



EF Lunch & Learn 2020
Cristina Ramos Jaime



Curriculum / Course Design

What **knowledge** do I want my students to be able to **apply** when they have completed my course?

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- A** Course structure **well-organized and coherent** > Constructive Alignment
- B** Acquisition of relevant **knowledge and skills** to solve **real-world problems** > CLOs
- C** **New knowledge** > What the student **DOES** before, during, and after class > **Active Learning**
- D** **All students** can achieve a **deep level of learning** > Create new **long-term knowledge**

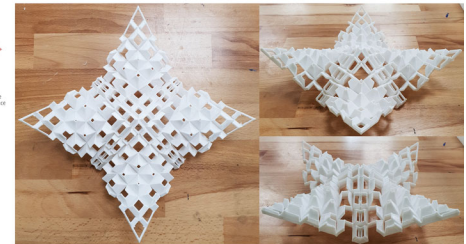
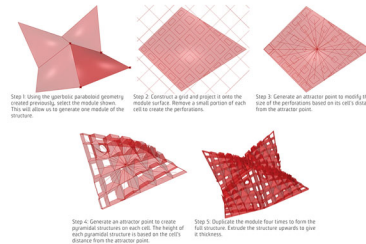
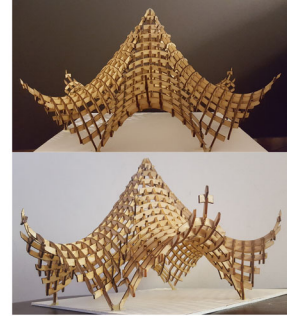
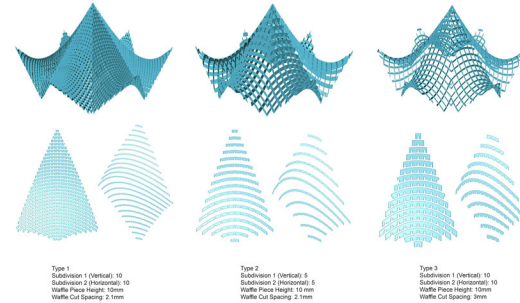
Students have...

- E** ...Different **interests** > Get to know them! > Design **engaging** lectures, activities and assessments
- F** ...Different **ways to assimilate new concepts** > Communicate using **multiple means of representation**
- G** ...Different **learning rhythms** > Ensure and check that **everyone can comfortably follow the class**
- H** ...Different **strengths and abilities** > Allow them to express their ideas using **multiple formats**
- I** ...The ability to **take responsibility of their own learning** > Encourage **independency**

BENV1012_Parametric Design and Digital Fabrication

1_Problem statement

- Provide knowledge on **Parametric Design**
 - > Adaptable/Flexible 3D models (Grasshopper)
 - > Project documentation (Rhinceros)
- Introduction to **Digital Fabrication**
 - > Connection between design and manufacture
 - > Rationalization of complex geometries
 - > Fabrication of buildable parts



