



2018 | BEIL0014 | ELECTIVE
Course Outline

CoDe PROGRAM
Computational Design

ELECTIVE TITLE: DIGITAL MAKING

CONVENOR: RUSSELL LOWE



UNSW
SYDNEY

Built Environment

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Course staff

- Convenor: Russell Lowe

email: russell.lowe@unsw.edu.au

Tutors:

Daniel Falzon
Martin Boehnel
Gabriel Undery

Course details

- 6 UOC
- 3 Hours per week contact time

(Expected student workload: 25-30 hours per unit of credit as determined by the UNSW Academic board. Differently put, this course requires approximately 150 to 180 hours of work across 12 weeks.)

Elective location and class time

- Wednesday's 14:00 – 17:00 (weeks 2-7, 8-13)
- FBE Studio Squarehouse 103 (K-E4-103)
- FBE Design Lab
- FBE FabLab

Course aims/Handbook description

Through new methods in designing objects and spaces, new challenges in making and creating the objects and spaces arise. Digital design and fabrication promises new ways of designing, different, cheaper and faster but are these predictions real promises or are they are misleading the future designer and builder? The studio sees only one way to get an answer to the questions raised above – through digital making! Consequently the studio engages in designing an installation using digital and parametric design tools, and building the outcome as a 1:1 mock-up and answering the question by exploring what is possible and what are only promises. A project with this complexity requires experts from different disciplines. It is not only about the design but also about managing the project, understanding the constraints of construction methods and materials, structural and building regulation and their demands and understanding details from an aesthetic to fabrication point. This is digital making of the 21st century.

Studio Description

For 2018 this elective will focus on three parts of the digital making ecosystem; material, form and shape. The material we will use is thin aluminium sheet. With this material our available processes are few (cutting, bending, shrinking, stretching) but the outcomes possible from the determined, skilful and creative combination of them is almost limitless. Students will be directed to tutorials, samples and demonstrations online and develop skills in 'reading' and evaluating them. A series of 'test' or 'practice' pieces will demonstrate proficiency. Following these students will form interdisciplinary teams to create a 1 to 1 replica of a motorcycle

fuel tank. They will use the originals supplied to create a 3d model using photogrammetry. They will then create sections that can be laser cut and assembled to form a 3d template. Through understanding and applying the few available process mentioned above each student will manipulate the aluminium sheet using simple hand tools so that it closely adheres to parts of their teams template. The evaluation of each students work will be based on quantitative measurements (using a variety of measuring tools) and qualitative documentation (in the form of original tutorials that they create).

Assessment will be based on the physical artefacts themselves and representations of them.

Student learning outcomes

By the end of the course the students will have skills in:

- Form comprehension
- Thinking through making.
- Laser cutting.
- CNC routing.
- Care and precision in fabrication.
- Care and precision in metal shaping.
- Measuring including selecting the appropriate measuring tool.
- Critically documenting a making process.
- Interdisciplinary communication.
- Safe working practices.

Reference Material

Books

Professional Sheet Metal Fabrication, By Ed Barr

<https://books.google.com.au/books?id=boE573NdPmQC&printsec=frontcover#v=onepage&q&f=false>

Videos

Lazzemetalshaping:

Introduction: <https://youtu.be/PkrGKuF8lh0>

English Wheel Basics: <https://youtu.be/hePmCEjDSu4>

Wray Schelin:

Jaguar Mini Fender: <https://youtu.be/xeXtezrmK3M>

Ron Covell:

Hammer Forming: <https://youtu.be/sraA6x1Swy4>

Basic Metal Shaping Techniques: <https://youtu.be/1bWZkzsWsg>

Instagram Users:

detmer_metalshaping

metalmán_sweden
revivecustommotorcycles
saltflatsspeedshop
marknugent.com.au
thewilliamblake
metalshapes_bymarko
extraordinary_metalshaping
sosametalworks
proshaper
sparmi
BensMetalshapingShop

Hashtags

#metalshaping

#stumpshrinking

#tuckshrinking

#englishwheel

Assignments

Submission Number	Weighting/Submission Date	Description	Rational in relation to the learning outcomes
Assignment 1: The bowl, torus, tray and blister	40% submit on April 18 th by 23:59	Create an aluminium skin to adhere to the contours of a bowl, torus, tray and blister.	Skill development; form comprehension; documentation;
Assignment 2: The 1:1 Fuel Tank.	40% submit on May 23 rd by 23:59	As a team students will create a 1:1 scale template replicating a motorcycle fuel tank and then divide it into thirds. As individuals they will create an aluminium skin to adhere to their third of its contours.	Skill development; form comprehension; documentation; Interdisciplinary communication.
Assignment 3: Reflection.	20% submit on June 13 th by 23:59	Choose one of your projects and critically review it using images, video, text and drawings to reveal strengths, weaknesses and alternatives to your approach, techniques and tools.	Critical documentation of the process and outcome.

Assessment Criteria

In general, your work will demonstrate the application and integration of your skills in laser cutting, assembly, metal shaping and documentation. The course is assessed by assignment work based on the submissions set throughout the Session. All of these assessments are based on individual work presented via each students blog and in person. Your work will be assessed based on frameworks described in the Feedback and Review sheets below.

