, to the development of new architectural and urban systems, to new constructs that advance the existing understanding and quality of the built environment.

Within the field of Emergent Technologies and Design it is expected that quantifiable scientific knowledge will provide the appropriate model of study that may be coupled to appropriate culture models.

MSc students produce their 10,000 – 15,000-word Dissertation, and a large-scale working prototype of their partial/entire architectural system, for submission at the end of the 12-month programme.

Aims

The Dissertation Research Studio is focused on extending the acquisition of research competencies and their application to advanced production in architecture, urbanism, and ecological engineering. Students further develop their abilities to analyse complex issues and to engage in independent research, integrating insights gained from case studies with insights gained from Digital and material experiments. Students integrate explorations of the theoretical discourses, relevant sciences and case studies of 'state of the art' projects in the domain of their chosen topic and set out the methods and protocols for the development of their Design Proposal. The development and conclusion of the final proposal is pursued through the iterative design cycles that students have acquired knowledge and skills in during the early phases of the programme.

The form in which the Dissertation is to be presented includes text, illustration, and original unique three-dimensional designs. Design research will necessarily be supplemented and substantiated by various scientific methods of analysis and evaluation. The design will be expressed and evaluated with respect to these scientific methods, and accompanied by textual exegesis that situates, frames, and communicates the contribution to the field of architectural design.

Design research is usually situated in one of the two main fields of investigation, but it may be a hybrid that combines some aspects from the other. Students work in pairs for the Dissertation, and individually on further development of their personal Critical Reflection that completed the Studio portfolio. The principal domains of our design research are positioned at the confluence of two major research trajectories:

- **Dynamic Material Systems with Advanced Fabrication** – focused on advanced fabrications and assembly technologies applied at the scale of medium/large buildings and/or landscapes.
- **Ecological Urban Design in Emergent Biomes** - focused on algorithmic design for energetic models of new cities and settlements and their integrated technologies at the scale of an ecologically defined landscape such as a shoreline, river valley, delta or hillside.

Learning Outcomes

- A1: Assimilation of the programme material and familiarity with concepts, techniques, and strategies in the field of Emergence.
- A2: Assimilation and familiarity with material processes and advanced manufacturing techniques.
- A3: Assimilation and familiarity with advanced digital and mathematical design techniques.
- A4: Assimilation and familiarity with advanced digital structural and environmental analysis.
- B1: Demonstration of clear and appropriate formulation of hypotheses and arguments, and the ability to deploy these for the planning and pursuit of a research agenda.
- B2: The ability to conduct comparative analysis and produce meaningful generalization.
- B3: Demonstration of clear structure, precise writing and presentation of work; referencing of sources, information using agreed conventions.
- B4: The development of critical faculties and advanced design skills.
- B5: Demonstration of judgment and appropriate application of research material and technical knowledge to design and material experiments.
- B6: Demonstration of capacity to apply acquired knowledge and techniques in a creative and innovative way to a comprehensive architectural design and to its material construction.
- B7: Demonstration of capacity to apply the acquired knowledge and techniques in a creative and innovative way to a general architectural construction type and material system, or to a developed and tested generative strategy of architectural design.
- C1: A thorough knowledge of the specific concepts, techniques and practices in the field of Emergent Technologies and their effect on the production of built architectures and artefacts.
- C2: Capacity for critical and technical analysis.
- C3: The ability to construct Case Studies by applying critical and technical analysis to historical modes of construction.
- C4: The ability to connect analysis to design philosophies and material strategies and relate them to industrial processes and production.
- C5: Skills in developing and pursuing architectural and technical research in the field of Emergent Technologies, and in presenting research findings individually and as part of a group.
- C6: The ability to contribute to interdisciplinary professional teams.

Submission

- Large-scale working prototype
- Dissertation (team submission) (10,000 – 15,000 words), including:
  - Abstract: The original proposal, which will be revisited several times as the work progresses.
  - Introduction: Written last.
  - Map of Individual Contributions to the Dissertation and short commentary.
  - <u>Chapter 1</u> - The Domain: the topic or area to be investigated, including precedents and the physics of the topic. This concludes with the precise design problem or question that is to be tested and developed. This must be a sharply defined question - not a general discussion, for example, on metabolism or network topology. Precision requires definitive statements of the parameters that control or limit the work, its contribution to the field and the means by which it will be measured.
  - <u>Chapter 2</u> - Methods: the methods and techniques that are the current state of the art in the profession and in research, the digital and physical techniques you intend to use in your investigation, their relation to the 'state of the art', and how you have tested their effectiveness and calibrated them.
  - <u>Chapter 3</u> - Research Development: the first experiments, digital and physical, and their evaluation, and how they give an insight to the concluding statements of the Domain Chapter - and have contributed to the refinement of the research question.
  - <u>Chapter 4</u> - Design Development: more complex design experiments at higher systems level.
  - <u>Chapter 5</u> - The Design Proposal: the final proposal in all its detail.

- Chapter 6 - Evaluations and Revisions/Future Development.
- Critical Reflection (individual).

Assessment Methods

Document Submission (Team): The final MSc Dissertation will be submitted by the end of the fourth term. All submissions are assessed and marked by two members of the programme's teaching staff.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context, analysis and knowledge acquirement

- The work demonstrates a systematic understanding and critical awareness of relevant contextual factors such as site conditions, social, political, historical, economic, environmental and ethical issues. Analysis is undertaken in relation to the needs of the intended user groups and the complexities of the location. Appropriate conceptual, critical and/or technological precedents, methodologies, practices and/or tools inform the parameters of the brief, satisfying specific contextual and analytical requirements.
- The work analyses and reflects upon developments and insights at the forefront of the profession of architecture. Relevant contextual information and/or precedents are critically evaluated in order to inform the parameters of an appropriately clear and complete representation of the subject matter.

Process, approach, integration and synthesis

- Research into appropriate contextual, conceptual, critical and/or technological precedents, methodologies, practices and/or tools is synthesised into the design process, allowing for creative decision-making, inventive design strategies, experimentation and originality, explored from both user and designer perspectives. The work demonstrates clear and appropriate formulations of hypotheses and arguments, and the ability to deploy these in the planning and pursuit of an original and creative research agenda in the field of Emergent Technologies.
- Feedback is integrated into a self-directed design process that demonstrates criticality and independent learning skills, and the ability to work in a group where necessary, required for continuing professional and academic development.
- An integrated technical, environmental and contextual method is demonstrated through the application of research into precedents, contemporary technologies, materials and processes. Environmental and technical knowledge acquired and/or findings are synthesised into a self-directed and critical decision-making process, demonstrating originality in tackling problems, an informed approach toward a regenerative approach to design, independent learning and the ability to work in a group if necessary, and the skills required for continuing professional and academic development.
- The work demonstrates the ability to work independently and in a group where necessary, integrating and synthesising contextual information and acquired knowledge through a systematic method, evidencing self-direction, originality and the ability to respond critically to the subject matter.

Resolution and clarity of communication

- Design proposals are resolved to a satisfactory standard based on the functional criteria and/or project themes set by the brief, with appropriate methodologies deployed in the production of appropriately ambitious propositional design work. Project work is organised, structured and communicated effectively through a range of considered representational methods and visual, verbal and written skills. The MSc Dissertation is required to demonstrate the capacity to apply the acquired knowledge and techniques in a creative and innovative way to a set of architectural or urban forms that are developed within an ecological system, to a resolution sufficient to evaluate and refine the system level processes and performances central to the research questions.
- The work demonstrates the ability to analyse and refine technical concepts, communicating sound judgements and a critical understanding of the implications of technical design decisions at a range of scales over the lifecycle of the project. Through resolution, the project addresses the contextual, environmental, programmatic and functional requirements of the brief. The work is structured and organised effectively and communicated through advanced visual, verbal and written techniques.

- The work elucidates hypothesis, research, and experimentation in an analytical manner, evidencing the ability to construct and maintain a critical position, and the skill to place this in the theoretical context of Emergence. The work is structured and organised effectively, demonstrating good use of written and visual communication skills and the independent learning ability required for continuing professional development.

TITLE	DESIGN AND BUILD		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Milad Showkatbakhsh, Anna Font, Abhinav Chaudhary, Danae Polyviou, Paris Nikitidis, Krishna Bhat, Michael Weinstock	Term	2, 3, 4
		Credits	0 (Supporting programme content)
Learning Methods	Lectures Seminars Tutorials Juries Self-directed learning		

Synopsis

Design & Build is our 'extracurricular' collaborative student project, and is an essential part of the pedagogy and culture of EmTech. It runs right through the year, alongside both Studio and the Dissertation, and provides opportunities to design and deliver a built project with real material, structural, fabrication and assembly constraints. The experience gained enhances the design, computational and analytical skills students have acquired in Studio, and it develops crucial transferrable skills that are applicable to professional practice. Our Design & Build projects have been published internationally in the architectural press since 2001, and have received industry awards.

Aims

Building on the programme's knowledge and research of composite material systems, each year Emtech cohort takes part in the design, detailing and construction of a performative structure or pavilion. The first stage comprises of several groups of students organising and entering into an intense design competition for a proposal to be designed, fabricated and built as a composite structure, employing a single material system or integrating multiple material systems. The material system should be designed and fabricated using a combination of digital and robotic fabrication strategies. The winning design is developed throughout Terms 2 and 3, including comprehensive drawings, construction detailing, and assembly sequences. Each year the final one-to-one scale prototype is installed at the AA Projects Review and/or elsewhere.

