Course and Contact Information

Instructors: Mohsen Marizad

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Office Hours: TUE & THU | 20:30 - 21:00

Class Day/Time: TUE & THU | 18:00 - 20:30

Classroom: IS 240

Course Description:

With the advent of digital tools and computational design, new possibilities are being explored in the application of complex geometries towards the future of product and fashion design. However, although new technologies have facilitated the digital design and fabrication of sophisticated double curvature geometries, the material translation, and functional application of these geometries in both disciplines of design and fashion is still largely unexplored. There is a need to understand the effects of material types on production processes and methods that result in these generated complex forms, in order to better realize the full spectrum of opportunities presented by these geometries in design. The central goal of our geometry-based approach is to utilize the methods of digital design and production tools and software in design and bridge these techniques with fashion. The term wearables considers these geometries as a platform between design and fashion. To put it differently, we are trying to consider fashion as a small scale space that can wrap around the human body.
**Studio Intent:**

Use minimal surface geometries and mesh relax as a generative framework to unify and direct design. The design intent is to work within a creative space that focuses on connection and how what we wear affects form and movement, and how we connect and interact with other inputs. Strategies in digital fabrication and construction of wearable minimal surface designs.

**Course Objectives:**

- Learning Rhino and Grasshopper as a major design software in the design industry
- Study scale, structure, construction techniques, spatial relationships of minimal surfaces and double curvature surfaces
- Understand the complexities of double curvature surfaces in digital modeling and fabrication
- Control of complex geometries to respond to specific design criteria
- Fabrication strategies of minimal surface and double curvature surface geometries, using 3d printers and laser cutters
- Explore the idea of how what we wear connects our bodies with itself, with others and with the broader environment.

**Studio Brief and Methodology:**

This course creates a unique opportunity to explore fabrication and construction techniques of double curvature structures at a more manageable human scale while incorporating an investigative element into a better understanding of the intersection of technology, design, material, and the human body. The design idea is to work within a creative space that focuses on how the human body interacts and connects with what we wear, with other people, and with the broader environment.
KnitCandela, ZHA and P. Block.

Cosmic Bubble by Vlad Tenu

Wearable Architecture. Studies on the left by UO Students Rachel Rimmer, Betty Lou Poston and Ryan Maruyama, and on the right by Ana Misenas and Alison Bartlett

Wearable Architecture. Studies by Shirin Hosseinzadeh and Behzad Jam
About the Instructor:

Mohsen Marizad is an award winning Iranian architect and design instructor. He has practiced and taught architectural design in the United States, Europe, Asia and the Middle East. Mohsen is interested in the reciprocal relationship of architecture, urban design and landscape. He is particularly focused on the understanding of morphology and its relation to performance, aesthetics and environmental integration. Mohsen was awarded the Architizer Jury Award in 2017 and 2018. Mohsen is currently a project designer at Gensler, and lives in San Jose, California.

Helpful Resources:


Links:

**KnitCandela**: The most advanced manifold surfaces in construction project in 2019: 
https://www.zaha-hadid.com/design/knitcandela/

**Ultra Thin Double Curvature Concrete Roof**: By ETH Zurich
https://www.youtube.com/watch?time_continue=31&v=Ki1EcBCurqc

**Confluence Park**: Matsys Design
https://www.archdaily.com/896460/confluence-park-lake-flato-architects

**Portable Car Charging Pavilion**: SynthesisDNA and Volvo
https://www.archdaily.com/449054/architects-and-volvo-collaborate-to-create-portable-car-charging-pavilion


**Nervous Jessica**: generative design studio that works at the intersection of science, art, and technology.
https://n-e-r-v-o-u-s.com/about_us.php
**Student Work:**

As the Wearable Sculptures design course is part of a broader research-based design effort on behalf of the instructors of the course, they retain the right to use content developed in this course for various publications, presentations, research, and further development. If students have any concerns or questions regarding intellectual property rights, please make an appointment to discuss them with your instructors. As with all similar efforts in the past, student contributions to this research will always be cited and documented to ensure fair use.

**Required Materials:**

You will need a laptop that is powerful enough and meets the minimum requirements to run the appropriate software for this class.

You have to provide the materials for your own projects based on your design and fabrication approach.

**SOFTWARE:**

- Rhino 6
- Grasshopper + Plugins
- Ultimaker Cura 4.4 or any other 3d printer software
- Photoshop / Adobe Illustrator / Indesign
- Quicktime

You may purchase academic version or download 90 days trial of Rhino 6 online at: [https://www.rhino3d.com/download/rhino-for-windows/6/evaluation](https://www.rhino3d.com/download/rhino-for-windows/6/evaluation)

You must bring your personal laptops at the first day of class we will instal and introduce **Rhino 6** as part of our first day class.

Photoshop and Illustrator are part of the Adobe Creative Suite and are available to SJSU students.

Quicktime is free and can be downloaded from the internet.

