Arch 3690
Intermediate Computation and Fabrication
Tue. 11:30 pm - 1:30 pm | Fri. 11:30pm - 1:30pm
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Prof. Charlie Able (*cable@citytech.cuny.edu*)

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ASSIGNMENT 01 GLUELESS PLEXI SPHERE - CONNECTION AND FORM

The challenge is to construct a sphere-like object that fits into a 12" x 12" x 12" cube and holds together without the use of glue or hardware, and thereby using only the detailing and material itself for structural stability. The material to be used is 1/8" plexiglass.

DUE: September 27th, 2013

Critical issues to remember:

1. Test the material as you develop design ideas, joints, and assembly techniques <u>BEFORE</u> you cut your final pieces
2. Possible starting points for research are <u>PLATONIC SOLIDS</u> and/or <u>ARCHIMEDEAN SOLIDS</u>. Look up these forms to help rationalize the complex geometry of a sphere (see Fig. 1 below).
3. How to design a detail that will allow assembly of flat material into a 3d dimensional structure?
4. Is the 'detail' repetitive while the 'structure' it holds together varying or is each detail unique?
5. Are the detail and structure one system or separate? In other words, are you creating one component that can attach to itself to create the sphere (structure and detail in one) or are you creating separate logic systems in several different components.
6. Look at the attached student projects as examples of previous solutions.
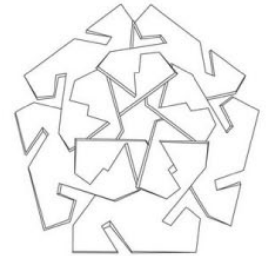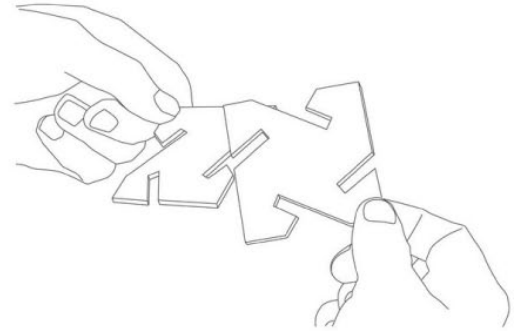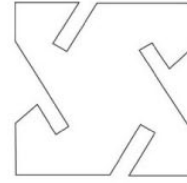
What you need to bring to the project review:

1. Final model (whether complete or not) with extra component pieces cut for us to play with.
2. One 11" x 17" page with drawings explaining your design and showing an assembly diagram.

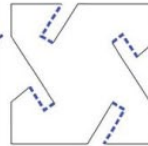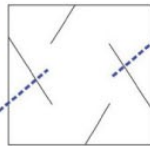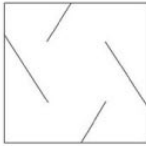Fig.1 - Rationalization of complex double-curved sphere.