BENV1012_Parametric Design and Digital Fabrication

2_Methodology

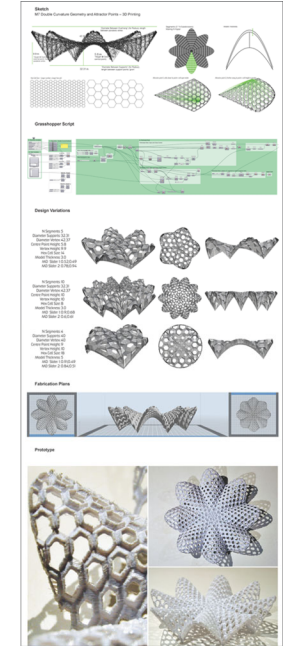
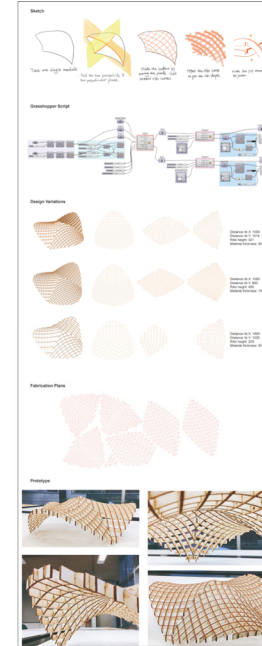
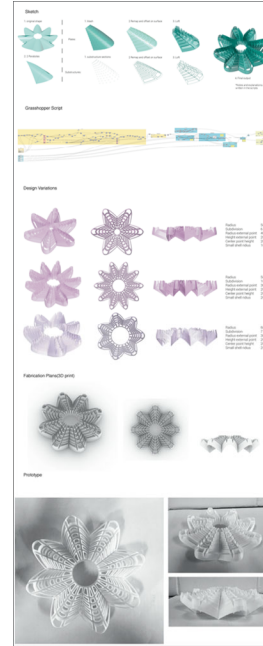
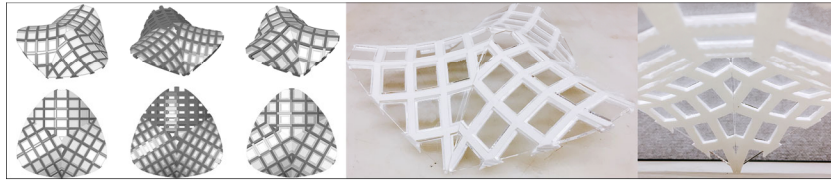
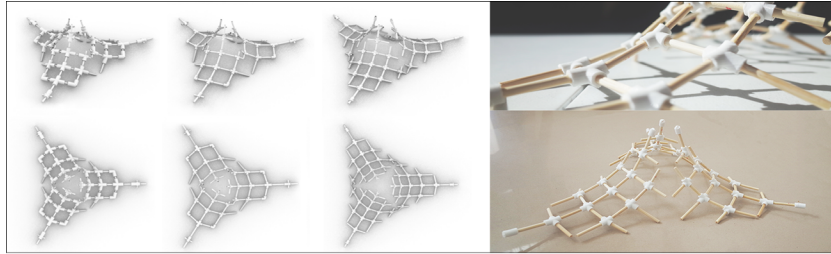
- **Prior to class** > Research exercise > **Getting ready** for the upcoming session
- **In the Lecture** > Key **theoretical concepts** + Short **practical exercises**
- **In the Tutorial** > Scripting together! > **Work-along exercises** in your own laptop
- **In the Studio** > Explore the tool! > Develop your own **parametric designs**
- **After class** > Hands on! > Translate your digital work into a **physical prototype**

Course Structure > Lectures, activities and assessments strongly linked

Assessments & Feedback > Formative weekly tasks (Script+Poster+Prototype) > Progressive learning

BENV1012_Parametric Design and Digital Fabrication

3_Results and Feedback



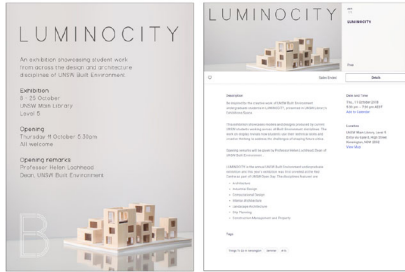
BENV1012_Parametric Design and Digital Fabrication

