Parking
Parking is available directly outside of our courtyard gate and on Lot #2, East of our building. You can view a directional map here: https://drive.google.com/open?id=0BwwE7dz1wLJUOV93dGkweGhfSUk

On the first day of class, enter through the courtyard and then use the double doors on the right. This entrance is marked with a STAR on the map. We offer key card building access for all students. We will be programming one of your existing cards at your first class, please bring one with a magnetic strip on the back.

Instructors
Instructors will be introduced at the first class.

You may direct inquiries and notices to your instructor or directly to create@stlglass.com.

Grades
Grading will be based on attendance, level of engagement and completion of projects

Attendance
- Three unexcused absences may result in a failing grade
- Automatically excused absences are documented medical or family emergencies.
- Documentation should be provided no later than 7 days following the absence.

Timeliness
- Classes begin on time.
- Arriving more than 10 minutes after the start of class may be counted as an absence.

Class Times
Some portion of each class will be devoted to lecture/demos. The remainder of the class will be independent studio time.

What to Bring
Something to drink/water bottle
Notebook and Pencil

What to Wear
Natural Fibers are better than synthetics
Safety Glasses – Studio will provide.
NO GLOVES - NO OPEN TOED SHOES - NO LOOSE ITEMS (including long hair, tie back or you may lose it). If you do not follow these rules we reserve the right to send you home to get the appropriate attire.

Recycling and Trash
Be conscious of your standard items aluminum, plastic and glass bottles.
We also reuse as much scrap glass and other supplies as is feasible.
Please clean up after yourself, specifically if you bring food and beverages into the studios.

Cell Phones
DO NOT use cell phones during class. The instructors and your classmates expect your attention and respect.
Safety
Liability Waiver. You are required to sign two waivers, one from Third Degree and one from Washington University. All students should know the risks of working with glass. We attempt to run a safe shop, but cannot protect you from everything.

Moving in the Studios
At any time up to half a dozen people are moving around the studio holding sheets of very sharp glass, or 2000 degree glass and metal objects. To avoid cutting or burning yourself or each other, we suggest that you move slowly and let a person who is holding glass know that you are passing them. Addressing people by name with specifics is helpful e.g. “Casey I’m right behind you.”

Drugs and Alcohol Policy
Do not come to class if you have been drinking or have consumed anything else that would impair your coordination, judgment or balance.

Burns & Cuts
Most students will receive minor burns and cuts as a natural part of learning to work with glass. Report all burns and cuts to a staff member immediately. Time is of the essence with burns. Always place the burn under cool running water as the first step. Often the pain is not as severe initially, then suddenly it can become uncomfortable. Stop working even if you think it is minor, head to the sink in the Flame studio and proceed with running cool water over the affected area while waiting for assistance from your instructor.

Un-annealed Glass
Shards and other pieces of un-annealed glass in and of the studios can be extremely dangerous and may explode without warning. Under no circumstances should ANY piece of glass be removed from the studio unless it has been annealed.

Glass Drops, pops, etc.
Hot Glass - Molten glass that falls on the floor needs to be moved immediately. Gently “kicking the blob” is acceptable. Attempt to move it only a foot or two and ask for the assistance of your instructor. In all studios glass may break and pop, flying across the studio making it imperative that safety glasses are worn in all studios at all times.

Hot and Sharp
Assume that all surfaces are hot or sharp. Always approach with caution if you are uncertain. Specific guidelines will be shared in each studio.

How to Get Kicked Out
With over a dozen people working simultaneously, we must control the behavior of the students for the safety and enjoyment of all. We will warn you once, at the second instance of unsafe behavior you will be asked to leave.

Reckless Behavior
Disregarding the safety of the other students or the fragility of the equipment is grounds for immediate dismissal. If you do not know how to operate a piece of equipment, ask.

Outbursts of Anger
Working with glass can be frustrating, but please restrain from angry outbursts or vitriolic tirades. NEVER throw or slam an object in the studio.
FUSED GLASS - 5 Week Session

**Week 1 - Intro - Edge Construction and Thick Block**

**Safety Talk** - Mental and physical preparation, Clothing, Kiln Equipment and Tools, Safety Glasses, Unannealed Glass

**Equipment and Tool Overview** - Kilns, Cutters, Running Pliers, Grozing Pliers, Mats, Rulers & Squares, Storage Space, Vacuum, Clean up

**Edge Construction Project**
Cutting Glass, Thinfire Paper, Arranging your glass, Clean and Loading Kilns

**Thick Block Project**
With this project you will be asked to create an image within a block of glass. You will be given one square foot of glass to cut into six, 4” x 6” pieces of glass. Through a stencilling technique an image will be painted onto multiple layers of glass to create an image that has depth.

**Prep For Week 2** - Bring to class some images that you are inspired by, or you can use as a starting point for your design. Images should be copied or print in black and white and be sized appropriately for your ideas. Bring in at least five images.