You will use these software applications for the rest of your academic career and newer versions and variations on them as you move into the profession. They are mandatory and no designer can expect to be gainfully employed without working knowledge of these tools today.
Students will also be responsible for purchasing material as required for assignments, materials may include: pens, pencils, paper, wood, cement, acrylic, adhesives, plastics, foam core, plaster, fastening hardware, aluminum, wax prints, cornstarch prints and other materials suitable for model making, high-quality paper for print outs, and professional printing services.

NOTE that University policy F69-24 at http://www.sjsu.edu/senate/docs/F69-24.pdf states that “Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to ensure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading.”

Requirements and Evaluation:

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at http://www.sjsu.edu/senate/docs/S12-3.pdf.

The course is organized around lecture and lab work: lectures will introduce topics and assignments and provide an overview of issues and outline the design principles and communication concepts that are expected to be investigated. Labs will be a period of focused exploration of design issues and communication skills. Finished projects and work in progress will be presented and discussed during each class session to make important points about design. Each pin-up will be graded. It is expected that your work will be printed out and pinned up within the first 15 minutes of class. If it is not you will receive a grade of 0 for that assignment.

Your final grade for this class will be based on class participation in reviews and labs and the successful completion of assignments. The assignment grade will be based on a set of criteria including the thoughtfulness and originality of the concept, rigorous and iterative experimentation, the application of the design principles you have learned, and the time and care you have invested in making models, final objects, renderings, and presentations.

Breakdown: 100%
Assignment 1: 30%
Assignment 2: 30%
Assignment 3: 30%
Participation: 10%

Class Participation will be based on preparedness for in class desk critiques and pin-ups and your role in contributing to the overall dialogue.
Grading Percentage Breakdown:

A = 100% to 95%
A minus = 95% to 91%
B plus = 91% to 87%
B = 87% to 85%
B minus = 85% to 81%
C plus = 81% to 77%
C = 77% to 75%
C minus = 75% to 71%
D plus = 71% to 67%
D = 67% to 65%
D minus = 65% to 61%
F = 61% to 0%

A- Excellent. Indicates work of a very high character; the highest grade is given. This grade is reserved for work that shows leadership and inspiration, demonstrating significant insight developed to its fullest extent and presented with exquisite craftsmanship.

B- Good. Indicates work that is definitely above average, though not of the highest quality. This work shows thorough exploration and development and is well presented with good craftsmanship, but it may not rise to the highest level of excellence.

C- Fair. Indicates work of average or medium character. Work in this category demonstrates complete fulfillment of the stated requirements and an understanding of the issues covered, but does not exceed the expectations of understanding, development, or execution.

D- Pass. Indicates work below average and unsatisfactory. The lowest passing grade. Though work may meet the minimum requirements, it lacks depth, development or is unsatisfactorily crafted.

F- Fail. Indicates work that the student knows so little of the subject that it must be repeated in order that credit may be received. Work in this category may be unfinished, unimaginative, underdeveloped or poorly executed, and shows minimal understanding of issues.

Classroom Protocol:

Teaching is a two-way dialogue. Attendance is expected at all class sessions and the student’s presence throughout the entire class time is required. Whenever possible, the professor should be notified in advance of a student’s inability to attend a class. In the event the professor is late for class, students are authorized to leave after a half hour wait. It is important to be on time and to be present. It is possible to produce “A” work in the class yet receive a lower grade due to poor class participation and attendance. Students must be present for in class critiques, students who arrive late will not be allowed to present.
If you miss a class, it is your responsibility to find out what you missed BEFORE the next class. Technical demos and lectures will not be repeated for students who miss a class; Projected critique dates will be given to you in advance; however, in some instances these may change due to extenuating circumstances, and it is your responsibility to find out about any announcements made in class, by communicating with your classmates.

Deadlines will be made available to you in class. Any work not turned in on the date it is due is considered late. Ten percent will be deducted from the grade for every class period it is not turned in. Special circumstances will be taken into consideration (e.g. Illness, court appearance, death of a relative.) All assignments must be completed and turned in to receive a passing grade for the class. The instructor reserves the right to alter assignments and change project due dates with sufficient notice to the students.

**University Policies:**

Dropping and Adding Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester’s Catalog Policies section at [http://info.sjsu.edu/static/catalog/policies.html](http://info.sjsu.edu/static/catalog/policies.html). Add/drop deadlines can be found on the current academic year calendars document on the Academic Calendars webpage at [http://www.sjsu.edu/provost/services/academic_calendars](http://www.sjsu.edu/provost/services/academic_calendars). The Late Drop Policy is available at [http://www.sjsu.edu/aars/policies/latedrops/policy/](http://www.sjsu.edu/aars/policies/latedrops/policy/). Students should be aware of the current deadlines and penalties for dropping classes. Information about the latest changes and news is available at the Advising Hub at [http://www.sjsu.edu/advising/](http://www.sjsu.edu/advising/).

