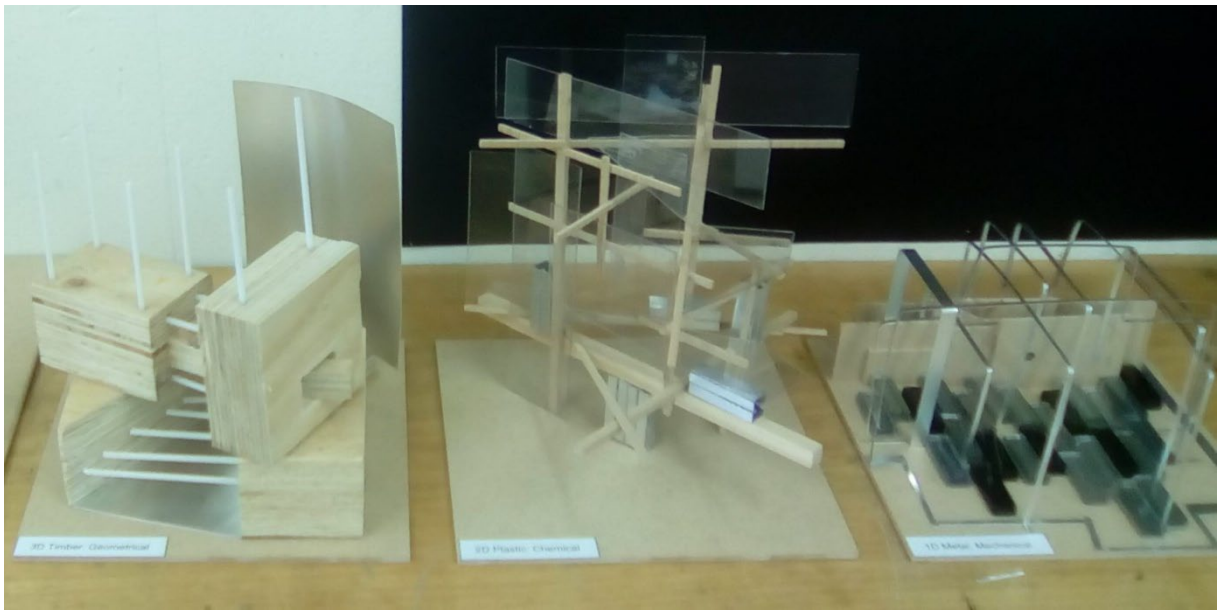
ARCH5112 Design Studio 1 2023

SEMESTER 2

Project 3 MATERIALITY

Weeks 4 - 6 **MATERIALITY** **22%**



Student Exemplar (1): 3 x Materiality Models, using 3 chosen materials, exploring 3D,2D,1D components

Each material has its own formal language, and no material can take the form of another material for which it is not suited … No material permits an infringement in its formation.

Loos, quoted in Eva B. Ottillinger, Adolf Loos: Wohnkonzepte und Möbelentwürfe*, Residenz, Salzburg and Vienna, 1994, p. 13.*

materiality **Matū**
the nature of the material utilised in a construction, where designated components have intrinsic physical qualities, capacities and significance

tectonics **Hanga Haratau – *hanga - to make, build, fashion, create; haratau - to be convenient, suitable, approved, relevant***
refer to the activity of making the required construction in response to functional needs, and how the materials are assembled "artfully"

AIMS

- To initiate an understanding of the nature and joining of materials

- To explore how a material's geometrical qualities both constrain, and inspire, its use

- To explore how a material can have a number of visual and textural qualities

- To initiate understanding of how materials generate the 'fabric' of a building

Materials have three states: gas, liquid, solid.
All materials change state when subjected to a change in temperature.
H2O becomes vapour, water, ice.

"You say to a brick, "What do you want, Brick?" and Brick says to you, "I like an arch." And you say to Brick, "Look, I want one too, but arches are expensive and I can use a concrete lintel over you, over an opening." And then you say, "What do you think of that, Brick?". Brick says, "I like an arch."

Louis Kahn
https://www.youtube.com/watch?v=ZbE3rmh62x4 https://alchetron.com/Louis-Kahn

Materials have distinct qualities and capacities which are described by their **materiality**.
They have a specific density and texture depending on their form.
They have a temperature. They may be rough or smooth, soft or hard, shiny or matt, transparent or opaque.