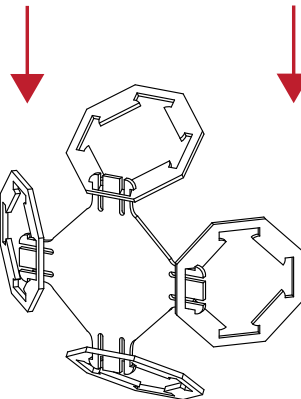NURBS Sphere   Waffle Grid   Dodecahedron   Geodesic Dome   Your Solution
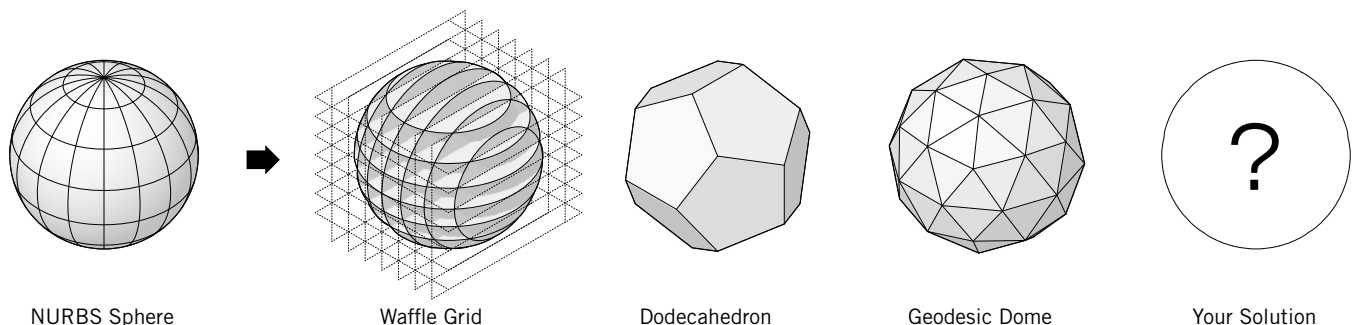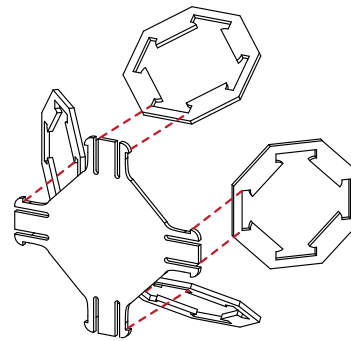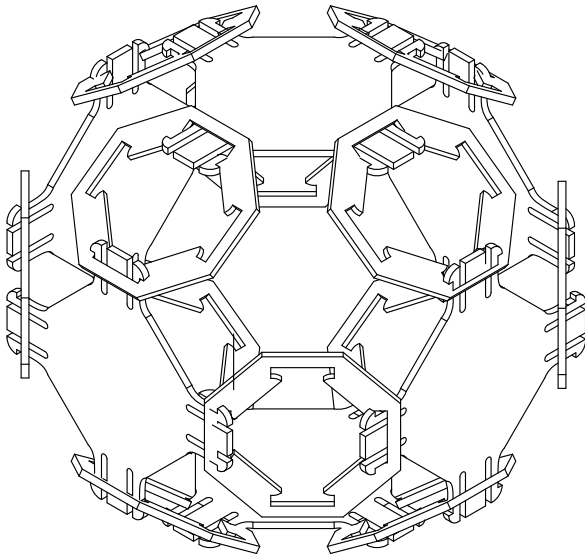
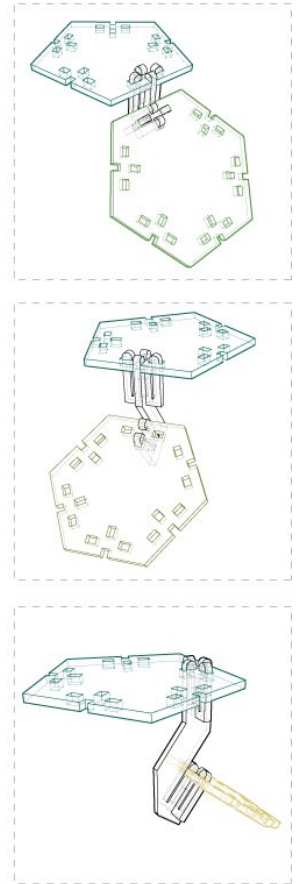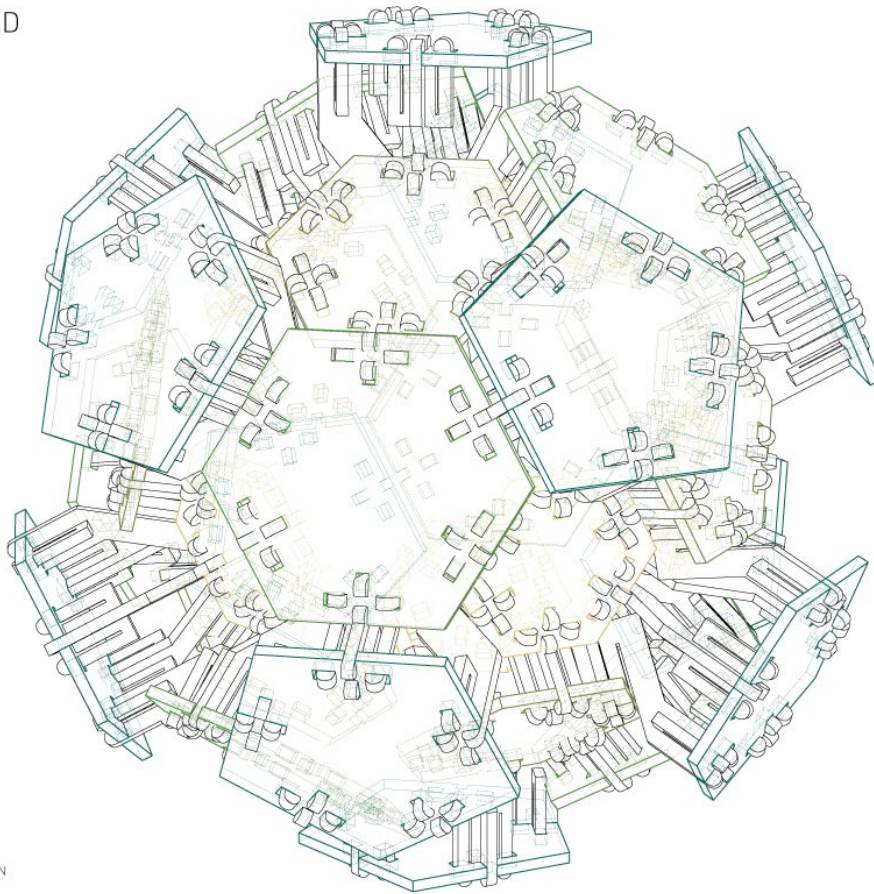## STUDENT PROJECT 01

