

**I. COURSE DESCRIPTION:**

Department Information  
Division: Humanities  
Department: Art  
Course ID: ART 270x4  
Course Title: Design in glass  
Units: 3  
Lecture 2  
Laboratory 3  
Prerequisite: None

**Catalog Description:**

A progressive study of glass-working techniques including designing and producing functional, decorative, and sculptural forms in kiln-fired glass; composition in two dimensions using fusion/lamination of colored glass elements; shallow relief slumping; three-dimensional relief using molds; and solid glass casting such as pate de verre, lost wax, and sand casting. This course may be taken four times

**Schedule Description:**

A progressive study of glass-working techniques, including designing and producing sculptural forms in kiln-fired glass; shallow relief slumping; three-dimensional relief using molds; and solid glass casting.

**II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: Four**

**III. EXPECTED OUTCOMES FOR STUDENTS:**

Upon completion of the course, the student should be able to:

- A. Distinguish and compare glass art from various cultures and regions by gaining knowledge about the visual concerns of those cultures.
- B. Evaluate a glass work from the creator's point of view by examining the creator's successful completion of his/her intent.
- C. Explain the impact and emotional message conveyed by basic visual elements such as color, line, point, mass, proportion, rhythm, positive/negative space, and shading.
- D. Demonstrate the ability to modify standard heating and cooling schedules based on analysis of previous firings. Elements considered include: glass type, overall size, complexity, and thickness.
- E. Identify technical problems that occur in early projects.
- F. Modify choice of materials with regard to compatibility and devitrification.
- G. Distinguish between compatibility and process (heating and cooling) problems.
- H. Demonstrate proficiency in manipulation of sheet glass using various tools including glass cutter, diamond saw, glass router/grinder, diamond drills, miscellaneous grinding/polishing machines, and sandblaster.

**Upon completion of the first semester, students should be able to:**

- A. Make simple accurate cuts in sheet glass
- B. Modify inaccurate cuts using miscellaneous grinding equipment
- C. Successfully prep kiln shelves
- D. Clean glass
- E. Load project into kiln
- F. Determine an appropriate firing schedule
- G. Program the schedule into the kiln computer
- H. Fire kiln

- I. Design and complete simple projects using
  - 1. copper foil
  - 2. lead came
  - 3. solder
  - 4. soldering iron
  - 5. grout
- J. Understand the difference between float glass System 96 and Bullseye 90.
- K. Understand the steps in bead-making
  - 1. prepare bead mandrel
  - 2. heat treat the prep
  - 3. produce simple beads
  - 4. successfully slow cool beads
- L. Complete successful presentation of multiple beads

**Upon completion of the second semester, students should be able to:**

- A. Make complex cuts accurately in sheet glass
- B. Design and produce projects with increasing regard to related elements
  - 1. color
  - 2. shape
  - 3. increasing/decreasing forms
- C. Design and complete increasingly complex soldering projects utilizing
  - 1. copper foil
  - 2. lead came
  - 3. copper wire
  - 4. brass tube
  - 5. solid brass rod
- D. Understand and explain visual elements that produce a "set" and apply these elements to make out of sheet glass
  - 1. a set of bowls, or
  - 2. a set of plates
- E. Make increasingly complex beads

**Upon completion of the third semester, students should be able to:**

- A. Design and create an electrical light fixture. Resolve problems relating to
  - 1. mounting
  - 2. wiring
- B. Successfully modify firing process from previous firings to produce larger and more complex works
- C. Begin to create a sketchbook / visual journal

**Upon completion of the fourth semester, students should be able to:**

- A. Design and complete a collaboration piece with another glass student. Piece is to be kiln fired.
- B. Produce a pulled cane mirrini
- C. Use mirrini in a fused piece or bead
- D. Continue working on sketchbook/visual journal

**IV. CONTENT:**

- A. Explanation and discussion of various types of glass
  - 1. compatibility
  - 2. different forms
    - a. sheet
    - b. rod
    - c. stringer
    - d. frit