3_Results and Feedback

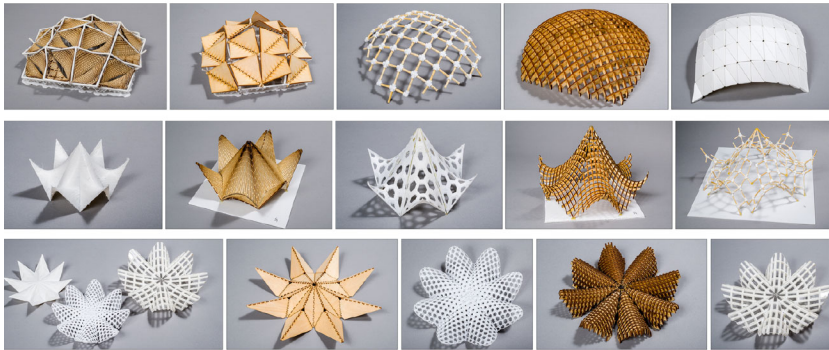


BENV1012_Parametric Design and Digital Fabrication

3_Results and Feedback



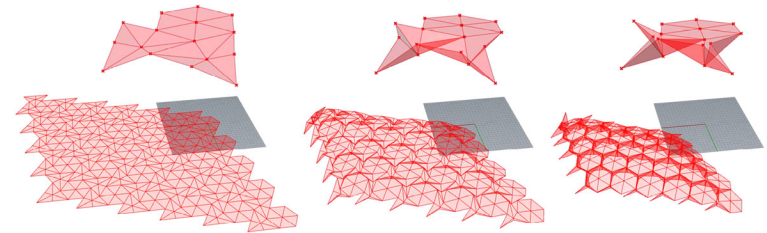
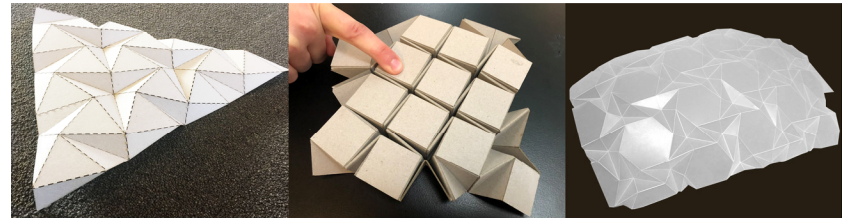
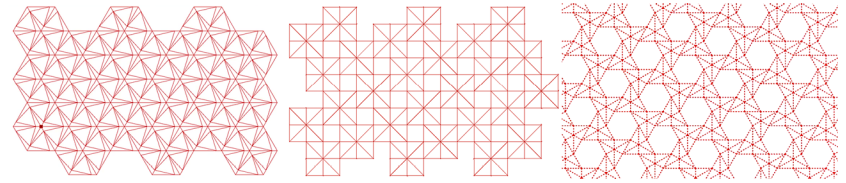
- Doesn't include any activity for **reflection**, analysis or evaluation > New task > Short reflective statement > Improvements based on results
- Optimize Face-to-face **consultation time** > **Blended** delivery using a *flipped class* format
- **Short video-tutorials** work better
- Digital Fabrication Lab is a **busy space** > Reduce number prototypes > Use renders



CODE2250_Advanced Digital Fabrication

1_Problem statement

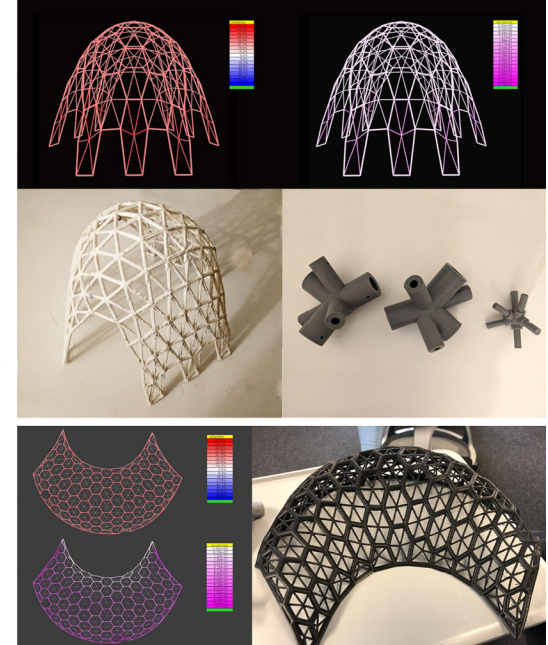
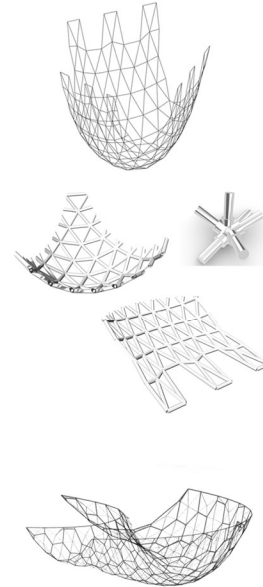
- **Real-world projects** > ARUP Engineering > Office transformable pod
- Knowledge in Digital Fabrication (advanced level) > CNC mills; **Novel material systems**; Inflatables; **Responsive installations**
- **Prototypes** at different scales
- **Structural design** and Topology optimization
- **Live-physics simulation**



