Slipcasting and 3D Printing

Matt Greco, Queens College Art
Christopher Hanusa, Queens College Mathematics
Course Philosophy

• Ceramics students with varying abilities
• Hands-on experience in 3D modeling
• Learn about 3D printing process
• Practice with ceramics techniques
• Follow an idea from conception to realization
**Course Philosophy**

- Ceramics students with varying abilities
- Hands-on experience in 3D modeling
- Learn about 3D printing process
- Practice with ceramics techniques
- Follow an idea from conception to realization

**Unique feature:**

Contrast between the **traditional** technique of **slipcasting** and the **modern** technique of **3D printing**
Casting Using Molds

- An ancient technique
- Mold: A negative shape of an object
Casting Using Molds

• An ancient technique
• Mold: A negative shape of an object
• Fill with a liquid, let harden
Slipcasting

• Use a plaster mold
• Fill with slip (a special liquid clay)
Slipcasting

• Use a plaster mold
• Fill with slip (a special liquid clay)
• Wait . . . . .
Slipcasting

• Use a plaster mold
• Fill with **slip** (a special liquid clay)
• Wait . . . . .
• **Pour out** excess slip.
Slipcasting

- Use a plaster mold
- Fill with **slip** (a special liquid clay)
- Wait . . . . .
- **Pour out** excess slip.
- Wait . . . . .
Slipcasting

• Use a plaster mold
• Fill with slip (a special liquid clay)
• Wait . . . . .
• Pour out excess slip.
• Wait . . . . .
• Extract from mold
Making the Mold

• One piece

• or two?
Making the Mold

• One piece
  • No overhangs or undercuts

• or two?
Deliverables

• 3D Modeled Cup and Bowl
• 8 Glazed castings of each
Class Structure

Week 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Skills Taught

3D Design

Mold Making

Slipcasting

Firing

Glazing
Class Structure

Skills Taught

- 3D Design
- Cup Design

Mold Making

Slipcasting

Firing

Glazing

3D Design

- Sketch on paper
- Digitize using Fusion 360
Week  1      2      3      4      5      6      7      8      9     10     11     12     13     14     15

Intro

Cup Design

3D Design

Skills Taught

3D Design

• Sketch on paper
• Digitize using Fusion 360
• Add a lip
• Ensure manifold
• Create a solid 3D print
Class Structure

Week 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Intro

Skills Taught

3D Design

Cup Design

Slipcasting, Mold Making

Cup Mold

3D Design
Mold Making
Slipcasting
Firing
Glazing
# Class Structure

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**Mold Making**

- Embed 3D print in clay
Weeks 1-15

Skills Taught:
- 3D Design
- Mold Making
- Slipcasting
- Firing
- Glazing

Mold Making
- Embed 3D print in clay
Class Structure

Slipcasting and 3D Printing                             Christopher Hanusa, Queens College  @mathzorro

Week   1      2      3      4      5      6      7      8      9     10     11     12     13     14     15
Intro

3D Design
Cup Design

Skills Taught
3D Design
Mold Making
Slipcasting
Firing
Glazing

Mold Making
• Embed 3D print in clay
• Pour plaster over model
• Wait for it to set
Week 1
Intro

Skills Taught
- 3D Design
- Mold Making
- Slipcasting
- Firing
- Glazing

Mold Making
- Embed 3D print in clay
- Pour plaster over model
- Wait for it to set
- Extract 3D print
Week 1
- Intro
- 3D Design
- Cup Design

Skills Taught
- 3D Design
- Mold Making
- Slipcasting
- Firing
- Glazing

Mold Making
- Embed 3D print in clay
- Pour plaster over model
- Wait for it to set
- Extract 3D print
- A mold!