Bridge building in the **STRUCTURE** (Project 2) programme introduced the physical capacities of materials: how they could be organised and connected to resist loads successfully; and how this might achieve an aesthetic goal.

The **MATERIALITY** brief is an exercise which extends the understanding of various ways: how materials can be joined together; and how these connections, and the composition of materials, can embody a concept.

Tectonics are how materials are employed and joined together to define the poetics of construction.

Architectural compositions are generated by arranging 3D (mass), 2D (planar) and 1D (linear) elements.

By the construction of a relationship between 3D, 2D and 1D elements SPACE is generated.

The space between objects is the real "material" of architecture.

TASKS

1/ Make 3 models

Select 3 materials
e.g. glass or acrylic, wood, metal, stone, fibre, ceramic, concrete or plaster

Find a 3D mass, 2D planar and 1D linear example of each of the materials selected.
e.g. for metal – 3D solid metal, 2D sheet of metal, 1D metal wire
for wood – 3D solid wooden block, 2D sheet of wood, 1D wooden sticks

Play and manipulate the 3 different materials in their 3 different forms, exploring a concept of composition.

Every model has every material, each of the formal 1D, 2D, 3D forms represented and a principle joining system assigned. (See over for a detailed explanation of jointing systems.)

There should be an emphasis chosen on the dominant material and form in each model.

The models at this stage of composition have no particular scale.
They could represent a room or a city.

MATERIALITY MODEL ASSIGNMENT

Each model will have a dominant material, a dominant 1D/2D/3D emphasis and a dominant jointing system.

Following the matrix below could assist you in working out your model formats:

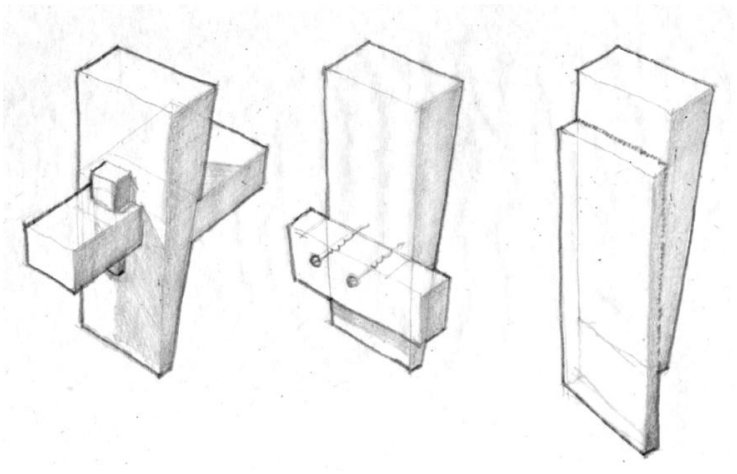
	MODEL 1	MODEL 2	MODEL 3
Material 1 1D, 2D or 3D			
Material 2 1D, 2D or 3D			
Material 3 1D, 2D or 3D			
Principle Joining System - geometrical - chemical - mechanical			

Table (1): matrix for material and joining system assignment

e.g. Model 1 - 3D wood block, 2D sheet metal, 1D string fibre
Model 2 – 3D metal mass, 2D fibre (fabric), 1D wooden sticks
Model 3 – 3D fibre mass, 2D sheet wood, 1D metal wire

Assign to each model a principle joining system to hold the elements together.

The 3 principle methods to make connections between materials are geometrical, mechanical and chemical.



GEOMETRICAL MECHANICAL CHEMICAL

Figure (1): sketch illustrating connection/jointing typologies

Geometrical:
In Geometrical Joints connections between materials are made using interlocking pieces e.g. as in Japanese wooden joinery.

Mechanical:
In Mechanical Joints connections between materials are made using another material or fixture to hold elements together e.g. screws, nails, rivets, pins, binding with cord or fibre etc.

Chemical:
In Chemical Joints connections between materials are made using glue or other adhesives. The greater the surface area of contact the more stable the connection e.g. PVA, resin, Epoxy resin, acrylic cement

When making your models conceive a clear emphasis in each model.

In architectural composition there is usually a balance between the various components which is important when creating a harmonic construction.

Conceive of a prevalent material and a prevalent 1D, 2D or 3D dimension in the structure of the space generated in each model.