Content

- Stage 1: Design Competition among teams
- Stage 2: Formation of new teams, and research development in:
    - Computational experimentation
    - Material experimentation
    - Assembly planning
    - Construction detailing
    - Material and cost planning
- Stage 3: Assembly of prototype

Learning Outcomes

- A1: Understanding advanced algorithmic thinking and iterative design processes.
- A3: Interrogation of material systems through physical material experiments and then transforming the outputs of these experiments into computational models as a form of recalibration between physical and digital experiments.
- A4: Analysing and evaluating local, regional, and global scale experiments through multiple performance-based criteria, including but not limited to Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD), and various environmental analyses.

- B6: Developing knowledge and skills in advanced generative computation and be able to deploy those skills.
- B7: Building associative logics between distinct computational models across global, regional, and local component scales, and formulating hierarchies between form, orientation and geometry in order to address multiple design parameters.
- C1: Having the ability to build computational models that focus primarily on material behaviour, fabrication techniques, fabrication tolerances, and assembly processes.
- B3, C5: Having the ability to measure, photograph, diagram and document the successes and limitations of the research agenda through written and graphic methods.

Submission

- N/A

SECTION 5:

MSc IN LANDSCAPE URBANISM

5.1 PROGRAMME INTRODUCTION

Landscape Urbanism is a Graduate Design Programme at the Architectural Association leading to a Master of Science (MSc, 12 months) in Landscape Urbanism.

The programme explores the role that designs and designers – from architects and landscape architects to urban designers and planners – can play when confronted with the processes, landscapes and territories of planetary urbanisation (metropolitan areas, rural environments, infrastructural and productive landscapes, etc) and the environmental, racial, socio-economic and health-related crises they have triggered. Planetary urbanisation is structured by an economic model based on policies that have been shaped by 'human relations of power, production, and environment-making in the web of life'. In this context, LU explores the design, beyond normative aesthetic and performative proposals, as a mechanism to shape progressive policies with which to orchestrate, choreograph and negotiate political and economic frameworks to avert the contemporary ecological crisis. To this end, LU is inherently transdisciplinary, integrating critical thinking at its core and knowledge coming from practices including policymaking, political ecology, cartography, environmental history, ecological economics, scripted simulations and participatory tools. Alongside this, various forms of media representation are explored to ensure the design of policies is widely available and accessible to the general public. Beyond the design of single buildings or pieces of urban design, AA Landscape Urbanism is interested in designing policies that directly impact landscapes to develop, organizational models, innovative regulatory plans and visual decision-making tools with the capacity to integrate design within world-ecology frameworks. The aim of the programme is to contribute to the enhancement of the discipline by making it more relevant to wider conversations, dialogues and debates with different disciplines (geography, economy, law, ecology, political science, agroecology etc.), highlighting the unique capabilities of design to offer alternatives to the contemporary crises we are experiencing.

The programme uses as a backbone the design of policies and sees it as a potential field of design praxis. Through this lens, it operates within contemporary conditions whereby urban environments are understood as intrinsically interconnected and related webs of landscapes necessary for them to operate and with implications at local, regional, and planetary scales. This interconnectedness explains the current planetary environmental breakdown, energy crisis, water/food/land consumption and depletion, widespread pollution, and social injustices, all disguised by ecological and sustainable design-driven agendas for the urbanised world.

5.2 AIMS

Landscape Urbanism works as a design research course that explores relevant landscape and urban histories and theories methods and uses relevant landscape, cartographic and design techniques to produce critical Landscape Urbanism projects. At the end of the programme, students are expected to work as design professionals capable of handling large-scale, trans-disciplinary projects with a particular expertise on the spatial impacts policies have in the landscape design and dynamics applicable to a variety of professional disciplines such as architecture, landscape architecture, urban design and planning as well as develop skills to collaborate with organisations and think tanks working on the design of progressive policies in the UK.

The Landscape Urbanism Master in Science (MSc) degree develops the ability to comparatively analyse, interpret and propose progressive policy designs that could transform the spatial configuration of given urban landscapes for the common good. Within the programme common good is defined by the capacity to empirically demonstrate the benefits and improvement that the transformed urban landscapes bring to people and non-humans alike. To do so the MSc degree provides the framework to develop large-scale and complex landscape and territorial formations to generate a set of design guidelines (i.e. Manuals, strategic planning, organisational models,) that can potentially be deployed and transferred into comparable territories (i.e. Atlas, visual decision-making tools, participatory models). These design documents are the outcome of a research-by-design methodology based on analytical and design tools and techniques (its development and refinement) such as landscape time-lapse models, digital/physical geomorphological simulations, GIS mapping and cartographic concepts and practices, and participatory tools. These technical tools are used to facilitate the re-appropriation of landscape practices into the production of alternative and novel design policies, that could inform the planning of urban landscape projects.

The programme has as its main educational objectives the following:

- To form design professionals, able to participate in large-scale, trans-disciplinary projects with the capacity to read and analyse landscape and territorial dynamics using the latest urban theories and methodologies aided by relevant technologies.
- Approach the design of urban, landscape and territorial environments based on critical thinking and landscape/ecological models to understand, interrogate contemporary urban conditions, and project potential alternatives.
- Develop methods for long-term research on novel forms of cartographical representation, socio-economic analysis, and landscape dynamics simulation.
- Develop design methodologies that are inclusive of projects, theories, and techniques from relevant disciplines (Geomorphology, Ecological Economics, Geography) that engages with the wider disciplinary problem of policy design as a praxis and design field.

The specific educational aims of the MSc degree course are linked to the development of practices aligned to the analytic skills and research methods of landscape techniques and tools developed. These can be described as follows:

- Bridge the gap between analysis and design by integrating tools such as computer-based simulations, physical models, various forms of landscape representations and cartographic tools.
- Develop methodologies that test and evaluate design proposals using quantitative and qualitative methods to integrate the results in the workflow of the design and policy research.
- Fulfil the demands of large-scale coordination, investigations and development of urban landscapes and its frameworks where design can bring meaningful developments to challenge normative planning and policy-making practices.

5.3 LEARNING OUTCOMES

INTENDED LEARNING OUTCOMES: MSc in Landscape Urbanism; FHEQ LEVEL 7	
Learning Outcomes 'LO'	Aligned to the Framework for Higher Education Qualifications (FHEQ) and QAA Subject Benchmark (Architecture), on successful completion of the MSc in Landscape Urbanism students will be able to:
A	**Knowledge and Understanding**
A1	Develop a project brief which is critically situated within a wider architectural–landscape–urbanism policy discourse.
A2	Demonstrate a critical understanding of current theories and practice within the field of urbanism, landscape and ecology. Analyse complex territorial contexts as well as design concepts by means of a synthesis of personal and workplace reflection and data drawn from scholarship, research and personal enquiry.
A3	Evaluate complex and even contradictory theories and present their findings in a well-argued presentation.
A4	Undertake independent research with minimum guidance and synthesize that information in a well-constructed argument leading to a conclusion.
A5	Develop an understanding of socio-environmental issues.
A6	Develop an understanding of policy design and input into the design field.
B	**Intellectual Skills**
B1	Generate graphic material capable of outlining information clearly and concisely.
B2	Generate new design concepts for their project and support the achievement of desired outcomes at a professional or equivalent level.
B3	Demonstrate the ability to communicate ideas orally and demonstrate the capability to structure and show complex ideas through graphic and visual means.
B4	Write and design well-structured essays and visual essays that show evidence of independent research, make an argument clearly and effectively, present original ideas and conclusions, and use a standard style for referencing.
B5	Make use of diagrammatic drawings, 3D software, mapping and physical models to enable decision-making in complex and unpredictable situations.
C	**Research Skills**
C1	Evaluate critically current research, advanced scholarship or professional practice in the discipline or field of study.
C2	Evaluate methodologies and develop critiques of them and, where appropriate, propose new hypotheses.
C3	Plan, develop and apply research methods, retrieving and interpreting information from a wide range of sources.
C4	Synthesise design and theoretical research and report clearly, accurately and eloquently on findings.
C5	Represent and visualise clearly in design and writing.
C6	Continue to advance their knowledge and understanding, and to develop new skills at a high level.

D	**Transferable Skills**
D1	Exercise initiative and personal responsibility and accept accountability for decision-making including the use of supervision.
D2	Be able to make decisions in complex and unpredictable situations.
D3	Have achieved the independent learning ability required for continuing professional development.
D4	Be able to organise decision-making processes.
D5	Work and adapt to different team experiences, sharing, negotiating and presenting information and contributing to the formulation of a design proposal in relation to policy making.
D6	Manage others' work and adapt the course design methodology to gain insight into complex urban and territorial problems.

5.4 ASSESSMENT CRITERIA

All learning outcomes must be met in order to achieve a pass overall. The assessment of submitted work is based on the following overall assessment. The assessment of submitted work is detailed in each of the below sections of this Programme Guide. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Design Criteria
- Context and analysis
- Process and synthesis
- Resolution and communication

Technology Criteria
- Context and analysis
- Approach and synthesis
- Resolution and communication

History and Theory Criteria
- Research and knowledge acquirement
- Approach and development
- Argument and communication

Professional Practice Criteria
- Knowledge acquirement
- Integration and synthesis
- Clarity of communication

5.5 CREDIT FRAMEWORK

Term	Course Title	Credits
1	Core Module 1 – Territorial Formations (Design Studio)	20
2	Core Module 2 – Carto-Genesis (Design and Research Studio)	20
1	Core Module 3a – Models Methods and Concepts (History and Theory Seminar)	15
2	Core Module 3b – The Rhetoric of Mapping (History and Theory Seminar)	15
2	Core Module 4 – World-Ecology and Policy Design (Seminars)	15
3 + 4	Core Studio/Thesis – Design Thesis	95

5.6 TEACHING AND LEARNING METHODS

The programme's design studios, technical and computational workshops, seminars and lectures are thematically and pedagogically related, providing students with the necessary information, knowledge, skills, and guidance to undertake the required project work and complete the programme.