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- Christopher Hanusa, Queens College
- @mathzorro
Week 1:
- Intro

Week 2:
- Cup Design

Week 3:
- 3D Design

Week 4:
- Cup Mold

Skills Taught:
- 3D Design
- Mold Making
- Slipcasting
- Firing
- Glazing

Mold Making:
- Embed 3D print in clay
- Pour plaster over model
- Wait for it to set
- Extract 3D print
- A mold! (That has to dry)
# Class Structure

## Skills Taught

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Class Structure

Week 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

- **Intro**

**Skills Taught**
- 3D Design
- Mold Making
- Slipcasting
- Bowl Mold
- Bowl Design
- Cup Mold
- Cup Design
- Slipcasting, Mold Making

3D Design
- Cup Design
- Bowl Design

Mold Making
- Cup Mold
- Bowl Mold

Slipcasting

Firing

Glazing
## Class Structure

### Skills Taught

- **3D Design**
  - Cup Design
  - Bowl Design
- **Mold Making**
  - Cup Mold
  - Bowl Mold
- **Slipcasting**
  - Slipcasting, Drying
- **Ceramics, Glazing**

### Week Schedule

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<tr>
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<th>3D Design</th>
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Slipcasting

- First few prints season the mold
- Make **more** than eight of each
Slipcasting and 3D Printing

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**Week 1**

**Introduction**

**Skills Taught**

- 3D Design
- Mold Making
- Slipcasting
- Firing
- Glazing

**Assignment**

- Cup Design
- Bowl Design

**Slipcasting, Drying**

- First few prints season the mold
- Make more than eight of each
- Outside class time (community)
- Set prints to dry (greenware)
Class Structure

Week 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Skills Taught:
- Intro
- 3D Design
- Mold Making
- Slipcasting
- Firing
- Glazing

3D Design:
- Cup Design
- Bowl Design

Mold Making:
- Cup Mold
- Bowl Mold

Slipcasting:
- Slipcasting, Drying

Ceramics, Glazing
Class Structure

Week 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Skills Taught
- 3D Design
- Slipcasting, Mold Making
- Ceramics, Glazing

3D Design
- Cup Design
- Bowl Design

Mold Making
- Cup Mold
- Bowl Mold

Slipcasting
- Slipcasting, Drying

Firing
- Multiple Firings

Glazing
- Glazing

Showcase
Class Structure

Week  1      2      3      4      5      6      7      8      9     10     11     12     13     14     15

Skills Taught
- 3D Design
- Cup Design
- Mold Making
- Slipcasting
- Firing
- Glazing

3D Design
- Cup Design

Mold Making
- Cup Mold
- Bowl Mold

Slipcasting
- Slipcasting, Drying
- Multiple Firings

Firing
- Glazing

Finishing
- Fire once (Bisqueware)

Showcase

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Class Structure

Week 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Intro

Skills Taught

3D Design

Cup Design

Mold Making

3D Design

Cup Mold

Bowl Mold

Slipcasting

Slipcasting, Drying

Firing

Glazing

Glazing

Multiple Firings

Finishing

- Fire once (Bisqueware)
- Glaze and fire again (Glazeware)
- Lots of experimentation, testing and practice. Use failed prints!

Showcase
Class Structure

Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15
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**Intro**

**Skills Taught**
- **3D Design**
  - Cup Design
  - Bowl Design
- **Mold Making**
  - Cup Mold
  - Bowl Mold
- **Slipcasting**
  - Slipcasting, Drying
- **Firing**
- **Glazing**

**Ceramics, Glazing**

**Multiple Firings**

**Showcase**

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Showcase

Slipcasting and 3D Printing

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Showcase Slipcasting and 3D Printing

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Final Thoughts

- Materials paid through mandatory art class fee
- Grading:
  - 20% Solid 3D Prints
  - 20% Shell 3D Prints
  - 20% Plaster Molds
  - 40% Entire Portfolio
Final Thoughts

- Materials paid through mandatory art class fee
- Grading: (effort, complexity, completeness)
  - 20% Solid 3D Prints  
  - 20% Shell 3D Prints
  - 20% Plaster Molds  
  - 40% Entire Portfolio

- What an experience!
- Encourages us all to slow down