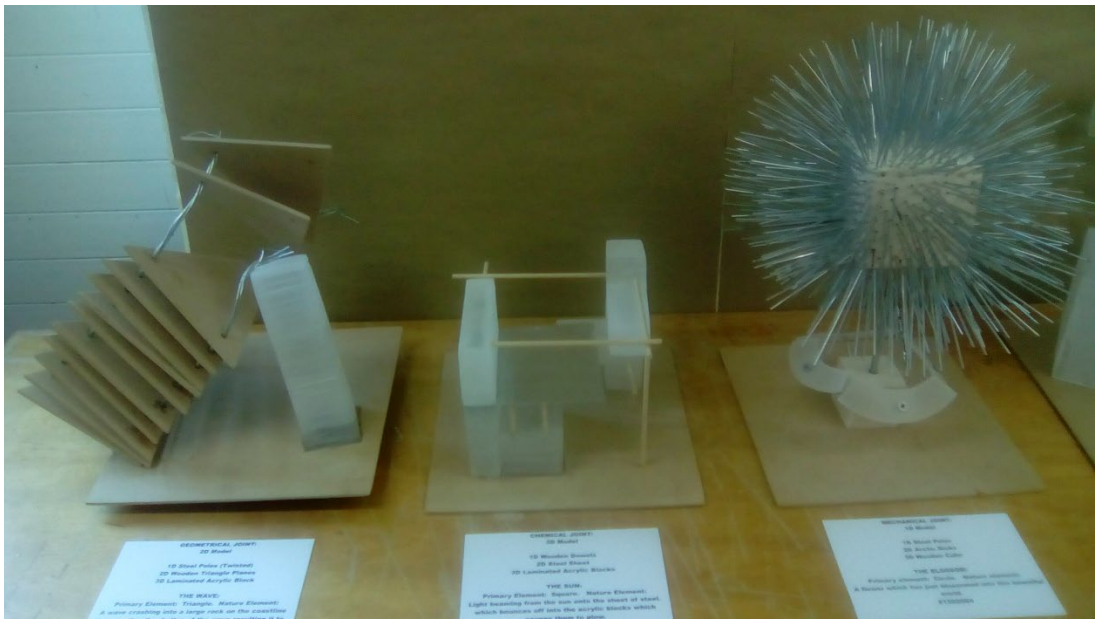
Each model should have a dominant material, dimension and connecting strategy.

This should be clearly labelled on each model.

Example: YOU ARE USING 3 DIFFERENT MATERIALS

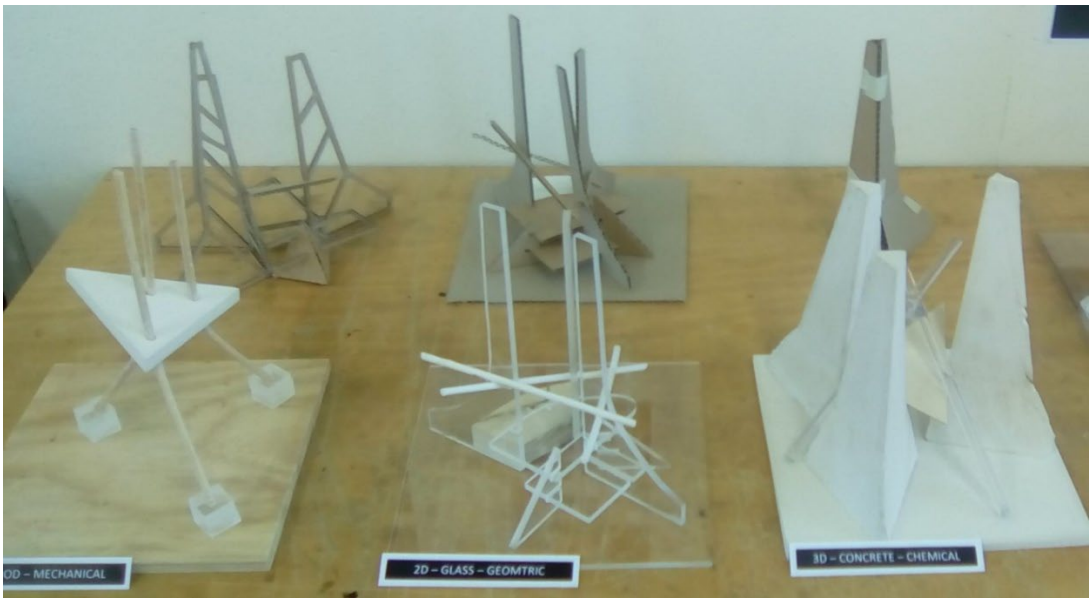
	MODEL 1	MODEL 2	MODEL 3
WOOD	1D stick	2D sheet	3D block
METAL	2D sheet	3D cube	1D wire
COTTON/FIBRE	3D ball	1D stings	2D fabric
Principle Joining System	Geometrical - interlocking	Chemical - glued	Mechanical - screwed