kerri henderson kh2388 intro to fabrication 2008 09.15.08
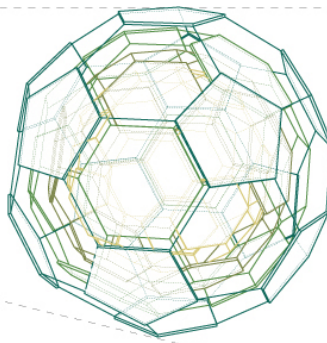
STUDENT PROJECT 02

GLUELESS SPHERE

Evgenia Melnikova
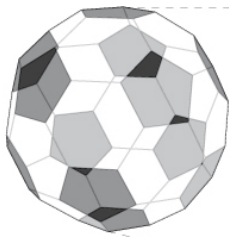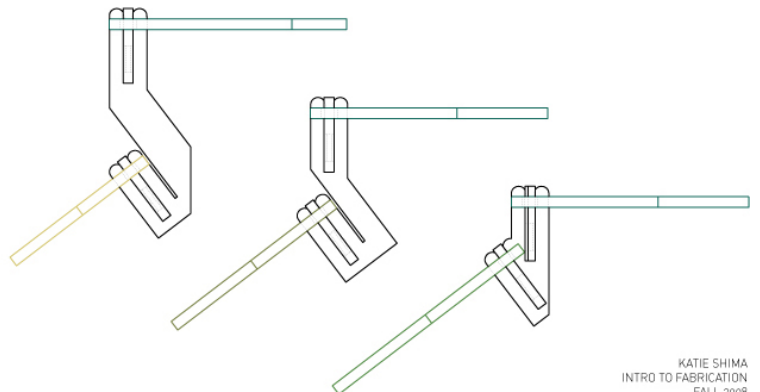Arch 3690 Spring 2013
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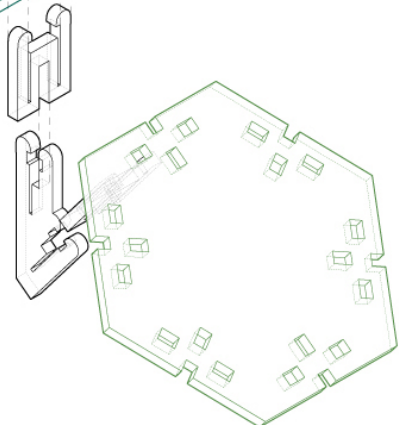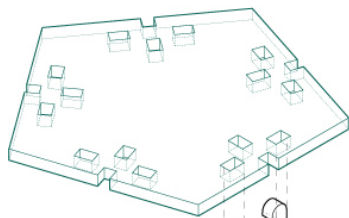
STUDENT PROJECT 03