- e. powder
- 3. Different compatible materials
  - a. organic
  - b. copper wire and foil
  - c. mica
- B. Basic preparation and heat treatment
  - 1. Kiln shelves
    - a. cleaning
    - b. preparation materials and process
    - c. fiber shelf paper
    - d. safety concerns
  - 2. Heat treatment (firing)
    - a. Heat up concerns
    - b. Process
      - i) tack fuse
      - ii) slump
      - iii) relief
      - iv) flat fuse
    - c. Cool down
    - d. Annealing
- C. Kiln control
  - 1. Safety concerns – safety test
  - 2. Controls and gauges
    - a. pyrometers
    - b. stepless controls
    - c. digitry controller
- D. Glass manipulation
  - 1. Cleaning
  - 2. Glass cutter basics
  - 3. Diamond saw
  - 4. Diamond router
  - 5. Hand tools
    - a. running pliers
    - b. grozing pliers
    - c. circle cutter
    - d. strip cutter
- E. Discussion of composition elements
  - 1. Color
  - 2. Line
  - 3. Point
  - 4. Mass
  - 5. Proportion
  - 6. Rhythm
  - 7. Positive/negative space
  - 8. Shading
- F. Identification and analization of technical problems
  - 1. Incompatibility
  - 2. Devitrification
    - a. safety concerns
    - b. over glaze solution
    - c. spray equipment application
  - 3. Heat up failure
  - 4. Uprisings
  - 5. Annealing
- G. Finish
  - 1. Rough grinding

- a. lapping wheel
- b. belt sander
- 2. Finish grinding
  - a. fine belt sander
  - b. diamond router
  - c. cork belts
- H. Presentation
  - 1. Soldering
    - a. safety concerns
    - b. lead came
    - c. copper foil
    - d. grout
    - e. patina
  - 2. Adhesives
  - 3. Framing
  - 4. Hanging
- I. Bead making basics
  - 1. Historical and ethnic overview
  - 2. Contemporary equipment
    - a. safety concerns
    - b. Gibberson bead furnace
    - c. Hot head torch
    - d. Bead mandrels
    - e. Bead release
  - 3. Forming process
  - 4. Cooling process
  - 5. Annealing
- J. Advanced beads – decorative techniques
  - 1. Threading
  - 2. Feathering
  - 3. Pick ups
  - 4. Mirrini
  - 5. Sculptural
  - 6. Vessels
- K. Bead presentation
  - 1. Composition
  - 2. Findings

**V. METHODS OF INSTRUCTION:**

- A. Lectures
- B. Discussions
- C. Instructor demonstrations
- D. Guest artist demonstrations
- E. Audio visual presentation
- F. Visitation of galleries and museums
- G. Hands-on practice

**VI. TYPICAL ASSIGNMENTS:**

- A. Glass box with fused or slumped front piece. Project goals:
  - 1. Decide on box layout and design and fire front piece
    - a. fuse
    - b. slump
    - c. document firing procedure
    - d. refine raw edges of front piece
      - 1. grinding
      - 2. polishing

2. Determine box layout and accurately cut and grind all pieces to fit together
3. Produce solder joints structurally sound
4. Use lead came or foil to construct box
- B. Window piece with fused or slumped center piece. Project goals:
  1. Successfully design and fire center piece
    - a. document firing
    - b. refine edges
    - c. produce a "cartoon" of finished window piece
  2. Design composition to enhance center piece
  3. Accurately cut and grind pieces to fit together, leaving allowances for lead or copper foil
    - a. assemble lead came or
    - b. copper foil
  4. Produce solder joints structurally sound
    - a. grout
    - b. attach hanging hardware
- C. Bowl/plate set, fused then slumped into molds. Project goals:
  1. Determine finished bowl size
    - a. Choose a mold
    - b. Accurately size glass to fit mold
  2. Use composition elements to create a visually dynamic piece
  3. Produce composition over base piece
  4. Heat treat (fire)
    - a. consult standard firing schedules
    - b. adjust to match size and thickness of piece
    - c. process to desired finish
    - d. cool and anneal
    - e. document firing
    - f. refine edges on finished piece
  5. Refine firing and finishing skills
  6. Understand slump mold preparation
  7. Prep mold for slump process
  8. Heat treat
  9. Finish base
- D. Slump over stainless steel mold. Project goals:
  1. Understand metal mold prep
  2. Demonstrate proficiency with spray gun and understand safety concerns
  3. Adjust and refine firing skills
  4. Select mold and size glass to accurately fit
  5. Prepare mold
    - a. prepare wash
    - b. heat mold
    - c. spray coat while hot
  6. Place in kiln
  7. Heat treat
  8. Document firing
  9. Grind when cool
- E. Produce time/temperature graph from firing log. Project goals:
  1. Select firing to be graphed and produce graphic evidence of various kiln manipulations
  2. Translate times/temp to time/temp chart and analyze chart to recognize settings that produce slower/faster than ideal progress
  3. Connect moment to create graph
- F. Bead Bracelet or Necklace. Project goals:
  1. Introduction to hot head torch and Gibberson Bead Furnace
  2. Understand mandrel/release/glass cane basics, including:

- a. mandrel assessment and prep
  - b. bead release consistency - critical
  - c. timing regarding mandrel heat vs. can heat
  - d. glass came production
  - e. production of mandrel-wound bead
  - f. motor skills necessary to produce controlled result
  - g. visual clues regarding the cooling process
- G. Necklace with fused cabazon. Project goals:
1. Combine skills and composition values from both bead-making and fusing areas to produce a successful piece
    - a. consider potential design and color combinations that work in bead apparatus and kiln
    - b. produce successful cabazon with particular attention to inclusion in necklace, i.e., stringing channel or loops
    - c. produce beads to complement cabazon
    - d. finish and display
- H. Field Trip: Select one piece of glass art from among those observed at the museum we visited. Prepare a three-page paper that describes the object's emotional message by addressing color, line, point, mass, proportion, rhythm, positive/negative space, and shading. Describe what prompted you to select this glass art.

## VII. EVALUATION:

- A. Methods of Evaluation
1. Objective and subjective examinations (for lecture and text assignments).  
Typical questions include:
    - a. All of the following are controls on the kiln **except:**
      - i) pyrometers
      - ii) stepless controls
      - iii) rotary controller
      - iv) digitry controller
    - b. Compare glass art from two different cultures (your choice)
    - c. Discuss the technical problems that can occur in early projects.
  2. Subjective evaluation of student writing (field trip reports, term paper):  
Students are graded on their ability to apply course material to the analysis of a work of art, to organize the material in a coherent fashion, cite sources, and write clearly.
  3. Subjective evaluation of student glass work. Grading will be based on the quantity of quality work produced. Quality will be assessed with regard to
    - a. Design
    - b. Craftsmanship
    - c. Aesthetics
    - d. Notebook/sketchbook
- B. Frequency of Evaluation:
1. Successful completion of at least 7 glass projects
  2. One final examination
  3. One written analysis

In general, students are evaluated on their ability to demonstrate course concepts in their glass art. Additional specifics by semester include:

**Upon completion of first semester, students will be evaluated based on their:**

- A. Ability to understand the use of various forms of glass:
1. sheet glass
  2. glass rod
  3. stringers
  4. frit

5. powders
- B. Ability to demonstrate safety procedures while manipulating glass when using the
  1. glass cutter
  2. diamond saw
  3. diamond router
  4. hand tools
    - a) running pliers
    - b) grozing pliers
    - c) circle cutter
    - d) strip cutter
- C. Acquired knowledge of the kiln firing process
  1. safety concerns
  2. controls and gauges
    - a) pyrometer
    - b) stepless controls
    - c) digitry controller
  3. kiln and glass prep
- D. Gained hand-eye coordination during the use of
  1. copper foil
  2. lead came
  3. solder and soldering iron
  4. grout
- E. Presentation of completed assignments

**Upon completion of second semester, students will be evaluated based on their:**

- A. Grasp and execution of the use of compositional elements
  1. color and line
  2. mass and proportion
  3. positive/negative space
  4. shading
  5. rhythm
- B. Ability to identify and analyze technical problems
  1. incompatibility
  2. devitrification
  3. heat-up failure
  4. uprisings
  5. annealing
- C. Presentation of completed assignments

**Upon completion of third semester, students will be evaluated based on their:**

- A. Finishing skills used to produce more complex projects, such as light fixtures
  1. rough grinding
    - a) lapping wheel
    - b) belt sander
  2. finish grinding
    - a) fine belt sander
    - b) diamond router
    - c) cork belts
  3. soldering
  4. attention to design factors and functionality
- B. Entries in their sketchbook/visual journals

**Upon completion of fourth semester, students will be evaluated based on their:**

- A. Collaboration with another glass student and successful production of a work or works complex in structure, implementing compositional strategies in an aesthetically valid creation(s)

**VI. TYPICAL TEXT(S):**

- A. Jenkins, Cindy. Making Glass Beads 2<sup>nd</sup> ed.. Lark Books, 2001
- B. Sherr-Dubin, Lois. The History of Beads (concise) 2<sup>nd</sup> ed.. Abradale Press, 2001
- C. Lundstrum, Boyce; Schwoerer, Daniel; Lundsrom, Kathleen. Kiln firing glass: Glass Fusing Book #1. Vitreous Group Publications, 1994
- D. Lundstrum, Boyce. Advanced Fusing Techniques: Glass Fusing Book #2 (2<sup>nd</sup> edition). Vitreous Group Publications, 1991.

**IX. OTHER SUPPLIES REQUIRED OF STUDENTS:**

- A. Students are required to pay a \$25 lab donation which supplies them with the glass they will need to complete their assignments
- B. Glass cutter, approximately \$20