The programme is organized around a Design Studio which is theoretically supported by a series of Seminars and Lectures and a Field Trip to collect and verify data. The Design Studio is based on a series of weekly tutorials and intensive workshops. Both Design Studio and Seminars and Lectures provide individual and group tutorials and teaching available throughout the academic year, and on a more limited basis from July to September.

The principal process of learning in the programme is the development of the students' personal and team agendas throughout the year, which starts with a series of short-term group workshops in Term 1, tailored to acquire a wide range of tools and geared toward long-term group proposals. It then moves to the development of group agendas in Terms 2 and 3 for group projects to focus during Term 4 on the development of design documents leading to a design thesis during summer.

The learning processes of the programme can be summarised as follows:

- Undertaking design research, which must be completed and presented at given stages of the programme.
- Attending prescribed lectures and participating in seminars which include readings and group discussions.
- Researching, designing and writing individual essays related to core seminars and lectures.
- Taking part in field trips and workshops.
- Attending open lectures and other special events organised by the AA
- Preparing digital and physical portfolios.
- Preparing a printed and bound document of the individual design development by Terms 1 and 2 and group design thesis by the end of the programme.
- Distinguishing between studio group work and deliverables from individual work and deliverables. An important aspect of the programme is the opportunity for students to experience both individual research and collaborative research which is clearly outlined in the assessing methods of each individual course.

5.7 COURSES

TITLE	CORE MODULE 1 – TERRITORIAL FORMATIONS (DESIGN STUDIO)		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Jose Alfredo Ramírez, Eduardo Rico, Clara Oloriz, Daniel Kiss, Sheng-Yang Huang	Term	1
		Credits	20
Learning Methods	Tutorials Juries Self-directed learning	Workload	200 hours study, inclusive of teaching contact: 48 hours teaching/152 self-directed study

Synopsis

The first-term design studio provides an understanding of planetary urbanisation dynamics, geomorphological processes, environmental emergencies, and landscape techniques to form the methodology behind Landscape Urbanism projects. Landscape Urbanism wants to reveal and expose the processes and dynamics behind current modes of planetary urbanisation to imagine, design and project unconventional forms of territorial organisation and offer alternative scenarios to current urbanisation models. These alternative models and scenarios will rely on the historic capacity of landscapes to host, resist and modulate the struggles and contradictions between physical/environmental and the socio-political forces existing in given territories.

Aims

The aims of the first term studio is the development of students' critical thinking, design tools and methods to produce AA Landscape Urbanism projects. The design studio is composed of three distinct workshops and students are meant to collaborate with different teams in each of these workshops. During the development of the workshop a series of software tools, including Rhino, Grasshopper, GIS and Programming, will be given next to communication and representational drawing skills. Alongside the software tools and technical skills, a series of research and critical methodologies will be provided so students can produce alternative forms of visualisation in the form of critical cartographies, simulations, dynamic maps or web apps.

Content

Workshop 1: Design and Policy in the Capitalocene: This workshop highlights the intrinsic relationship between policymaking and design and enables students to understand how these processes have shaped most of the landscapes we inhabit. Students will create physical models and explore stop-motion animation techniques to visualise both the impact of existing and progressives' policies as well as the benefits or damage they could cause. With the physical models' students will explore future scenarios that describe how alternative policies can build fair and equal landscapes for the benefit of local communities. This enquiry will be supported by a series of model making sessions focusing on visualisation and design techniques.

Workshop 2: Consequential Landscapes: Consequential Landscapes workshop will seek an understanding of the processes behind today's planetary urbanisation. It explores cartographic techniques and ways in which students can visualise the multiple forms of socio-economic and political organizations and specific spatial configurations produced by current models of urbanisation. This workshop will be supported by the London Mining Network and the Visual Investigations Team from the Financial Times. The workshops will build students' connections with local communities and show them the latest knowledge and technologies in the field of spatial investigations and accountability of trans-national conglomerates and extractives corporations shaping today's planetary urbanisation.

Learning Outcomes

At the end of the course, students should be able to:

- A1: Develop a project brief which is critically situated within a wider architectural – landscape – urbanism territorial discourse
- A4: Undertake independent research with minimum guidance and synthesize that information in a well-constructed argument leading to a conclusion
- A5: Develop an understanding of environmental issues
- A6: Develop an understanding of infrastructural input into the design
- B1: Generate graphic material capable of outlining information clearly and concisely
- B2: Generate new design concepts for their project and support the achievement of desired outcomes at a professional or equivalent level

Submission

- Individual Report

Assessment Methods

Students are asked to submit an individual report of their work developed in each workshop at the beginning of term 2. This includes:

- Clearly articulate of arguments and objectives for each workshop developed.
- Relevant visual and graphic outcomes of given workshops.
- Relevant outcomes of simulations or cartographies researched.
- Explanation of specific techniques (codes and landscape representation) used during the workshops.
- Text outlining methods and outcomes.
- Images/renders and diagrams outlining the process and main outcomes.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Design Criteria:

Context and analysis
The Term 1 Design Portfolio demonstrates a systematic understanding and critical awareness of relevant contextual factors such as site conditions, social, political, historical, economic, environmental, and ethical issues applicable to the architectural, landscape and urban design projects directly linked to existing or proposed policies, planetary urbanisation processes or participatory devices. Analysis is undertaken in relation to the needs of the intended user groups and the complexities of the location and its impact into conditions at regional, national, and global scales. Appropriate conceptual, critical and/or technological precedents, methodologies, practices and/or tools inform the parameters of the argument, satisfying specific contextual and analytical requirements.

Process and synthesis
Research into appropriate contextual, conceptual, critical and/or technological precedents, methodologies, practices and/or tools is synthesised into the design process, allowing for creative decision-making, relevant design strategies, experimentation, and originality, explored from community, decision maker and designer perspectives. Feedback is integrated into a self-directed design process that demonstrates criticality and independent learning skills, and the ability to work in a group, required for continuing professional and academic development.

Resolution and communication
Design proposals are resolved to a satisfactory standard based on its response to specific policies, existing or proposed, and their deployment at multiple scales (neighbourhood, metropolitan, regional) with appropriate methodologies deployed in the production of appropriately ambitious propositional design work.

Project work is organised, structured and communicated effectively through a range of considered representational methods and visual, verbal and written skills.

Technology Criteria:

Context and analysis
The Term 1 Design Portfolio demonstrates a systematic understanding and critical awareness of relevant contextual factors such as, consequential landscapes, global supply chains, site conditions, social, political, historical, economic, environmental and ethical issues that influence the technical and policy strategy developed in the project an its overall impact on the ongoing ecological crises. A particularly important aspect is the response and relation to existing or propose polices to which the design is attached or responsive to, according to the brief. A range of critical precedents, methodologies, practices and/or tools at the forefront of the discipline are investigated to inform the environmental, policy and technical parameters of the brief.

Approach and synthesis
An integrated technical, policy and environmental method is demonstrated through the application of research into precedents, policy proposals, contemporary technologies, materials and processes. Environmental, policy and technical knowledge acquired and/or findings are synthesised into a self-directed and critical decision-making process, demonstrating originality in tackling problems, an informed approach toward a socio/environmental justice approach to design, group and independent learning and the skills required for continuing professional and academic development.

Resolution and communication
The Term 1 Design Portfolio demonstrates the ability to analyse and refine technical, environmental and policy concepts, communicating sound judgements and a critical understanding of the implications of technical, environmental and policy design decisions at a range of scales over the lifecycle of the project. Through resolution, the project addresses the policy-oriented, projective and, if applicable, functional requirements of the given project. The work is structured and organised effectively and communicated through advanced visual, verbal and written communication techniques.

TITLE	CORE MODULE 2 – CARTO-GENESIS (DESIGN AND RESEARCH STUDIO)		
Level Teaching Staff Learning Methods	FHEQ Level 7 Jose Alfredo Ramírez, Eduardo Rico, Clara Oloriz, Daniel Kiss, Sheng-Yang Huang Tutorials Juries Self-directed learning	Status Term Credits Workload	Compulsory 2 20 200 hours study, inclusive of teaching contact: 48 hours teaching/152 self-directed study

Synopsis

The second term design studio aims to develop the basis for a research-by-design thesis. A research methodology will be provided and investigations of the potential topic of the thesis will have to be aligned with the overall agenda of the year. The research will bring together geomorphological processes and social and territorial formations as the basis to formulate a Landscape Urbanism design thesis. The studio will use as a main tool, the exploration and exercise of historical and contemporary forms of cartographic representation in a broader sense which include but is not limited to maps, videos, simulations, dynamic cartographies, web apps, etc. This will serve as the basis from which to design and project an alternative form of territorial organisation and a detailed design of various aspects such as landscape and architectural typologies, spatial policies, organizational territorial models, innovative regulatory plans and visual decision-making tools that will be developed as part of the final dissertation.