EXPLODED
SOCCER
BALL

KATIE SHIMA
INTRO TO FABRICATION
FALL 2008
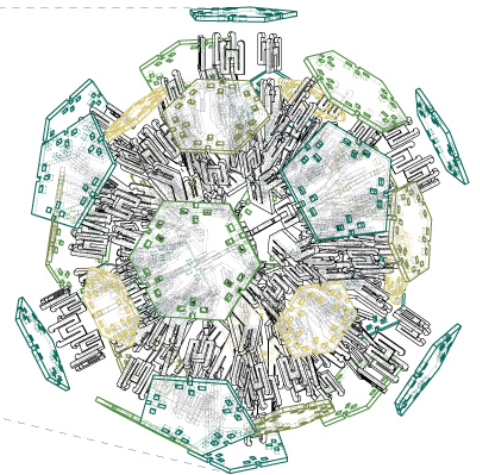
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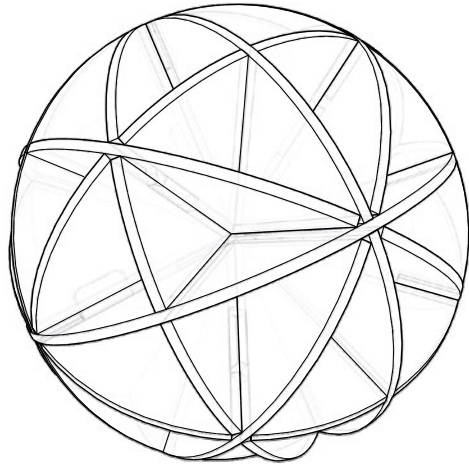SOCCER

BALL

KATIE SHIMA
INTRO TO FABRICATION
FALL 2008

STUDENT PROJECT 04

THE CUT SURFACES OF TABS ARE SANDED
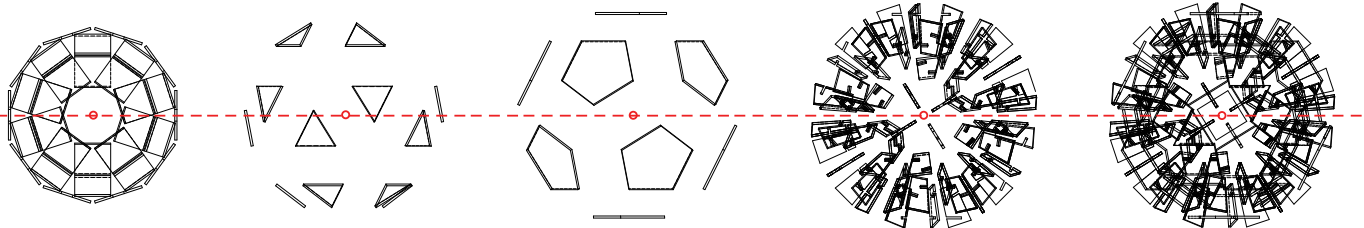TO GIVE THEM FRICTION TO HOLD THE
OTHER TABS

ASSIGNMENT 1B - PLEXI SPHERE
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SPRING 2013
MAYUMI TOMTIA
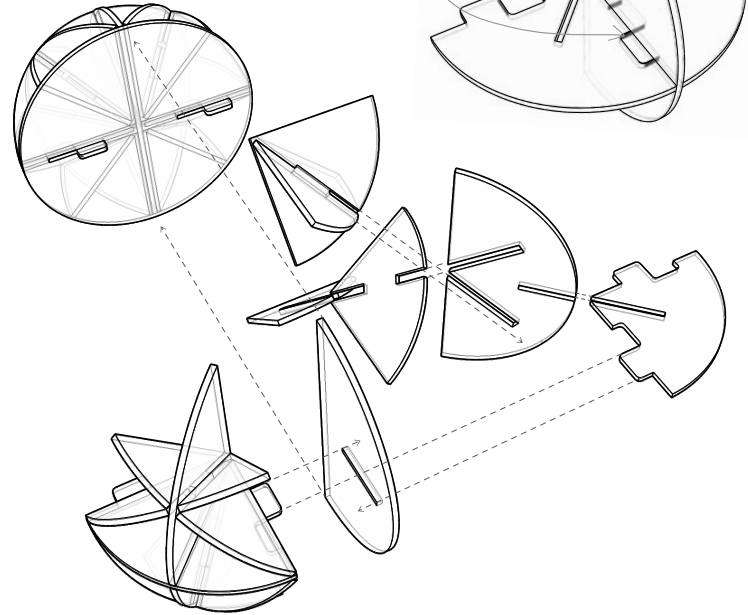
STUDENT PROJECT 05

Evolution

Sphere 1 [Square]
Radius:
Area:
Volume:
Pieces: 30 □

Sphere 2 [Triangle]
Radius:
Area:
Volume:
Pieces: 20 △

Sphere 3 [Pentagon]
Radius:
Area:
Volume:
Pieces: 12 ⬠

Sphere 4 [Ver. Connection]
Radius:
Area:
Volume:
Pieces: 60+60

Complete Sphere
Radius:
Area:
Volume:
Pieces: 172 □△⬠

STUDENT PROJECT 06

Load distribution