



2016 | BEIL0014 | ELECTIVE
Course Outline

CoDe PROGRAM
Computational Design

ELECTIVE TITLE: DIGITAL MAKING

CONVENOR: RUSSELL LOWE

Contents

Course staff	2
Course details.....	2
Elective location and class time	2
Course aims/Handbook description	2
Studio Description	2
Student learning outcomes	3
Assignments.....	4
Assessment Criteria	4
Course schedule and content.....	5
Workshop Modules.....	6
Studio Blog	7
Grades and Marks	8
ADMINISTRATIVE MATTERS.....	8
Feedback and Review Sheet: First Template and Skin.....	9
Feedback and Review Sheet: Interdisciplinary Skin.....	10
Feedback and Review Sheet: Original Tutorials and Reflection	11

Course staff

- Convenor: Russell Lowe

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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

- Tuesday 13:00 – 16:00
- 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 2016 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 find tutorials, samples and demonstrations online and develop skills in ‘reading’ and evaluating them. Following online courses in moodle students will be expected to enrol in practical sessions. Successfully completing these courses will be mandatory. A series of ‘test’ or ‘practice’ pieces will demonstrate proficiency. Following these each student will take an existing object (with a particular disciplinary connection) and use <http://www.123dapp.com/catch> to create 3d scans. They will then use <http://www.123dapp.com/make> to turn those scans into 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 their 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). Finally, each student will pair up with a student from another discipline and by following their tutorial attempt to replicate their outcome.

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:

- Thinking through making.
- Photogrammetry.
- Laser cutting.
- 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.

Assignments

Submission Number	Weighting/Submission Date	Description	Rational in relation to the learning outcomes
Assignment 1: Completion of ALL Online Moodle Modules.	0% (But must complete by 15 April or will fail the course)	Online Moodle Modules including Basic Workshop induction and FabLab induction.	Safe working practices; theory introduction; workshop access.
Assignment 2: Completion of ALL Practical Tuition.	0% (But must complete by 15 April or will fail the course)	Practical Tuition sessions relating the Moodle Modules as described above.	Safe working practices; practical introduction; workshop access.
Assignment 3: First template and skin.	50% submit on 26 April by 23:59	Create an aluminium skin to adhere to the contours of a 3d template based on a disciplinarily relevant found object	Skill development; form comprehension; documentation;
Assignment 4: Interdisciplinary skin.	25% submit in week 10	Create an aluminium skin to adhere to the contours of another students 3d template.	Skill development; form comprehension; documentation; Interdisciplinary communication.
Assignment 5: Original tutorials and reflection.	25% submit in week 13.	Create 2 tutorials that would enable a third party to more efficiently create a similar outcome.	Critical documentation of the process and outcome.

Assessment Criteria

In general, your work will demonstrate the application and integration of your skills in photogrammetry, 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
2	1	Tuesday, 08 March	<p>Introduction and Discussion regarding Digital Making and Metal Shaping: The BEIL0014 Course outline fully explained. Questions and answers between the course convenor, tutors and the students.</p> <p>Introduction to Moodle Modules: overview of the Moodle modules.</p> <p>Introduction to the Workshop and FabLab staff: Anthony Jones, Peter Kolasinski, Kin Ly.</p> <p>Complete all Moodle modules. Enrol in the practical tuition components. Find an object which relates to your discipline that offers appropriate and interesting surfaces.</p>
3	2	Tuesday, 15 March	Complete Workshop or Fablab inductions.
4	3	Tuesday, 22 March	Complete Workshop or Fablab inductions. Test cut, test assembly, test shaping.
	Mid Semester Break		
5	4	Tuesday, 05 April	Complete Workshop or Fablab inductions. Test cut, test assembly, test shaping.
6	5	Tuesday, 12 April	Have completed the ALL practical sessions by the end of this week. Begin work towards final version of Assignment 3.
7	6	Tuesday, 19 April	Continue working on Assignment 3.
8	7	Tuesday, 26 April	Submit Assignment 3 by 23:59
9	8	Tuesday, 03 May	Pair up with a student from another discipline, in pairs produce some test shapes.
10	9	Tuesday, 10 May	Begin work towards final version of Assignment 4.
11	10	Tuesday, 17 May	Submit Assignment 4 by 23:59
12	11	Tuesday, 24 May	Gather documentation, prepare supporting text.
13	12	Tuesday, 31 May	Submit Assignment 5 by 23:59

Workshop Modules

COMPULSORY BE Square House Access Modules

In order for you to use the 24 hour space, Workshop and/or FabLab at the Square House, you will need to complete the following modules.