Table (2): example of material and joining system assignment



Student Exemplar (2): 3 x Materiality Models, using 3 chosen materials, exploring 3D,2D,1D components

Student Exemplar (3): 3 x Materiality Models, using 3 chosen materials, exploring 3D,2D,1D components



Student Exemplar (4): 3 x Materiality Models, using 3 chosen materials, exploring 3D,2D,1D components

2/ Photograph the models

The 3 models have no particular scale at this stage.

Take 3 photographs of each model.

One may be a more bird's eye view image to communicate the overall composition.
Another may be a view from a different direction
Also include a more detailed, closer up image describing an interior space or material connection described by the model.

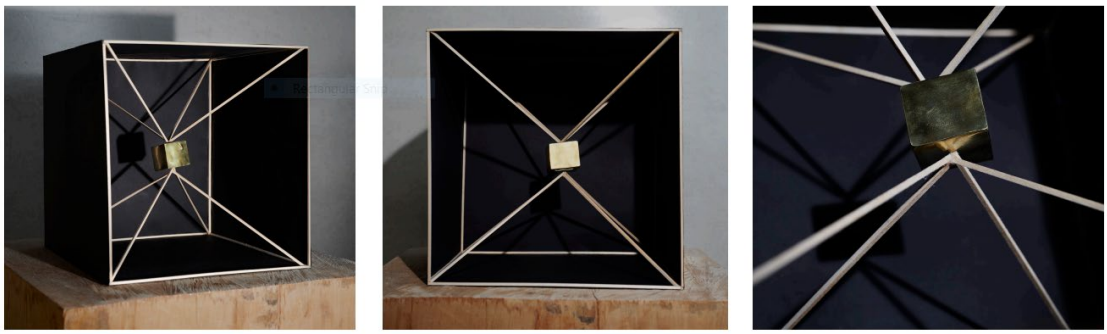
Take many photos so you can select the best, most successful narrative for each model.

Model One / Mechanical
Principal element: 3D wood
Secondary elements: 2D brass, 1D paper

Movement Dimension: length and breadth

Model Two/Geometric
Principal element: 1D brass
Secondary elements: 2D wood, 3D paper

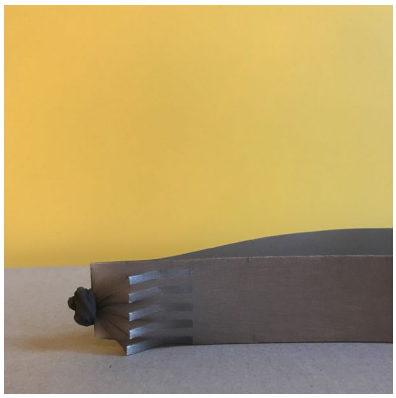
Movement Dimension: spin



Model Three/Chemical
Principal element: 2D paper
Secondary elements: 1D wood, 3D brass

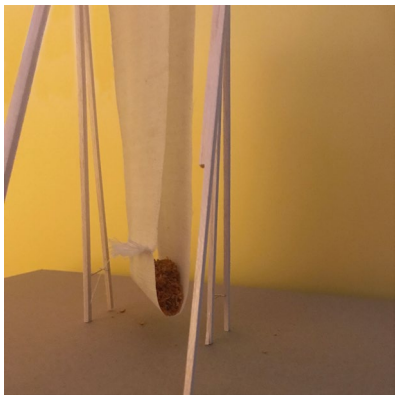
Movement Dimension: height

Student Exemplar (5): 3 x images of each of 3 x Materiality Models – providing narrative and detail

