Curriculum / Course Design

What knowledge do I want my students to be able to apply when they have completed my course?
Curriculum / Course Design

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

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 (Rhinoceros)

- 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

- 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
CODE2250_Advanced Digital Fabrication

3_Results and Feedback
CODE2250_Advanced Digital Fabrication

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
CODE1240_Computational Design Studio II

3_Results (work in progress)
CODE1240_Computational Design Studio II

3_Results (work in progress)