Course schedule and content

WEEK	CLASS	DATE	TUTORIAL ACTIVITIES
1	1	Wednesday, February 28th	<p>Introduction and Discussion regarding Digital Making, Form Comprehension and Metal Shaping: The BEIL0014 Course outline fully explained. Questions and answers between the course convenor, tutors and the students.</p> <p>Introduction to the Workshop and FabLab staff: Tours and background information regarding facilities and techniques.</p>
2	2	Wednesday, March 7th	The Bowl: finish bowl by the next class.
3	3	Wednesday, March 14th	The Torus: finish torus by the next class.
4	4	Wednesday, March 21st	The Tray: Fabricate tray hammer form and finished shape by the next class.
5	5	Wednesday, March 28th	The Blister: Fabricate blister hammer form and finished shape by the next class.
6			BE Non-Teaching Week
			Easter Break
7	6	Wednesday, April 18th	<p>Submit Assignment 1 by 23:59</p> <p>Intro to Assignment 2: The 1:1 fuel tank.</p> <p>Team selection.</p> <p>Use photogrammetry to create a 3d model of your chosen fuel tank. Cut and assemble template by the beginning of the next class (May 2nd).</p>
8	7	Wednesday, April 25th	ANZAC Day
9	8	Wednesday, May 2nd	Divide the form of the fuel tank into thirds. Begin patternmaking and shaping.
10	9	Wednesday, May 9th	Shape forms.
11	10	Wednesday, May 16th	Shape forms.
12	11	Wednesday, May 23rd	Complete Documentation. Submit Assignment 2 by 23:59
13	12	Wednesday, May 30th	Intro to Assignment 3: Reflection. Gather documentation, prepare supporting text. Submit Assignment 3 on June 13 th by 23:59

Studio Blog

Information in this course outline is subject to change at the discretion of the course convenor. Students enrolled in this course are required to check the following blog site on the regular basis to receive updates and further instructions for this studio:

<http://beil0014-2018.blogspot.com.au/>

Post links to your own blog as comments on the blog post entitled: “Your Digital Making Blogs”, here:

<http://beil0014-2017.blogspot.com.au/2018/01/your-digital-making-blogs.html>

note: As almost all of the assessment is via your blog it is important that we can gain access to it, so please double check your links to make sure they work properly before including them in the post mentioned above.

Grades and Marks

In accordance with the university policy the distribution range of marks in relation to grades and their descriptor are as follows.

<i>Grade</i>	<i>Mark Distribution</i>	<i>Academic Standard</i>
HD - High Distinction	85 - 100	Outstanding performance
DN - Distinction	75 - 84	Superior performance
CR - Credit	65 - 74	Good performance
PS - Pass	50 - 64	Acceptable performance
PC – Pass Conceded	45 - 50	Borderline performance
FL - Fail	0 - 45	Failure: performance below minimum level of competence
AF – Absent Fail	0	The student has not completed any assessment. Subsequent submission of work will not be accept
WJ		Assessment withheld due to academic misconduct.

ADMINISTRATIVE MATTERS

The Built Environment Protocols and UNSW Policies & Procedures document supplements this course outline providing detail on academic policies and other administrative matters. It is your duty as a student to familiarise yourself with the policies and guidelines as not adhering to them will be considered as academic misconduct. Ignorance of the rules is not an acceptable defence.

The document can be found in your Moodle course as well as:

<https://intranet.be.unsw.edu.au/student/be-learning-teaching/academic-policies>

It covers:

- Built Environment Student Attendance Requirements
- Units of Credit (UOC) and Student Workload
- myExperience Course and Teaching Evaluation
- Academic Honesty and Plagiarism
- Late Submissions Penalties
- Special Consideration - Illness & Misadventure
- Extension of Deadlines

- Learning Support Services
- Policies and Procedures for Research Candidates
- Health & Safety

Feedback and Review Sheet: The Bowl, Torus, Tray and Blister

STUDENT NAME:	
TUTOR:	
WEIGHTING:	40%

CRITERIA	SCALE 1-5: (5 is better than 1).				
	1	2	3	4	5
1. Templates - are the templates designed, cut, and assembled with care and precision?					
2. Metal shaping – is there evidence to support that the skins adhere closely to the contours of their templates?					
3. Metal shaping – are the skins beautiful?					
4. Documentation - is the documentation comprehensive, clear and aesthetically pleasing?					

HD	DN	CR	PS	FL	LF	AF	GRADE
85- 100%	75-84%	65-74%	50-64%	35-49%	1-34%	No Submit	

Feedback and Review Sheet: The 1:1 Fuel Tank

STUDENT NAME:					
TUTOR:					
WEIGHTING:	40%				
FUEL TANK	Harley Davidson (1.0x)		Custom (1.25x)		Yamaha (1.25x)

CRITERIA	SCALE 1-5: (5 is better than 1).				
	1	2	3	4	5
1. Template - is the templates designed, cut, and assembled with care and precision?					
2. Patterns – do the patterns demonstrate good form comprehension?					
3. Metal shaping – does the skin adhere closely to the contours of the template?					
4. Documentation - is the documentation comprehensive, clear and aesthetically distinctive?					

HD	DN	CR	PS	FL	LF	AF	GRADE
85- 100%	75-84%	65-74%	50-64%	35-49%	1-34%	No Submit	

Feedback and Review Sheet: Reflection

STUDENT NAME:	
TUTOR:	
WEIGHTING:	20%

CRITERIA	SCALE 1-5: (5 is better than 1).				
	1	2	3	4	5
1. Documentation – is the documentation comprehensive?					
2. Documentation – does the documentation demonstrate a range of media?					
3. Reflection – has the student demonstrated the strengths and weaknesses of their approach, technique or tools used?					
4. Reflection – has the student demonstrated alternatives to their approach, technique or tools used?					

HD	DN	CR	PS	FL	LF	AF	GRADE
85- 100%	75-84%	65-74%	50-64%	35-49%	1-34%	No Submit	