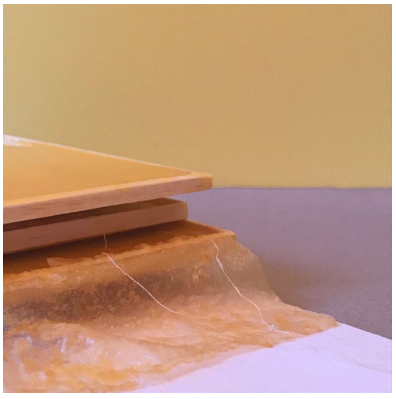
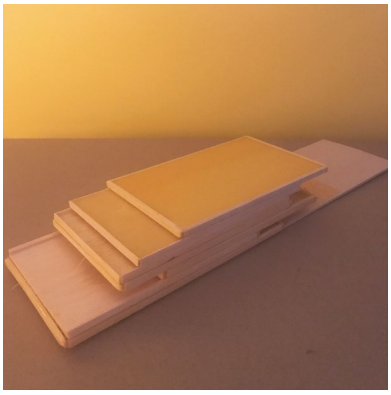
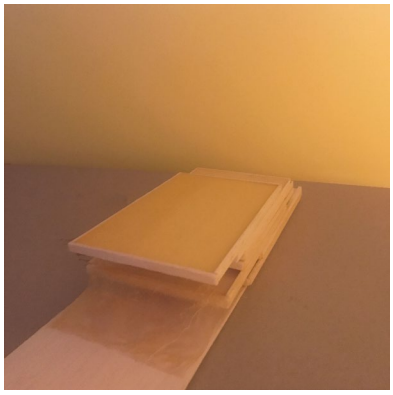


Model One (Detail) / Geometric
Recycled fabric stretched over timber frame, orange peel
Principal element: 3D fabric box
Secondary elements: 2D timber frame, 1D orange peel, stripped and dried





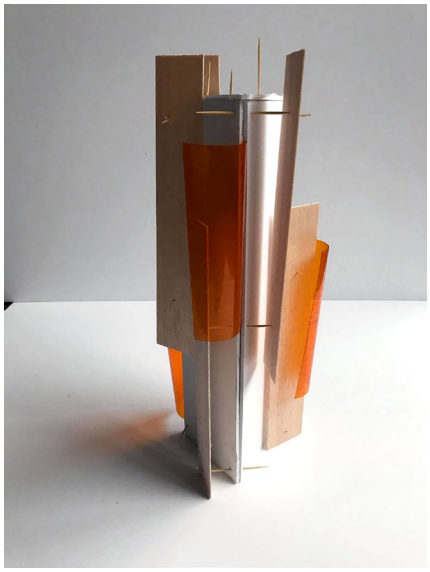
Model Two (Detail) / Mechanical
Recycled fabric, balsa wood, grated orange peel, pins
Principal element: 1D timber
Secondary elements: 2D recycled fabric, 3D orange peel, grated and dried

Model Three (Detail) / Chemical
Orange juice, balsa wood, recycled fabric, glue
Principal element: 2D liquid (orange juice)
Secondary elements: 1D fabric threads, 3D balsa wood trays

Student Exemplar (6): 3 x images of each of 3 x Materiality Models – providing narrative and detail

3D Timber –Dominant 2D Plastic 1D Foam board Chemical



3D Foam board –Dominant 2D Timber 1D Plastic Mechanical

3D Plastic –Dominant 2D Foam board 1D Timber Geometric

Student Exemplar (7): 3 x images of each of 3 x Materiality Models – providing narrative and detail

3/ Draw a detail at 1:1

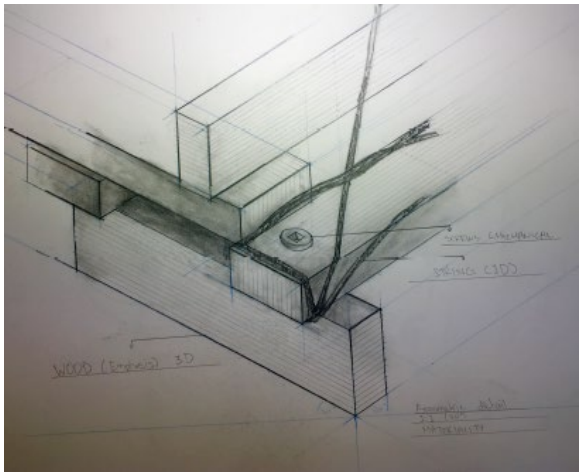
Look carefully at your models.