Aims

The aims of this module are to develop a strong research base for the year-long project. The students should work in teams and develop independent research, which serves as the basis for further ideas and proposals in their design studio Terms 3 and 4., By the end of the studio students will be able to generate an atlas of similar and relevant territories across UK, Europe or the world, tracing the geographic problematic posed by the social and geomorphological formations outlined and researched by the student and teamwork as well as relevant documents such as cartographies, interactive tools and digital simulations.

Content

This section of the course is composed of:

- 2 weekly tutorials that help frame the project and guide the students in their production research.
- 8 GIS training sessions supplement and help students develop the relevant cartographies and maps and representation techniques.
- 8 Web app sessions to provide students with a digital tool to collect, expose and store their research and project thesis.

Learning Outcomes

At the end of the course, students should be able to:

- B3: Demonstrate the ability to communicate ideas orally and demonstrate the capability to structure and show complex ideas through graphic means.
- B5: Make use of diagrammatic drawings, 3D software, mapping and physical models to enable decision-making in complex and unpredictable situations.

- C1: Evaluate critically current research, advanced scholarship or professional practice in the discipline or field of study.
- C2: Plan, develop and apply research methods, retrieving and interpreting information from a wide range of sources.

Submission

- Group Design Portfolio

Assessment Methods

Students must submit a group Design Portfolio which outlines the aims, objectives and outcomes of their design project by the beginning of term 3. This Project portfolio includes the following:

- Research introduction and site specifics.
- Text outlining the research project aims, arguments and methodology (2000 words).
- Design experiments (workshop outcomes etc.).
- Main research lines and research outcomes.
- The layout and organisation of Research cartographies and drawings throughout term 2.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Design Criteria:

Context and analysis
The Term 2 Design Portfolio demonstrates a systematic understanding and critical awareness of relevant contextual factors such as site conditions, social, political, historical, economic, environmental, and ethical issues applicable to the architectural, landscape and urban design projects directly linked to existing or proposed policies. Analysis is undertaken in relation to the needs of the intended user groups and the complexities of the location and its impact into conditions at regional, national, and global scales. Appropriate conceptual, critical and/or technological precedents, methodologies, practices and/or tools inform the parameters of the argument, satisfying specific contextual and analytical requirements.

Process and synthesis
Research into appropriate contextual, conceptual, critical and/or technological precedents, methodologies, practices and/or tools is synthesised into the design process, allowing for creative decision-making, relevant design strategies, experimentation, and originality, explored from community, decision maker and designer perspectives. Feedback is integrated into a self-directed design process that demonstrates criticality and independent learning skills, and the ability to work in a group, required for continuing professional and academic development.

Resolution and communication
Design proposals are resolved to a satisfactory standard based on its response to specific policies, existing or proposed, and their deployment at multiple scales (neighbourhood, metropolitan, regional) with appropriate methodologies deployed in the production of appropriately ambitious propositional design work. Project work is organised, structured and communicated effectively through a range of considered representational methods and visual, verbal and written skills.

Technology Criteria:

Context and analysis
The Term 2 Design Portfolio demonstrates a systematic understanding and critical awareness of relevant contextual factors such as consequential landscapes, global supply chains, site conditions, and social, political, historical, economic, environmental and ethical issues that influence the technical and policy strategy developed in the project and its overall impact on the ongoing ecological crises. A particularly important aspect is the response and relation to existing or propose policies to which the design is attached or responsive, according to the brief. A range of critical precedents, methodologies, practices and/or tools at

the forefront of the discipline are investigated to inform the environmental, policy and technical parameters of the brief.

Approach and synthesis
An integrated technical, policy and environmental method is demonstrated through the application of research into precedents, policy proposals, contemporary technologies, materials and processes. Environmental, policy and technical knowledge acquired and/or findings are synthesised into a self-directed and critical decision-making process, demonstrating originality in tackling problems, an informed approach toward a socio/environmental justice approach to design, group and independent learning and the skills required for continuing professional and academic development.

Resolution and communication
The Term 2 Design Portfolio demonstrates the ability to analyse and refine technical, environmental and policy concepts, communicating sound judgements and a critical understanding of the implications of technical, environmental and policy design decisions at a range of scales over the lifecycle of the project. Through resolution, the project addresses the policy-oriented, projective and, if applicable, functional requirements of the given project. The work is structured and organised effectively and communicated through advanced visual, verbal and written communication techniques.

TITLE	CORE MODULE 3a – MODELS METHODS AND CONCEPTS (HISTORY AND THEORY SEMINAR)		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Clara Oloriz, Elena Luciano	Term	1
Learning Methods	Lectures Seminars	Credits	15
		Workload	150 hours study, inclusive of teaching contact: 25 hours teaching/125 self-directed study

Synopsis

This lecture and seminar-based course is concerned with the ways in which the intersections and interactions of landscape and urbanism have been thought, modelled, designed and analysed. It is designed to introduce the student to a critical engagement with these matters that will inform an understanding of the potentials and problematics of Landscape Urbanism. This, in turn, is designed to support practice and development within the studios, workshops, field trips and other seminars.

Aims

The purpose of this seminar is to introduce the main concepts which underpin the overall course ethos and methodologies. It should provide a robust framework for discussion of the development of the student projects within the studio as well as facilitate links to other seminars and parts of the course.

Content

- Session 1: Landscape: The meanings and significance of the term landscape
- Session 2: Social Formations: Venice
- Session 3: Territory, Terrain, Territorialisation
- Session 4: Consequential Landscapes and Nature
- Session 5: Infrastructure and the Urban/Rural
- Session 6: Design Agency
- Session 7: Time
- Session 8: Essay Tutorials

Learning Outcomes

At the end of the course, students should be able to:

- A2: Demonstrate a critical understanding of current theories and practice within the field of urbanism, landscape and ecology A – analyse complex territorial contexts as well as design concepts by means of a synthesis of personal and workplace reflection and data drawn from scholarship, research and personal enquiry.
- A3: Evaluate complex and even contradictory theories and present their findings in a well-argued presentation.
- A4: Undertake independent research with minimum guidance and synthesize that information in a well-constructed argument leading to a conclusion.
- B4: Write a well-structured essay that shows evidence of independent research, makes an argument clearly and effectively, presents original ideas and conclusions, and uses standard style for referencing.

- C1: Evaluate critically current research, advanced scholarship or professional practice in the discipline or field of study.
- C2: Evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses.
- C3: Plan, develop and apply research methods, retrieving and interpreting information from a wide range of sources.
- C6: Continue to advance their knowledge and understanding, and to develop new skills to a high level.

Submission

- Individual Essay (2,500 words)

Assessment Methods

Students will select projects to investigate and discuss (an overview and list of suggestions will be provided at the beginning of the term.) The submission consists of an individual visual and written essay of 2,500 words, analysing the critical content of a landscape urban project, and linking the analysis of the project to current debates within landscape urbanism, to be submitted at the beginning of term 2. Attendance and active participation to seminars and personal tutorials are mandatory requirements. The assessments include students contributions to the seminar work developed over the year.

Assessment Criteria

In acknowledging the range of student experience and interests, the assessment criteria will reflect this diversity and respond to the scholarly objectives of individual students based on the following criteria.

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Research and knowledge acquirement
Research into the chosen area for the submission of this essay and visual essay is independently undertaken, demonstrating a comprehensive understanding and critical awareness of the relevant histories and theories of social, political, historical, theoretical, economic, environmental and/or ethical contexts, concepts, ideas and/or precedents at the forefront of landscape and urban disciplines, being addressed through systematic enquiry. The student should be able to develop a critical position that echoes the works of the seminar authors while making original contribution. The submissions demonstrate analysis, contextualisation, argumentation, debate of the content of the research conducted.

Approach and development
The written and visual essay submitted demonstrate an inventive and original approach to the consolidation and development of research, with a consistent process of synthesising acquired knowledge is evidenced in the work. The structures, methods and/or tools utilised in the production of the work demonstrate initiative, self-directed learning, the ability to work in a group where necessary, and the skills to make complex decisions. It also uses a range and selection of relevant sources of information. a seminar discussion, a field trip, or an event from personal life-. In the visual essay, the student should be able to demonstrate the ability to develop a meaningful argumentation with both text and media e curation.

Argument and communication
The essay and visual essay demonstrates the ability to devise and sustain complex arguments, contextualised effectively in a wider field of relevant ideas with a critical position determined. Conclusions and/or reflections are well executed, with good judgement shown in the absence of complete data. Appropriate narrative is communicated effectively through a range of critical visual argument, adequate use of images, and other media, representational methods and visual, verbal and written skills. The research is conducted through a range, selection and use of resources, with adequate referencing. Written and visual communication skills are evidenced to a high standard throughout, and the work demonstrates the abilities developed to undertake further research. The work should be properly cited.

TITLE	CORE MODULE 3b – THE RHETORIC OF MAPPING (HISTORY AND THEORY SEMINAR)		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Clara Oloriz, Elena Luciano	Term	2
Learning Methods	Lectures Seminars	Credits	15
		Workload	150 hours study, inclusive of teaching contact: 25 hours teaching/125 self-directed study

Synopsis

This seminar addresses key points and practices in the historical development of cartography as a representational device. Methods of mapping are explored in terms of their uses, implications and potential so as to critically inform the drafting of a Carto-Genetic manifesto and the writing of the final project thesis.

Aims

The purpose of this seminar is to introduce the main concepts which underpin the practice of historical and contemporary practice of cartography. It provides a robust framework for discussion of the development of the student projects based of the representational skills but most importantly the critical approach and reflection of cartography as a medium of representation within the studio. It also aims to serve as the link between theoretical approaches and practices within cartography and within the programme.