CODE2250_Advanced Digital Fabrication

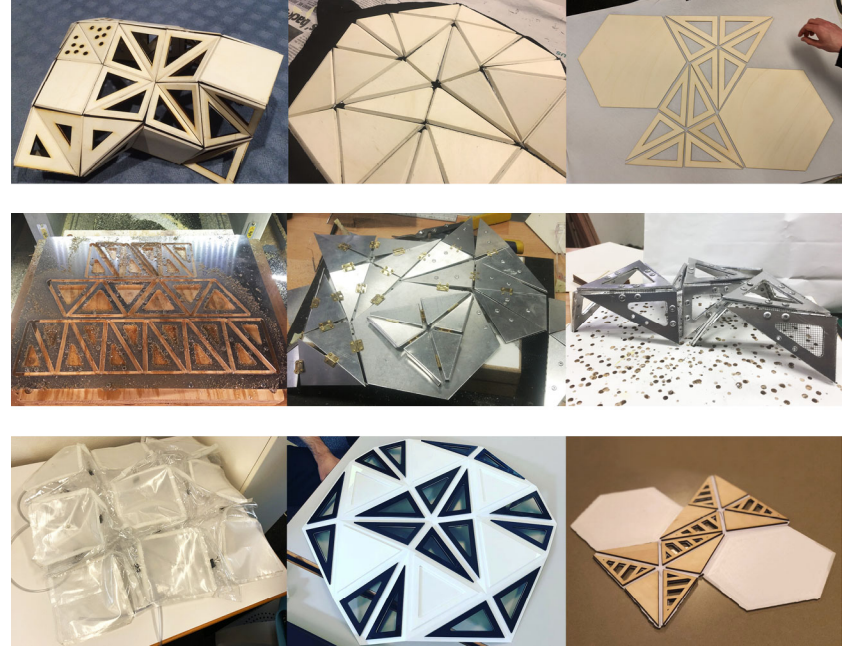
2_Methodology

- Research and Design of **Kinetic Systems**
- **Structural Analysis** and Topology Optimization
- **Material Exploration** and Prototyping at small and medium scales
- **Fabrication management** > Times and resources
- Digital **Model for Fabrication**
- **Mock-up** at 1:1 scale