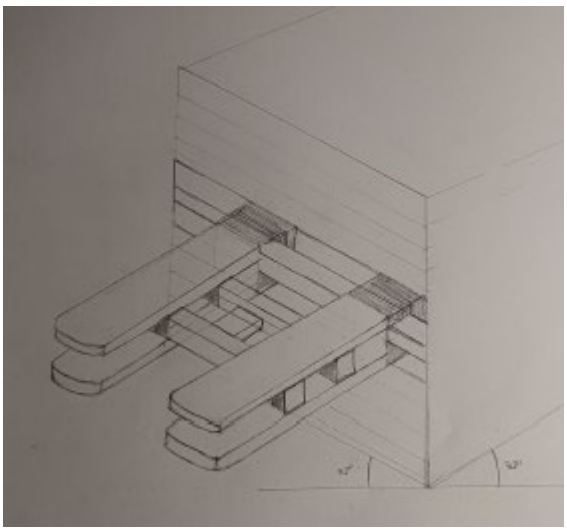
Select a detail in one of your models, where the 3 materials intersect, coming together to be connected.

The detail should reveal the nature of this connection: chemical, geometrical or mechanical.

Draw an isometric/axonometric of the selected detail, on an A4 sheet.

Describe the texture and material of the construction and how they are joined together.





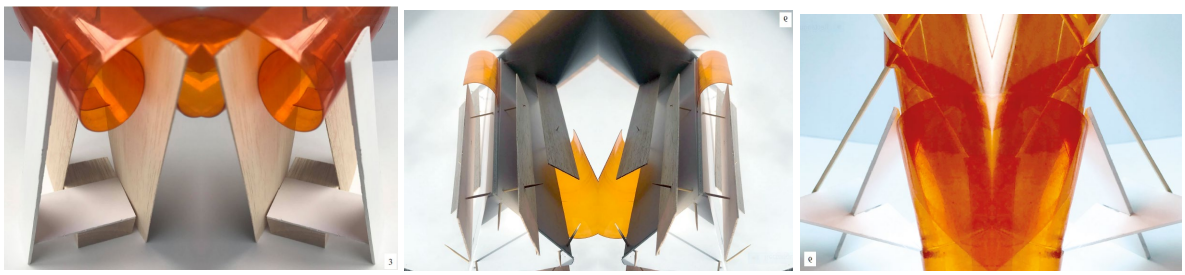
Student Exemplars (8): Detail axonometric drawing describing significant material connection

4/ Write a conceptual description

Using specific vocabulary, write a carefully crafted description of the conceptual significance of the ideas explored in the triceps of models.
What is the common theme which is developed through the exploration of form, connection and materiality across the three models?

Maximum 100 words.

Examples:

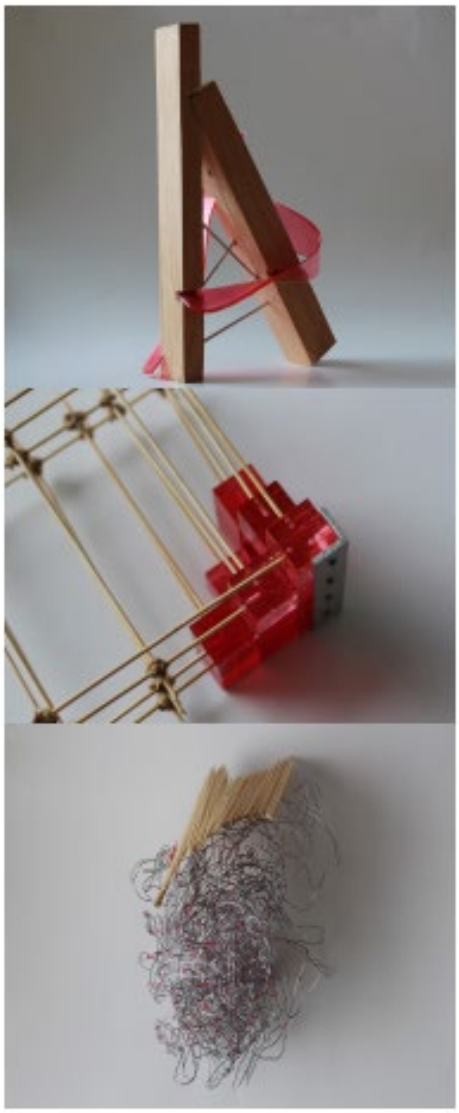


Building houses on Mars may sound like science fiction – but the idea that we could build and live on another planet, is actually not as far-fetched as you might think.
As technology continues to rapidly evolve and space travel becomes increasingly viable, many respected organisations around the globe are now racing to develop credible, workable proposals for habitation on Mars, and more importantly for how such extra-terrestrial buildings would be constructed. What was once a far-off fantasy is steadily becoming reality. Here we look at three models in context " if I was the only architect on mars".w

Student Exemplar (9): Conceptual description of Materiality exploration

"This project seeks out the physical, temporal and metaphoric connections that come about through a testing of three materials: recycled fabric, balsa wood and orange. The constraints of each material, discovered during the construction of three models, are left seen in the final compositions: a compressed timber frame, a seeping liquid, a loose, perfumed mass. These constraints document time and gesture, while building a sensory space that follows the form of the physical model, the surrounding space, intimate scale and time".