Content

- Session 1: Projective Cartographies
- Session 2: How to assemble the globe: Radical Cartographies
- Session 3: Excavation, Archaeology and Geology
- Session 4: Cartographies of Knowledge and Power
- Session 5: Information: Dataspaces and Networks
- Session 6: Projections
- Session 7: Meta-geographies and Planetary Urbanisation
- Session 8: Essay Tutorials

Learning Outcomes

At the end of the course, students should be able to:

- A2: Demonstrate a critical understanding of current theories and practice within the field of urbanism, landscape and ecology A – analyse complex territorial contexts as well as design concepts by means of a synthesis of personal and workplace reflection and data drawn from scholarship, research and personal enquiry.
- A3: Evaluate complex and even contradictory theories and present their findings in a well-argued presentation.
- A4: Undertake independent research with minimum guidance and synthesize that information in a well-constructed argument leading to a conclusion.

- B4: Write a well-structured essay that shows evidence of independent research, makes an argument clearly and effectively, presents original ideas and conclusions, and uses standard style for referencing.
- C1: Evaluate critically current research, advanced scholarship or professional practice in the discipline or field of study.
- C2: Evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses.
- C3: Plan, develop and apply research methods, retrieving and interpreting information from a wide range of sources.
- C6: Continue to advance their knowledge and understanding, and to develop new skills to a high level.

Submission

- Individual Essay (2,500 words)

Assessment Methods

Students will select projects and specific cartographies to investigate and discuss (an overview and list of suggestions will be provided at the beginning of the term). The submission consists of an individual visual and a written essay of 2,500 words, analysing the critical content of an urban project or any other case study, body of research, or cartographic material and linking the analysis of the project to current debates within geographical and cartographic practices linked to urbanisation processes, to be submitted at the beginning of term 3.

Assessment Criteria

In acknowledging the range of student experience and interests, the assessment criteria will reflect this diversity and respond to the scholarly objectives of individual students based on the following criteria.

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Research and knowledge acquirement
Research into the chosen area for the submission of the written and visual essay is independently undertaken, demonstrating a comprehensive understanding and critical awareness of the relevant social, political, historical, theoretical, economic, environmental and/or ethical contexts, concepts, ideas and/or precedents at the forefront of landscape, geographical and cartographic practices, being addressed through systematic enquiry.

Approach and development
The written and visual essay submitted demonstrate an inventive and original approach to the consolidation and development of research, with a consistent process of synthesising acquired knowledge is evidenced in the work. The structures, methods and/or tools utilised in the production of the work demonstrate initiative, self-directed learning, the ability to work in a group where necessary, and the skills to make complex decisions. It also uses a range and selection of relevant sources of information.

Argument and communication
The visual essay demonstrates the ability to devise and sustain complex arguments, contextualised effectively in a wider field of relevant ideas with a critical position determined. Conclusions and/or reflections are well executed, with good judgement shown in the absence of complete data. Written and visual communication skills are evidenced to a high standard throughout, and the work demonstrates the abilities developed to undertake further research.

TITLE	**CORE MODULE 4 – WORLD-ECOLOGY AND POLICY DESIGN (SEMINARS)**		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Jose Alfredo Ramirez, Elena Luciano, Rob Booth, Camila Arretche	Term	2
		Credits	15
Learning Methods	Lectures Seminars	Workload	150 hours study, inclusive of teaching contact: 25 hours teaching/125 self-directed study

Synopsis

Given the climate and ecological emergency the world is facing, it is paramount importance that those involved in designing landscapes (whether architects, landscape architects, artists, planners, or engineers) support a socially just re-structuring of the world we inhabit. This effort should be intrinsically dependant on the health of the earth systems and trigger, in turn, a radical transformation of the role we can collectively play in developing design proposals, mitigation strategies, advocacy initiatives and activism.

One way to achieve this is by learning and contributing to the design of progressive policies such as the various proposals for a Green New Deal (GND), Degrowth scholarship, Reparations theories which offers a viable initiative with the capacity to unite all of the best intentions, preoccupations and proposals of the design community at large.

The series is based on the knowledge and expertise from Common-Wealth a UK think tank that offered lectures, seminar and tutorials on a variety of themes from which student work derive the overall design agenda and research.

Aims

The aim of the series of lectures and seminars is to build the capacity of the landscape urbanism programme to explore the role of the designer in delivering economic and public policy change through design.

Content

- Session 1: Introducing to World-Ecology & Policy Design
- Session 2: World Ecology and the Capitalocene
- Session 3: Why policy design and how to design policies
- Session 4: UK wide policies
- Session 5: Progressive Policy Design Think Tanks I
- Session 6: Progressive Policy Design Think Tanks II
- Session 7: The Agrarian Question
- Session 8: Essay revision session

Learning Outcomes

At the end of the course, students should be able to:

- A2: Demonstrate a critical understanding of current theories and practice within the field of urbanism, landscape and ecology A – analyse complex territorial contexts as well as design concepts by means

of a synthesis of personal and workplace reflection and data drawn from scholarship, research and personal enquiry.
- A3: Evaluate complex and even contradictory theories and present their findings in a well-argued presentation.
- A4: Undertake independent research with minimum guidance and synthesize that information in a well-constructed argument leading to a conclusion.
- A5: Develop an understanding of environmental issues.
- A6: Develop an understanding of infrastructural input into the design.
- B4: Write a well-structured essay that shows evidence of independent research, makes an argument clearly and effectively, presents original ideas and conclusions, and uses standard style for referencing.
- C1: Evaluate critically current research, advanced scholarship or professional practice in the discipline or field of study.
- C2: Evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses.
- C3: Plan, develop and apply research methods, retrieving and interpreting information from a wide range of sources.

Submission

- Individual Essay (1,500 words)

Assessment Methods

Students will select projects and specific cartographies to investigate and discuss (an overview and list of suggestions will be provided at the beginning of the term). The submission consists of an individual visual and a written essay of 2,500 words, analysing the critical content of an urban project or any other case study, body of research, or cartographic material and linking the analysis of the project to current debates within geographical and cartographic practices linked to urbanisation processes, to be submitted at the beginning of term 3.

Assessment Criteria

In acknowledging the range of student experience and interests, the assessment criteria will reflect this diversity and respond to the scholarly objectives of individual students based on the following criteria. All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Research and knowledge acquirement
Research into the chosen area of study is independently undertaken, demonstrating a comprehensive understanding and critical awareness of the relevant social, political, historical, theoretical, economic, environmental and/or ethical contexts, concepts, ideas and/or precedents at the forefront of the architectural, landscape and urban studies disciplines, being addressed through systematic enquiry. The work should expand and dialogue with the seminar authors through cases, policy frameworks, interventions, claims, or other contemporary event that relates to the World-Ecology & Policy Design and the thesis topics.

Approach and development
The work submitted demonstrates an inventive and original approach to the consolidation and development of research, with a consistent process of synthesising acquired knowledge is evidenced in the work. The structures, methods and/or tools utilised in the production of the work demonstrate initiative, self-directed learning, the ability to work in a group where necessary, and the skills to make complex decisions. It also uses a range and selection of relevant sources of information.

Argument and communication
The work demonstrates the ability to devise and sustain complex arguments, contextualised effectively in a wider field of relevant ideas with a critical position determined. Conclusions and/or reflections are well executed, with good judgement shown in the absence of complete data. Written and visual communication skills are evidenced to a high standard throughout, and the work demonstrates the abilities developed to undertake further research. Text and media are entwined through a cohesive narrative developed through a visual essay.

TITLE	CORE STUDIO/THESIS – DESIGN THESIS		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Jose Alfredo Ramírez, Eduardo Rico, Clara Oloriz	Terms	3 and 4
		Credits	95
Learning Methods	Tutorials Juries Self-directed learning	Workload	950 hours study, inclusive of teaching contact: 150 hours teaching/800 self-directed study

Synopsis

The final dissertation is developed during the last 2 terms of the programme. This section of the course will consist of the exploration of modes of documentation that extend beyond the idea of the fixity and stability of master planning, to operate protectively and subversively. Following the development of a research based of cartographic production (atlas, cartographies, interactive tools, digital simulations), the student will produce a design manual for territorial organization follow by a details design development of a given scenario of the manual. The manual will describe the procedures and guidelines behind the project to extrapolate principles for similar, relevant locations across similar territories. The project scenarios will develop the specific outcomes and visions in a concrete context and time framework within the UK.

Aims

The aim of the final dissertation is to develop a comprehensive design project based on Landscape Urbanism principles. These projects will focus on detailed spatial and material strategies at architectural scales and will follow overall territorial guidelines. The projects will be the materialization and synthesis of policy making, technological exploration and design techniques combined to produce contemporary projects and design approaches to current global and local issues.

Content

This course is composed of:

- 2 weekly tutorials that help students develop the project and guide the students in their final production and design stages during Term 3 and 4.
- Overall arguments sessions.
- Graphic and design sessions of final booklets and guidelines for final presentations.

Learning Outcomes

At the end of the course, students should be able to:

- C3: Plan, develop and apply research methods, retrieving and interpreting information from a wide range of sources.
- C4: Synthesise design and theoretical research and report clearly, accurately and eloquently on findings.
- C5: Represent and visualise clearly in design and writing.
- C6: Continue to advance their knowledge and understanding, and to develop new skills to a high level.
- D1: Exercise initiative and personal responsibility and accept accountability for decision-making including the use of supervision.
- D2: Be able to make decisions in complex and unpredictable situations.