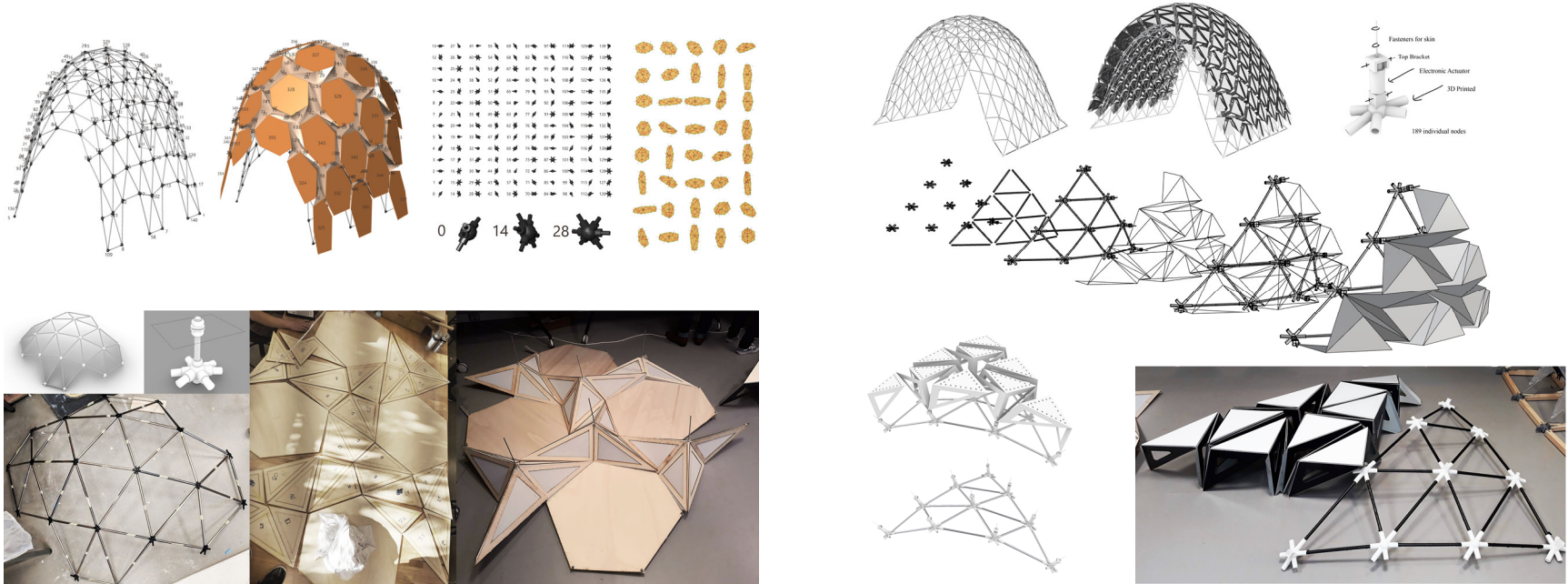
CODE2250_Advanced Digital Fabrication

3_Results and Feedback



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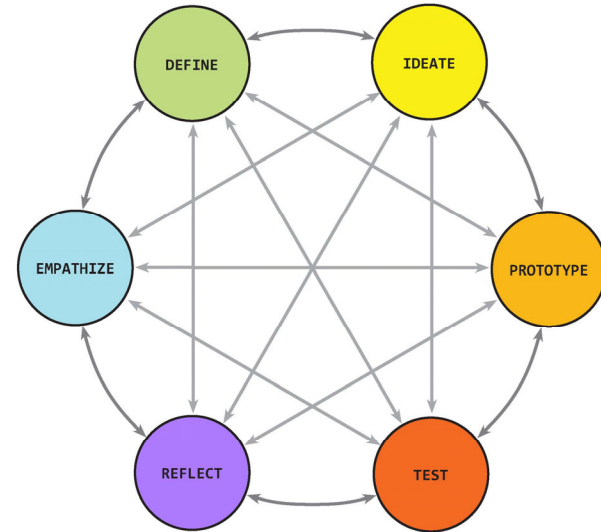
3_Results and Feedback



CODE1240_Computational Design Studio II

1_Problem statement

- **Design Thinking** > Iterative methodology > Users' needs > Context, culture and resources
- Solve **real-world challenges** in the field of **Humanitarian Architecture**
- Analysis of **environmental conditions** > **Efficiency** of architectural solutions
- **Optimization** > Energy resources and Spatial performance
- Flexible designs **replicable** in similar contexts



Computational Design Thinking

Adaptation of the process developed by the Institute of Design at Stanford

CODE1240_Computational Design Studio II

2_Methodology

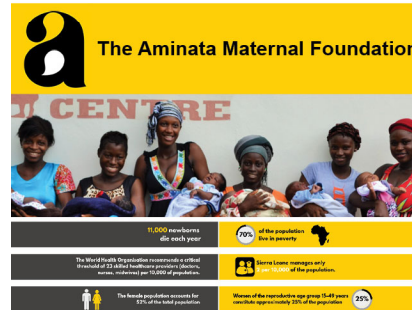
- Reflect + Research > **Humanitarian Global Challenge + NGOs + Active Projects**
- **Interview** NGOs > Defining the brief
- **Ideation** workshops > Quick sketches: Radical ideas to meet users' needs > Reflect
- **Present** your ideas to the NGO > **Gain feedback** > Reflect > Final group solution
- **Break** the project into small Computational Design Challenges > Develop your script
- **Optimize** your solution > Efficiency