Student Exemplar (10): Conceptual description of Materiality exploration



This project is an exploration into neuroplasticity, and seeks to express this concept through the composition of three models. Each model represents an element of what neuroplasticity is; our brains ability to reorganize its structure and functions by forming new connections, in response to experiences. As observed in each of the three models, three fundamental principles are rectified in each of the models; structure, interconnection and plasticity.

The physical representation of these principles were achieved through the manipulation and composition of the materials utilised; timber, resin and metal. A solid cuboidal structure, a vertical timber structure, and a complex metal network that embody circuits that exist within the brain.

Student Exemplar (11): Conceptual description of Materiality exploration

ASSESSMENT EVENT – MATERIALITY
Thursday 31st August 2:00 – 5:00pm

The pin-up of your presentation MUST be completed by 2pm.

This is the submission deadline.

Following pin up every student will verbally present their work in person to the group.

If for any reason you are unable to pin-up and present your work on this occasion you can make an application for an Affected Performance Consideration (APC).

NOTE: Digital Hand-In 4pm on Friday 1st September
The Digital Submission MUST include a photograph of the work pinned up in studio and a carefully composed document of each of the deliverables, drawings, photos and models.

MATERIALITY DELIVERABLES **11% of semester grade**

1 x brief description of the underlying concept of your models (100 words max), together with the completed model matrix	**10%**
3 x 250mm x 250mm x 250mm (approximately) models Each model is be identified with a label of the principal material, connection method and 3D/2D/1D element	**40%**
9 x photographs – 3 images of each model	**30%**
1 x isometric/axonometric detail drawing	**20%**

GRADING CRITERIA
(Associated Learning Outcomes 1,2,3,5 – see Studio Introduction on Moodle page)

1. Well-crafted models

2. Presentation of models with labels clearly indicating 1D, 2D or 3D material and joining emphasis

3. Beguiling compositions and thematic conceptual exploration

4. Show understanding of material's ability and constraints to join with other materials

5. Clear, well-composed photographs that allow the viewer to focus on construction and materiality of the model

6. Carefully drawn isometric/axonometric detail of one model's primary connections

DATES OF STUDIO

Thursday 17th August **1:00pm - 5:00pm**
1:30pm – Bridge Report Booklet – hardcopy hand-in + digital submission to Moodle by 2pm
1:30pm – Bridge Report Booklet – hardcopy hand-in

2pm - Introduction **MATERIALITY Brief**

Week 5

Monday 21st August **8:00am - 12:00 pm**
Whole cohort Studio **- Bring Matrix**
Content – 3D/2D/1D model examples – exemplars in architectural composition
- conceptual descriptions – student exemplars

Class groups with tutors – workshop and discussion of tasks

Wednesday 23rd August **8:00am - 10:00am**
Rimo, Scarlett and Joseph – self-directed studio session – workshops and Q&A

Thursday 24th August **1:00pm - 5:00pm**
Whole cohort Studio **- Bring concept statement + model progress**
Content – connection details – real architectural examples
Class groups with tutors – task workshop – presenting model concepts, making, discussion

Week 6

Monday 28th August **8:00 - 12:00 pm**
Whole cohort Studio
Content – drawing details – architectural exemplars
Class groups with tutors – workshop and discussion of tasks

Wednesday 30th August **8:00am - 10:00am**
Rimo, Scarlett and Joseph – self-directed studio session – workshops and Q&A

Thursday 31st August **1:00pm - 5:00pm**
Assessment Event: Materiality - individual tutor groups
In-person presentations – 5 mins speaking 5 mins feedback
Presentation of Models and deliverables from 2pm
- **All students must attend and present their work in person**

Final PDF Submission by 4pm on Friday 1st September

2-week mid-semester break
Back to Studio on Monday 18th September