**Consent for Recording of Class and Public Sharing of Instructor Material:**

University Policy S12-7, [http://www.sjsu.edu/senate/docs/S12-7.pdf](http://www.sjsu.edu/senate/docs/S12-7.pdf), requires students to obtain instructor’s permission to record the course:

- “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor’s permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”

- “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”
Academic integrity:

Your commitment, as a student, to learning, is evidenced by your enrollment at San Jose State University. The University Academic Integrity Policy S07-2 at http://www.sjsu.edu/senate/docs/S07-2.pdf requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at http://www.sjsu.edu/studentconduct.

Campus Policy in Compliance with the American Disabilities Act:

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at http://www.sjsu.edu/aec to establish a record of their disability.

Accommodation to Students' Religious Holidays:

San José State University shall provide accommodation on any graded class work or activities for students wishing to observe religious holidays when such observances require students to be absent from class. It is the responsibility of the student to inform the instructor, in writing, about such holidays before the add deadline at the start of each semester. If such holidays occur before the add deadline, the student must notify the instructor, in writing, at least three days before the date that he/she will be absent. It is the responsibility of the instructor to make every reasonable effort to honor the student request without penalty, and of the student to make up the work missed. See University Policy S14-7 at http://www.sjsu.edu/senate/docs/S14-7.pdf.
## COURSE SCHEDULE

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<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Class Schedule</th>
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<tr>
<td></td>
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<td><strong>Assignment 01: Small Scale 3D Printing / Rhino, Grasshopper Tutorial</strong></td>
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<tr>
<td>1</td>
<td>Jan 23</td>
<td>- Class introduction presentation</td>
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<td>- Rhino, Grasshopper tutorial</td>
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<td>- Precedent study introduction</td>
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<td>2</td>
<td>Jan 28</td>
<td>- Rhino, Grasshopper tutorial</td>
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<td>Jan 30</td>
<td>- Review individually design decisions</td>
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<td>3</td>
<td>Feb 04</td>
<td>- Research-based design</td>
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<td>Feb 06</td>
<td>- Review individually design decisions</td>
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<td>- Research-based design</td>
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<td>- Pin Up Review</td>
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<td>4</td>
<td>Feb 11</td>
<td>- Case study presentation</td>
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<td>Feb 13</td>
<td>- 3D Printing / Small Scale</td>
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<td>- Pin Up Review</td>
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<td>5</td>
<td>Feb 18</td>
<td>- 3D Printing / Small Scale</td>
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<td>Feb 20</td>
<td>- Photography / Graphic Presentation</td>
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<td>- Final Presentation</td>
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**Assignment 02: Medium Scale 3D Printing / Post processing, Half Class**

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<tr>
<th>Week</th>
<th>Date</th>
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<tbody>
<tr>
<td>6</td>
<td>Feb 25</td>
<td>- Rhino, Grasshopper tutorial</td>
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<tr>
<td></td>
<td>Feb 27</td>
<td>- Research-based design</td>
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<td>- Review individually design decisions</td>
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<td>7</td>
<td>Mar 03</td>
<td>- Research-based design</td>
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<td>Mar 05</td>
<td>- Review individually design decisions</td>
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<td>- Pin Up Review</td>
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<td>8</td>
<td>Mar 10</td>
<td>- 3D Printing / Medium Scale</td>
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<td></td>
<td>Mar 12</td>
<td>- 3D Printing / Medium Scale</td>
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<td>- Pin Up Review</td>
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| 9    | Mar 17 | - 3D Printing / Medium Scale  
       |       | - Review individually design decisions  
       | Mar 19 | - Post Production  
       |       | - Pin Up Review |
| 10   | Mar 24 | - Post Production  
       |       | - Photography / Graphic Presentation  
       | Mar 26 | - Final Presentation |
|      |        | **Assignment 02: Medium Scale 3D Printing / Post processing, Half Class**  
      |        | **Assignment 03: Large Scale laser Cutter Fabrication, Half Class** |
| 11   | Mar 31 | Spring Break  
       | Apr 02 | Spring Break |
| 12   | Apr 07 | - Rhino, Grasshopper tutorial  
       | Apr 09 | - Research-based design  
       |       | - Review individually design decisions |
| 13   | Apr 14 | - Research-based design  
       | Apr 16 | - Review individually design decisions  
       |       | - Pin Up Review |
| 14   | Apr 21 | - Laser cutting / Assembly  
       | Apr 23 | - Review individually design decisions  
       |       | - Laser cutting / Assembly  
       |       | - Review individually design decisions |
| 15   | Apr 28 | - Laser cutting / Assembly  
       | Apr 30 | - Pin Up Review  
       |       | - Presentation / Graphic / Photography  
       |       | - Review individually design decisions |
| 16   | May 05 | - Presentation / Graphic / Photography  
       |       | - Review individually design decisions |
|      | May 07 | - Final Presentation  
      |      | **FINAL Exam**  
      | May 07 | - Final Presentation |