Papua New Guinea Schools Project



Modular Homes for Women experiencing Homeless



Medical Care for Pregnant Women in Sierra Leone



Early Childhood Development in Cambodia

CODE1240_Computational Design Studio II

3_Results (work in progress)



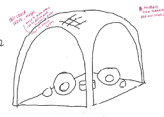
3rd semester

LEVEL OF AMF - 10/10/19

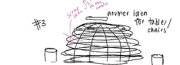
highlight in foreground



1. HANGOUT AREA
FOR VISITORS
TO GET A FEEL OF THE PLACE
AND TO BE INFORMED BY THE STAFF



2. HANGOUT AREA
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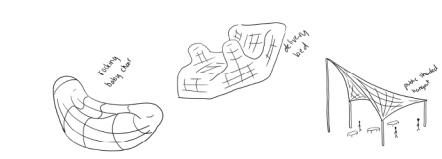
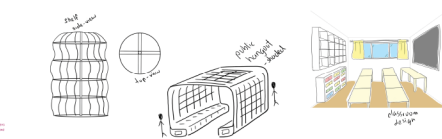


#1. tree installation to save space



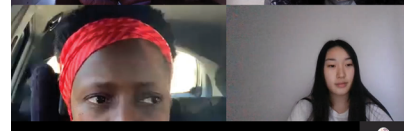
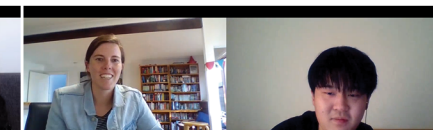
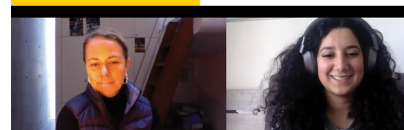
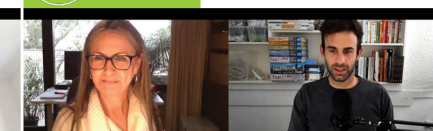
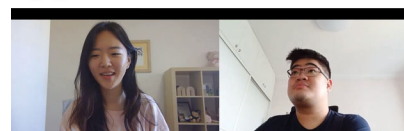
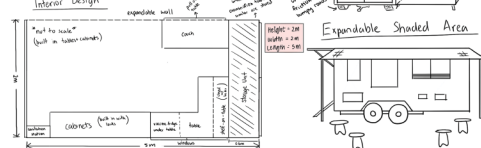
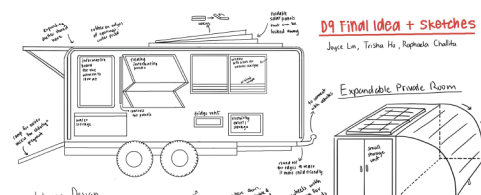
After making the final design, we realized that we had not given enough thought to the tree installation and we decided to install it in a way that it would be a focal point and also a way to save space.

Overall
The design is a simple and functional structure that provides a space for visitors to get a feel of the place and to be informed by the staff. It is a good example of how a simple design can be effective.



D9 Final Idea + Sketches

Joyce Lim, Toshiro Ho, Raphaela Chhabra

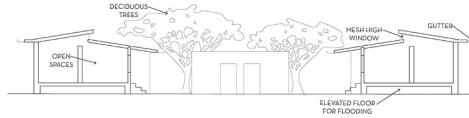


CODE1240_Computational Design Studio II

3_Results (work in progress)



PNG Schools Project



- 1** Modular frame design
1.2-4.8m lengths with fixed width/height.
- 2** Modular house design
Internal and external components, based on preferences/budget.
- 3** Site allocation
Optimising for distance between each home.
- 4** Privacy
Optimising for the alignment of homes and screenings.