- D3: Have achieved the independent learning ability required for continuing professional development.
- D4: Be able to organise decision-making processes.
- D5: Work and adapt to different team experiences, sharing, negotiating and presenting information and contribute to the formulation of a design proposal at the urban and territorial scale.
- D6: Manage others' work and adapt the course design methodology to gain insight into complex urban and territorial problems.

Submission

- Individual or Group Design Thesis

Assessment Methods

Students must submit a Final Design Thesis, individual or group, which outlines the aims and outcomes of their design project. The Final Design Thesis includes the following:

- Site description.
- Text outlining aims, objectives and methodology as well as main argument of the project (2,500 words).
- Technical section essay outlining the research on building techniques, digital simulations, tests and technical data supporting the overall project (2,500 words).
- Design experiments (workshop and design development outcomes etc.).
- Main design outcomes and policy design proposals
- Images, renders and various form of landscapes representations used.

The format of this document takes the shape of a booklet, although the amount of material (images, words) is not prescribed. Students have access to previous years' Design Reports, which are discussed with the course staff to provide clear guidance of the intended outcome.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Design Criteria:

Context and analysis
The Design Thesis demonstrates a systematic understanding and critical awareness of relevant contextual factors such as site conditions, social, political, historical, economic, environmental, and ethical issues applicable to the architectural, landscape and urban design projects directly linked to existing or proposed policies. Analysis is undertaken in relation to the needs of the intended user groups and the complexities of the location and its impact into conditions at regional, national, and global scales. Appropriate conceptual, critical and/or technological precedents, methodologies, practices and/or tools inform the parameters of the argument, satisfying specific contextual and analytical requirements.

Process and synthesis
Research into appropriate contextual, conceptual, critical and/or technological precedents, methodologies, practices and/or tools is synthesised into the design process, allowing for creative decision-making, relevant design strategies, experimentation, and originality, explored from community, decision maker and designer perspectives. Feedback is integrated into a self-directed design process that demonstrates criticality and independent learning skills, and the ability to work in a group, required for continuing professional and academic development.

Resolution and communication
Design proposals are resolved to a satisfactory standard based on its response to specific policies, existing or proposed, and their deployment at multiple scales (neighbourhood, metropolitan, regional) with appropriate methodologies deployed in the production of appropriately ambitious propositional design work. Project work is organised, structured and communicated effectively through a range of considered representational methods and visual, verbal and written skills.

Technology Criteria:

Context and analysis
The Design Thesis demonstrates a systematic understanding and critical awareness of relevant contextual factors such as, consequential landscapes, global supply chains, site conditions, social, political, historical, economic, environmental and ethical issues that influence the technical and policy strategy developed in the project and its overall impact on the ongoing ecological crises. A particularly important aspect is the response and relation to existing or propose polices to which the design is attached or responsive to, according to the brief. A range of critical precedents, methodologies, practices and/or tools at the forefront of the discipline are investigated to inform the environmental, policy and technical parameters of the brief.

Approach and synthesis
An integrated technical, policy and environmental method is demonstrated through the application of research into precedents, policy proposals, contemporary technologies, materials and processes. Environmental, policy and technical knowledge acquired and/or findings are synthesised into a self-directed and critical decision-making process, demonstrating originality in tackling problems, an informed approach toward a socio/environmental justice approach to design, group and independent learning and the skills required for continuing professional and academic development.

Resolution and communication
The Design Thesis demonstrates the ability to analyse and refine technical, environmental and policy concepts, communicating sound judgements and a critical understanding of the implications of technical, environmental and policy design decisions at a range of scales over the lifecycle of the project. Through resolution, the project addresses the policy-oriented, projective and, if applicable, functional requirements of the given project. The work is structured and organised effectively and communicated through advanced visual, verbal and written communication techniques.

Professional Practice Criteria:

Knowledge acquirement
The Design Thesis analyses and reflects upon developments and insights at the forefront of the profession of architecture, landscape architecture and urban studies. Relevant contextual information and/or precedents are critically evaluated in order to inform the parameters of an appropriately clear and complete representation of the subject matter.

Integration and synthesis
The Design Thesis demonstrates the ability to work in group or independently where necessary, integrating and synthesising contextual information and acquired knowledge through a systematic method, evidencing self-direction, originality and the ability to respond critically to the subject matter.

Clarity of communication
The work elucidates concepts, facts and opinions in an analytical manner, evidencing the ability to construct and maintain a critical position. The work is structured and organised effectively, demonstrating good use of written and visual communication skills and the independent learning ability required for continuing professional development.

SECTION 6:

MSc IN SUSTAINABLE ENVIRONMENTAL DESIGN

6.1 PROGRAMME INTRODUCTION

The MSc Sustainable Environmental Design (SED) is a 12-month (4 terms) postgraduate programme focusing on cutting edge design areas of architecture, urban design and engineering following environmental design principles and sustainability considerations. The Programme focuses on innovation by integrating advanced technologies, low carbon solutions, and inhabitant experience to stimulate creativity for solving world's pressing challenges related to climate change and stay ahead of lifestyle trends.

This year the Programme has established new collaborations with leading architectural and engineering practices, offering students practical experience in a research learning environment while allowing practices to gain fresh perspectives to address real-world complex issues. Aiming at emphasising its focus on current design trends and needs, the SED programme launches a new module "Low Carbon Studio" which explores design strategies and analytical methods to radically reduce carbon emissions in the built environment.

The SED pedagogy is research-led, evidence-based and practice-oriented, addressing real-life projects across climates, urban morphologies and building typologies. The taught programme is shared by the MArch and MSc cohorts and students are free to work in mixed groups on Term 1 and 2 projects.

The programme is delivered in two consecutive phases. Phase 1 (Terms 1 and 2) is organised around group projects that engage students in experimental fieldwork and computational studies using knowledge and tools introduced in weekly lectures and workshops. Building studies and design projects in Phase 1 are usually in London and involve collaborations with professional architectural and engineering practices. Refurbishing the City, a continuing SED research agenda, provides briefs for case studies of buildings and outdoor spaces in London and other major cities. On-site fieldwork is followed by computational modelling and simulation exploring alternative scenarios for adapting to climate change and post-pandemic work patterns. In Term 2, the results of these studies become the starting points for design research on mixed-use building programmes. Design research develops in parallel to presentations by invited designers and researchers setting out the state-of-the-art in environmental design research and practice.

In Phase 2 (Terms 3 and 4), research for both MSc and MArch thesis projects are conducted individually focusing on applications that benefit local communities and engage with global issues. MSc dissertations explore the architectural potential and applicability of their research findings across climate zones and building types within selected geographic regions. MSc projects differ from MArch projects, which in contrast culminate in a specific design application for a given site and design brief. Research for both thesis projects follow the methodology outlined by the taught programme as first applied to group projects in Terms 1 and 2. Research outcomes are assessed from the viewpoint of occupants, envisaging variations in occupancy, and measured against current practice and evolving performance standards.

Since its first cycle in 2005-06 the SED programme's MArch and MSc options have delivered some 500 completed dissertation projects set in locations across 60 countries and 150 cities, both north and south of the equator. These projects now form part of a growing SED archive that has already provided material for over 100 publications in books, journals and conference proceedings. AA SED student projects have been published in scientific and architectural journals, as well as in a number of books. The programme's graduates are in high demand from both architectural and engineering practices. Over the years many AA SED alumni have achieved senior positions in practice and academia and have themselves influenced the adoption of sustainable design in many countries and climatic regions.

6.2 AIMS

Aims of the MSc Sustainable Environmental Design are to provide objective criteria, knowledge and tools for conceiving, defining, developing and assessing environmental functions, attributes and performance of buildings and outdoor spaces in different climates and urban contexts. The taught programme and project work equip students with cognitive, experiential, analytical and generative skills for engaging in interdisciplinary design research and practice. The MSc dissertation project offers a unique opportunity for combining rigorous technical research and original design applications.

6.3 LEARNING OUTCOMES

INTENDED LEARNING OUTCOMES: MSc in Sustainable Environmental Design; FHEQ LEVEL 7	
Learning Outcomes 'LO'	Aligned to the Framework for Higher Education Qualifications (FHEQ) and QAA Subject Benchmark (Architecture), on successful completion of the MSc in Sustainable Environmental Design students will be able to:
A	**Knowledge and Understanding**
A1	Demonstrate knowledge and understanding of key concepts of sustainable environmental design.
A2	Demonstrate familiarity with energy modelling and the use of environmental simulation of buildings and outdoor spaces to inform design decisions.
A3	Identify and assess key parameters characterising building types and significant architectural precedents.
A4	Demonstrate knowledge and understanding of the environmental attributes of traditional and contemporary buildings.
A5	Formulate an informed position on wider issues and objectives of sustainability.
A6	Adopt a critical position in relation to parallel contemporary tendencies in architecture and urbanism.
B	**Subject Specific Skills and Attributes**
B1	Appraise and assess key technical and theoretical aspects of environmental sustainability in architecture and urban design.
B2	Plan, implement, process and interpret fieldwork involving observations, surveys and measurements using specialist instruments and data acquisition techniques.
B3	Apply appropriate specialised computational tools and performance assessment techniques to inform design decisions and assess the environmental impact and performance of buildings and urban spaces.
B4	Identify, compare and assess environmental attributes of buildings using on-site observations and measurements, as well as comparative performance data and calculated results.
B5	Assess the potential offered by new materials and technologies.
B6	Develop and test original design applications taking account of climate, site, and occupant comfort, health and wellbeing.
C	**Transferable Skills and Attributes**
C1	Applying appropriate analytical tools and evidence-based techniques to formulate and test research hypotheses.
C2	Collaborate in environmental research as a member of interdisciplinary international teams.
C3	Develop and test effective means of communication with clients and colleagues.
C4	Continue expanding their knowledge using the skills acquired on the course.

