Course Description:
This two week, 2-credit elective is designed to provide the fourth-year medical student with basic competencies in 3D modeling and printing using medical imaging data. The student will assess medical scan data to determine the appropriate method for the 3D conversion. Collaboratively, the student will explore applications of relational thinking as it applies to the 3D modeling process and everyday medical practice. At the end of the rotation, the student will be given a case-study to examine, diagnose and develop a 3D application for the prognosis.

Registration is through the School of Medicine department. [For further information, contact kate.m.serralde@ttuhsc.edu]

Objectives:
Objective I: The student demonstrates an ability to problem solve, interpret, and apply critical thinking skills by interpreting medical data scans and applying the appropriate 3D modeling conversion.
Objective II: To foster the development of collaborative, critical thinking, and decision-making skills through an open forum involving group discussions, case-study evaluations, and presentations.
Objective III: To provide opportunities for students to access and explore the latest technology in 3D printing.

Course Requirements:
- Careful and timely study of assigned readings, class attendance, and engaged class participation.
- 40%: Two 3D printed models: Ultrasound Conversion to .stl (10 points), CT Scan Conversion to .stl (10 points), two article summaries (10 points each)
- 60%: Final Project Case Study Diagnosis and 3D Model

Tentative Course Schedule:

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Handouts</th>
<th>Required Reading</th>
<th>Recommended Reading</th>
<th>Assignments</th>
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</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>Introduction Discussion: Creative Process, Principles of Sculpture, Composition, and Presentation</td>
<td>Converting an Ultrasound Principles of Sculpture Presentation Basics</td>
<td>Mistouras, 2015 Bibb, ch3 Udupa, ch1, 2</td>
<td>Reading for next day discussion Cave of Forgotten Dreams (Watch before day 5) Dutton, Ted Talk (Watch before day 5)</td>
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<td>Day 2</td>
<td>Discussion: 3D Imaging Basics</td>
<td>Basics of 3D Printers</td>
<td>Udupa, ch 6 Fedorov, 2012: Hashem, 2015</td>
<td>Reading for next day discussion</td>
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<td>Day 3</td>
<td>Discussion: 3D Printers Basics</td>
<td>Intro to 3D Slicer Cleaning up Models</td>
<td>Portin, 2015* Patel, 2010* De Sousa, 2004*</td>
<td>Reading for next day discussion</td>
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<td>Day 4</td>
<td>Discussion: Art as Biology</td>
<td>Dissanayake, 1992: ch3* Pinker, 1997*</td>
<td>Dissanayake, 1992: ch 2 Davies, 2012</td>
<td>Reading for next day discussion</td>
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<td>Day 5</td>
<td>Discussion: Medical Applications and Evolutionary Aesthetics</td>
<td>Currie, 2014 (Introduction)</td>
<td>1-page summary of one of ^ articles Reading for day 6 discussion</td>
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<td>Day 6</td>
<td>Discussion: Aesthetics and Philosophy of Art</td>
<td>Jacobson, 2006^ Nanay, 2014^</td>
<td>Ultrasound Print Due CT Scan Print Due</td>
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<td>Day 7</td>
<td>Aesthetic Preference and the Brain</td>
<td>Lacey, 2011^ Stock, 2014 ^</td>
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<td>Day 8</td>
<td>Meaning and Vision</td>
<td>Tatler, 2008^</td>
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<td>Day 9</td>
<td>What does it all Mean?</td>
<td>Pinna &amp; Reeves, 2009^ Prinz, 2014^</td>
<td>Final Project Due 1-page summary of one of ^ articles</td>
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<td>Day 10</td>
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^ Changes are possible
**Required Articles and Films:**

Cave of Forgotten Dreams (Werner Herzog, 2009)