1. [BHSM001: BE Health & Safety Induction Basics](#)
2. [BHSM006: Model Making Fundamentals](#)
3. [BHSM007: Hot Wire Cutters 1](#)

BE Workshop Access Modules

In order for you to use the Workshop at the Square House, you will need to complete the following modules.

Workshop	Modules
<p>COMPULSORY Workshop Training</p> <p>You must complete these modules to gain access to the Workshop.</p>	<ul style="list-style-type: none">• BESM004: BE Workshop Space Induction
	<p>Sheet Metal - Learn how to work with sheet metal</p> <ul style="list-style-type: none">• Cut• Fold• Roll <p>Click here for the Sheet Metal module.</p>

BE FabLab Access Modules

In order for you to use the FabLab at the Square House, you will need to complete the following modules.

FabLab	Modules
<p>COMPULSORY FabLab Training</p> <p>You must complete these modules to gain access to the FabLab.</p>	<ul style="list-style-type: none">• BHSM012: BE FabLab Space Induction (Squarehouse)• BHSM013: 3D Printing - Up Plus 2 and Makerbot Replicator 2• BHSM015: Laser Cutting - VLS 3.50• BHSM_FL: Ready for FabLab Induction

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://beil0014-2016.blogspot.com.au/>

Post links to your own blog as comments on the blog post entitled: "Student Blogs", here:

<http://beil0014-2016.blogspot.com.au/2016/02/student-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 expectations 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:

<http://www.be.unsw.edu.au/student-intranet/academic-policies>

It covers:

- Built Environment Student Attendance Requirements
- Units of Credit (UOC) and Student Workload
- Course and Teaching Evaluation and Improvement (CATEI)
- Academic Honesty and Plagiarism
- Late Submissions Penalties
- Special Consideration - Illness & Misadventure
- Extension of Deadlines
- Learning Support Services
- Occupational Health & Safety

Feedback and Review Sheet: First Template and Skin

STUDENT NAME:	
TUTOR:	
WEIGHTING:	50%

CRITERIA	SCALE 1-5: (5 is better than 1).				
	1	2	3	4	5
1. Found object – does the found object reflect the students discipline in some way?					
2. Photogrammetry – has the student created an accurate 3d model?					
3. Template - is the template designed, cut, and assembled with care and precision?					
4. Template - is the template fit for purpose?					
5. Scale - is the scale appropriate?					
6. Metal shaping – does the skin adhere closely to the contours of the template?					
7. Metal shaping – is the skin beautiful?					
8. 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: Interdisciplinary Skin

STUDENT NAME:	
TUTOR:	
WEIGHTING:	25%

CRITERIA	SCALE 1-5: (5 is better than 1).				
	1	2	3	4	5
1. Metal shaping – does the skin adhere closely to the contours of the template?					
2. Metal shaping – is the skin beautiful?					
3. Documentation - is the documentation comprehensive, clear and aesthetically pleasing?					
4. Reflection – has the student reflected on potential differences in content or approach that might suggest discipline specificity?					

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: Original Tutorials and Reflection

STUDENT NAME:	
TUTOR:	
WEIGHTING:	25%

CRITERIA	SCALE 1-5: (5 is better than 1).				
	1	2	3	4	5
1. First Tutorial – does the tutorial facilitate replication of the students work?					
2. Interdisciplinary Tutorial – does the tutorial facilitate replication of the second students work?					
3. Reflection – has the student reflected on potential differences in content or approach that might suggest discipline specificity?					

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