6.4 ASSESSMENT CRITERIA

All learning outcomes must be met in order to achieve a pass overall. The assessment of submitted work is based on the following overall assessment, The assessment of submitted work is detailed in each of the below sections of this Programme Guide. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Design:

Context and analysis
Demonstrating systematic understanding and critical awareness of relevant contextual factors. Application of methodology and analytical tools introduced by the taught programme to investigate specificities and variabilities of climate, urban morphology, vernacular and contemporary built precedents, and national and international regulations and standards, as these impinge upon the comfort and wellbeing of the intended user groups.

Process and synthesis
Undertaking research into specific contextual practices and issues demonstrating criticality, original thinking, independent learning skills and ability to work in a group. Generative and iterative application of computational tools to model and simulate site conditions, building form, construction and building occupancy, testing alternative design options, informing the design process with the results of the analysis.

Resolution and communication
Design proposals resolved to a satisfactory standard based on functional and aesthetic criteria and project targets set by the brief, assessed on comparative predictions of carbon emissions and occupant satisfaction. Evidence of well organised project work and effective collaborative procedures with research results and design proposals communicated effectively through a range of representational methods and visual, verbal and written skills.

Technology:

Context and analysis
Demonstrating a systematic understanding and critical awareness of relevant contextual factors. Engaging in data collection and processing aimed at characterising environmental conditions in and around buildings. Application of fieldwork methods and analytical tools introduced by the taught programme to investigate the environmental performance of buildings and outdoor urban spaces.

Approach and synthesis
Environmental knowledge acquired from the taught programme, published literature, field studies and analytical work synthesised into effective and original proposals demonstrating an informed approach toward regenerative design, independent learning and ability to work in a group, and the skills required for continuing professional and academic development.

Resolution and communication
The work demonstrates ability to analyse and refine technical concepts, communicating a critical understanding of the implications of design decisions at a range of scales over the lifecycle of the project. The project addresses the functional, programmatic and aesthetic requirements of the brief. The work is structured and organised effectively and communicated through advanced visual, verbal, and written communication techniques.

Professional Practice:

Knowledge acquirement
The work analyses and reflects upon developments and insights at the forefront of the profession of architecture. Relevant contextual information and/or precedents are critically evaluated in order to inform the parameters of an appropriately clear and complete representation of the subject matter.

Integration and synthesis
Demonstrates ability to work independently and in a group, integrating and synthesising contextual information and acquired knowledge through a systematic method, evidencing self-direction, originality and the ability to respond critically to the subject matter.

Clarity of communication
The work elucidates concepts, facts and opinions in an analytical manner, evidencing the ability to construct and maintain a critical position. The work is structured and organised effectively, demonstrating good use of written and visual communication skills and the independent learning ability required for continuing professional development.

6.5 CREDIT FRAMEWORK

Term	Course Title	Credits
1	Core Module 1 – Group Project 1: Building Studies	30
2	Core Module 2 – Group Project 2: Refurbishing the City Design Project	30
1	Core Module 3 – Research Paper 1	10
2	Core Module 4 – Research Paper 2 + Dissertation Outline	20
3, 4	Core Studio/Thesis – MSc Dissertation	90
1	Adaptive Architecturing	0 (Supporting programme content)
1	Design for Comfort, Health and Wellbeing	0 (Supporting programme content)
1, 2	Environmental Design Research Tools	0 (Supporting programme content)
1, 2	Low Carbon Studio	0 (Supporting programme content)
1, 2, 3	Research Seminar	0 (Supporting programme content)
2	Sustainable City	0 (Supporting programme content)
2, 3	Lessons from Practice (open to auditing students)	0 (Supporting programme content)

6.6 TEACHING AND LEARNING METHODS

Weekly lectures, research seminars, software workshops, individual and group tutorials and daily study in the programme's studio provide the theoretical and empirical knowledge, methodology, analytical tools and guidance needed for undertaking real-life projects involving fieldwork as well as advanced computational studies and design research. SED projects are cross-course learning vehicles focused on the design, making, operation, performative assessment and potential improvement of new and existing built environments and microclimates, indoors and outdoors. In Term 1 the approach followed week by week is that of learning by doing. Three complementary lecture series are set in motion at the beginning of the term to provide the knowledge and tools needed each week for undertaking Team Project 1. In Terms 1 and 2, project work is in groups of 3-4 students that combine MSc and MArch students. Dissertation research is undertaken individually allowing students to contextualise their projects for the local climate and other specificities of their chosen geographic region and urban contexts.

Lecture Courses
In Term 1 the weekly taught programme provides the shared knowledge, skills and tools needed for project work and professional practice. Lectures address current issues and professional concerns thus providing a critical overview of the research directions pursued by the programme relative to the profession as a whole. Term 1 lectures are delivered by the programme's regular staff to ensure continuity and complementarity

providing direct support to student project work. In Terms 2 and 3 invited researchers and designers provide diversity of opinion, variety of input, and links with research and practice outside the programme. Lecture topics feed directly into each term's project agendas. Lectures are stored in electronic format and are available to students for further study.

Seminars and Workshops
The Research Seminar is a regular forum on research methods, information sources, essay writing and project documentation. It runs throughout the year. The Tools Workshop provides training in the use of a wide range of software tools. It is particularly intensive during Term 1 aiming to develop the empirical and analytical skills required for undertaking project work.

Projects
Term 1 and 2 projects are undertaken in teams of 3-4 students supported by weekly group tutorials and regular progress reviews. Projects are the vehicles for applying and integrating all the inputs of the taught programme. Each team project accounts for 30 credit units (some 300 study hours including attendance of related courses) awarded to each student. Technical studies undertaken as part of project work may involve fieldwork and/or analytical work that is shared between team members. Project support is in the form of weekly team tutorials and regular presentation of research results. Successful completion accounts for 10 credit units.

Research Papers
Research papers are expected to apply the knowledge and understanding gained from attending the taught programme to undertake critical review of published literature in selected topics of interest. They are undertaken individually supported by regular tutorials. Each research paper of 3,000 words accounts for 10 credit units. Research Paper 2, submitted at the beginning of Term 3, extends into preliminary studies to define the context, main topics and research questions of the dissertation for which it is assigned a further 10 credits.

Dissertation
The dissertation project is a significant piece of research that reflects the SED programme's areas of specialisation and students' backgrounds, personal interests, special skills and plans for the future. The Dissertation accounts for 90 credit units. Preliminary work in the form of a definition study is undertaken during Term 2 and an outline is included as an appendix to Research Paper 2. Dissertation topics are confirmed by the submission of written outlines aimed at providing evidence that the proposed topic is within the student's grasp and capabilities. Students researching related topics may choose to work together in pairs at early stages of the research. The MSc dissertation is concerned with the architectural potential and applicability of environmental design research across climate zones and building types. Supervision of dissertation work is by weekly individual tutorials with assigned tutors; mid-term and end-term reviews with the programme's teaching staff and external reviewers. A list of completed MArch and MSc Dissertation Projects is included in the SED Programme Handbook. Printed and electronic copies are kept in the programme's archives.

Study Trips and Special Events
These include scheduled visits to buildings of interest, meetings with designers and researchers, participation in international conferences and joint workshops with students and staff from other institutions. Visit schedules vary from year to year; details are confirmed early in the year. Study trips take place during Term 2 or 3. Participation in trips involving travel abroad is optional; alternative arrangements are provided for students who are unable to travel abroad.

6.7 COURSES

TITLE	**CORE MODULE 1 – GROUP PROJECT 1: BUILDING STUDIES**		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Paula Cadima, Nick Baker, Gustavo Brunelli, Herman Calleja, Olivier Dambron, Mariam Kapsali, Byron Mardas, Mileni Pamfili, Pierluigi Turco, Divy Vora	Term	1
		Credits	30
Learning Methods	Empirical and analytical studies of the environmental attributes and performance of occupied buildings undertaken and submitted as group work; application of theoretical principles, fieldwork and specialist software introduced by the taught programme; collection and processing of building and outdoor data, group tutorials, project progress reviews, report writing and project documentation	Workload	300 hours study, inclusive of teaching contact: 148 hours teaching/152 hours self-directed study

Synopsis

Study of environmental performance and whole-life carbon analysis of selected buildings and outdoor urban spaces of architectural and environmental interest. The project is undertaken in teams of 3-4 students and makes use of all the inputs, tools and resources provided by the taught programme week by week in Term 1. The Project Brief is introduced at the beginning of Term 1 and work starts on the same day. The project combines fieldwork and computational studies providing unique insights on how buildings work in practice, the predictive potential of computer modelling and environmental simulation and the relationship between simulation and reality. Students get to learn first-hand from the experience of building occupants, managers and designers as well as from each other.

Aims

This project is a vehicle for developing specialist observational, experimental and analytical skills by studying environmental interactions in the built environment and the resulting effects on the comfort, health and wellbeing of inhabitants. The project is designed as a learning-by-doing exercise with student teams applying the inputs of the taught programme as delivered week by week. The project also offers experience of group work that is essential for practice in this field. The project tasks are typical of work the programme's graduates can expect to undertake in practice. In the last fifteen years over one hundred buildings have been studied for this project and some of these building studies have been published.

Content

- Review of published literature on buildings selected as case studies.
- On-site observations and environmental measurements (spot measurements and hourly datalogger readings over 7-10 consecutive days).
- Interviews with designers, occupants and building management staff.
- Processing and interpretation of fieldwork.
- Planning of computational studies based on fieldwork findings and course inputs on building modelling, material specifications and operational conditions.
- Computational simulations of environmental conditions in selected spaces indoors and outdoors investigating occupant comfort and energy use.

- Exploration of possible improvements to occupant comfort and wellbeing under varying occupancy and climate change scenarios.

Learning Outcomes

On completion of this project students can be expected to be able to:

- Undertake field studies involving building surveys, occupant interviews and environmental measurements.
- Carry out critical appraisals of the environmental attributes of buildings and outdoor spaces using on-site observations as well as analytical studies based on simulation.
- Formulate proposals for environmental improvements to existing buildings and outdoor spaces accounting for specificities of site, local climate, urban morphology, building type, construction and occupancy.

Submission

- Project Report

Assessment Methods

Weekly formative assessments in regular group tutorials; mid-term and end-term project presentations reviews. Summative assessments and grading of submitted project reports by two internal assessors.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context and analysis

- Demonstration of knowledge and understanding of relevant theoretical principles, empirical data, research methods and computational tools introduced by the taught programme.
- Planning and execution of field studies and analytical work to investigate specificities and variabilities of climate, urban morphology, vernacular and contemporary precedents and national and international regulations and standards.

Process and synthesis

- Demonstration of innovative thinking and creativity.
- Clarity and transparency in structure, writing and visual presentation of project results.

Resolution and communication

- Referencing of sources of information using agreed conventions.

TITLE	**CORE MODULE 2 – GROUP PROJECT 2: REFURBISHING THE CITY DESIGN PROJECT**		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Paula Cadima, Gustavo Brunelli, Herman Calleja, Olivier Dambron, Mariam Kapsali, Byron Mardas, Mileni Pamfili, Pierluigi Turco, Divy Vora	Term	2
		Credits	30
Learning Methods	Lectures, site studies, predesign and design development studies using simulation tools; developing design briefs; design research and proposals working as member of project team; group tutorials, progress presentations, project documentation and report writing	Workload	300 hours study, inclusive of teaching contact: 137 hours teaching/ 163 hours self-directed study

Synopsis

The findings of the building case studies undertaken in Term 1 provide starting points for design research on a London site. This design project provides a vehicle for exploring visions of sustainable living environments following the methodology and tools introduced by the taught programme. The Project Brief is introduced at the beginning of Term 2. Work on this project accounts for 30 credit units for each student. It is undertaken in teams of 3-4 students with each team developing its own design brief and research agenda.

Aims

To apply the knowledge and tools provided by the taught programme to the development of design proposals for a specific building programme, climate and site.

Content

- Predesign research leading to formulation of team design briefs and research agendas.
- Climate and site microclimate studies.
- Review of relevant vernacular and contemporary precedents.
- Environmental simulation studies to investigate performative potential.
- Design development and final proposals.
- Comparative assessment of design proposals against industry standards and benchmarks.

Learning Outcomes

On completion of this project students can be expected to be able to:

- Develop designs for new environments and reuse of existing buildings based on specificities of climate, site, building type and occupancy, exploring potential for zero carbon applications.
- Draw lessons and research questions from historical and contemporary building precedents.
- Use appropriate performance assessment and design research tools as and where needed to inform design decisions and assess the environmental impact of proposed designs.

Submission

- Project Report

Assessment Methods

Weekly formative assessments in regular group tutorials; mid-term and end-term project presentations reviews. Summative assessments and grading of submitted project reports by two internal assessors.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context and analysis

- Evidence of learning from contextual studies and built precedents.
- Transparent methodology to formulate and investigate design ideas and research hypotheses.

Process and synthesis

- Demonstration of innovative thinking and creativity in design research.
- Effective application of knowledge and analytical tools introduced by the taught programme.
- Capacity for comparative analysis and interpretation of analytical studies.

Resolution and communication

- Adherence to project briefs.
- Clear structure, writing and presentation of project reports.
- individual student experiences and contributions to the team effort.

TITLE	CORE MODULES 3 AND 4 – RESEARCH PAPERS 1 AND 2 + DISSERTATION OUTLINE		
Level Teaching Staff Learning Methods	FHEQ Level 7 Nick Baker, Paula Cadima, Olivier Dambron, Mariam Kapsali, Mileni Pamfili Seminar attendance, oral presentation of work in progress, literature research, essay writing, individual tutorials	Status Terms Credits Workload	Compulsory 1 and 2 30 • 10 Term 1 • 20 Term 2 300 hours study, inclusive of teaching contact: 52 hours teaching/248 hours self-directed study

Synopsis

Research Papers are critical reviews of published literature, written individually on selected topics. They account for 10 credits based on submission of written essays of 3,000 words. Term 2 Research Paper 2 is expected to extend into a definition study for the dissertation. The definition study is assigned an additional 20 credits. Over the year the Research Seminar is a regular forum supporting the development of writing skills and engagement with the relevant literature.

Aims

Critical review of bibliographical material on selected topics. Practice of technical academic writing and referencing. Support for dissertation development.

Content

- Literature research for relevant information and data on topics of interest.
- Critical group discussions of selected topics.
- Individual tutorials on potential topics and research methods for Research Papers and Dissertation.
- Introduction to technical writing and referencing.

Learning Outcomes

On completion of these assignments students can be expected to:

- Have acquired familiarity with the programme’s essential published literature and key topics.
- Have sharpened their knowledge and understanding of sustainable design in architecture and urbanism.
- Have improved their oral and written reporting of research.

Submission

- Research Paper 1 (3,000 words)
- Research Paper 2 + Dissertation Outline

Assessment Methods

Formative assessment in regular individual tutorials. Summative assessments and grading of submitted papers by two internal assessors.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context and analysis

- Understanding of critical environmental issues facing the profession.
- Formulation of research questions based on readings of relevant literature and findings of team projects.

Process and synthesis

- Ability to work independently demonstrating good judgment in selection and treatment of research material.

Resolution and communication

- Clear and concise writing and presentation of research results.

TITLE	CORE STUDIO/THESIS – MSc DISSERTATION		
Level	FHEQ Level 7	Status	Compulsory
Teaching Staff	Paula Cadima, Olivier Dambron, Mariam Kapsali, Mileni Pamfili, Pierluigi Turco	Terms	3 and 4
		Credits	90
Learning Methods	Seminar attendance, oral presentation of work in progress, literature research, essay writing, individual tutorials	Workload	900 hours study, inclusive of teaching contact: 57 hours teaching/843 hours self-directed study

Synopsis

The Dissertation Project is meant as a significant piece of research that reflects the SED programme's areas of interest and students' backgrounds, personal interests, special skills and plans for the future. It integrates all the inputs of the taught programme providing the opportunity for in-depth exploration of climatic conditions, urban morphologies, contemporary and vernacular building precedents, and specific issues relating to the chosen topic. Work on the Dissertation is undertaken individually and accounts for 90 credits. Its context and specific topics evolve in parallel to Research Paper 2 with support from the Research Seminar and weekly individual tutorials throughout Terms 3 and 4.

Aims

The MSc dissertation offers students the opportunity to complete the course by undertaking a rigorous research project that explores realistic applications and potential environmental improvements across climatic regions and/or building types.

Content

- Context and building type.
- Contextual studies including climate analysis, traditional and contemporary built precedents.
- Field studies (if any).
- Analytical work aimed at mapping potential applicability and performative attributes of different design strategies.
- Urban and building design guidelines for chosen climatic region and building type aimed at informing design decisions.
- State-of-the-art review of selected research topics relating to selected climatic region, urban.

Learning Outcomes

On completion of the dissertation project students can be expected to be able to:

- Assess the environmental attributes of buildings and outdoor spaces as relating to occupant comfort, health and wellbeing.
- Use specialist computational simulation tools to inform design decisions and/or assess environmental impact and performance of buildings and urban areas.
- Develop architectural design proposals and design applicability studies for new and existing buildings taking account of specificities of climate, site, building type and occupancy.
- Assess the potential offered by new materials and renewable energy technologies;
- Plan, document, illustrate and interpret research results encompassing fieldwork, analytical studies and design proposals.

Submission

- Dissertation (15,000 words)

Assessment Methods

Formative assessments based on individual tutorials throughout Terms 3 and 4 and mid-term and end-term public presentations and reviews. Summative assessments of completed Dissertations by two internal assessors combined into agreed grading.

Assessment Criteria

All learning outcomes must be met in order to achieve a pass overall. Students are required to demonstrate knowledge, understanding, ability and skills in the following areas:

Context and analysis
- Knowledge and understanding of the theoretical principles, research methods and analytical tools introduced by the taught programme.

Process and synthesis
- Application of critical faculties and observational skills.
- Ability to use fieldwork and analytical studies to test research hypotheses and find new data.
- Application of new knowledge and tools in design research and practice.
- Demonstration of innovative thinking and creativity.

Resolution and communication
- Responsible application of technical knowledge and analytical tools.
- Clear, concise writing and strong visual presentation of project aims and outcomes.
- Referencing of sources of information using agreed conventions.