**Week 2 - Edge Construction and Thick Block cont.**

**Edge Construction Project**
Cleaning your glass and Loading Kilns

**Thick Block Project**
Glass Cutting, Contact Paper, Paint

**Week 3 - Fused Mosaic Intro, Edge and Thick cont.**

**Edge Construction Project**
Slumping

**Thick Block Project**
Finish painting and powder. Then load in kiln for pre-fire.

**Fused Mosaic**
Introduction

**Week 4 - Stringer Drawing, Mosaic, Thick Block**

**Thick Block**
Clean and stack for final firing.

**Mosaic**
Glass Cutting, GlasTac

**Stringer Drawing**
Introduction

**Week 5 - Stringer Drawing, Mosaic**

**Mosaic**
Powder in-fill

**Stringer Drawing**
Vitrograph Kiln
Design and Load
FLAMEWORKING - 5 Week Session

**Week 1 - Intro - Torches, Kilns, and Tools**

*Safety Talk*
Mental and physical preparation, clothing
Torches and Kilns
Safety Glasses
Unannealed Glass

*Equipment and Tool Overview*
Mandrels / Tool Boxes - Put all tools back!
Box Inventory: Eye Glasses, water cup, scissors, knife, striker, graphite marver, rod rest, mandrel holder,
Tungsten pick, mini-masher, grooved pad, greedy grabbers and tweezers (13 total)
Glass Rods / Torches
Clean up

*Torch Time - Basic Shapes*
Round, Square, Triangle, Disk, Drop-Flatten-Twist
Stringers and Dot Beads
Cylinder Beads and Grooved Marver
Make your own frit / Frit Bead / Encasing your frit bead

**Week 2 - Technique demos and torch time**
Two color bead and twist
Three dots and twist in middle
Rope twist
Stacked dots and twist in-between
Groovy flower
Encased flower with bubble

**Week 3 - Technique demos and torch time**
Stringers on a cylinder bead
Raked and pressed
Rainbow stringers shifted
Making a striped bead
Making a triangle
Masking

**Week 4 - Technique demos and torch time**
Two color twistys
Three color twistys
Applying twistys on Bi-cone
Tiger Bead
Graduated color twisty
Graduated color on barrel
Foils

**Week 5 - Technique demos and torch time**
Hearts / Fish / Flowers / Leaf / Bumble Bee
HOT GLASS - 5 Week Session

**Week 1 - Hot Shop Orientation**

*Safety Talk*
Mental and physical preparation, clothing
Hot Equipment and Tools
Safety Glasses
Unannealed Glass
Hydration
Textbooks

*Equipment Overview*
Pipe Warmer, Furnace, Garage, Pick-up ovens, Marver, Glory Hole, Yoke, Bench, Break off table, Gas torch, Annealers, Pipe Bubbler
How to use the Yoke and Glory Hole
How to sit at the Bench, Cold movement drills - furnace to bench and back again

*Bench and Hand Tool Description and Usage*
Blowpipe & Punties, Pipe Cooler
Jacks, Tweezers, Straight & Diamond Shears, Wood blocks
Paper, Parchofi
Cold pipe rolling drill

*Gathering Exercises*
Cold gathering drill - Bucket practice
Blocking or shielding, working the door
Practice Gathering - 1st Gather Drills: Least Amount; Normal Gather (marver a cylinder)
Marvering - Drill: Gather, Marver, Marble
Punty Making

**Week 2 - Solid Glass and Starter Bubbles**

*Gathering (about 1hr-45mins)*
Marver and punty practice: Punty and One Gather drills
Turning and practice moving between bench and hole with hot glass: Two Gather Drill
Solid Glass exercises: Caterpillar drill, Tweezer drill, Clear paperweight drill
Transferring / “puntying”: Pass the Ball drill

*Gathering with a Blowpipe (about 1hr-45mins)*
Marvering for Blowing
Starting a bubble
Reheating
Blowing a ball and Necking
HOT GLASS - 5 Week Session - Cont.

Week 3 - Basic Blowing

Being good assistants
Anticipation
Paying attention
First assistant - turning, bench blowing, and taking heats
Second Assistant - organizing tool bench, block set up, shielding, paddling
Serving bits

Gathering second and third gathers (1st Hour)
Caterpillar Sculpture drill

Blowing Vessels (2nd + 3rd Hour)
Vessel Demonstration: demo the blowing process, make a cylinder cup
Sphere, then Cylinder in the work process
Flattening bottoms
Transferring and opening

Week 4 - Variations on Cylinder and Sphere

Amphora shape - vessels with necks
Work process for tall, closed shapes
Using wet paper for shaping
Vases with tapered bodies
Various tops - necks, trumpets, drawn neck

Week 5 - Bit Work

Hemispherical Bowls
Work process for low, open shapes
Use of Pachioffis and wet newspaper
Turning to open - three ways to shape

ADDITIONAL HOT GLASS INFO:

Sharing Blowpipes
The Gaffer and assistants will take turns blowing on the pipe during the course of a piece. If you are uncomfortable with this communal contact, the best remedy is to purchase your own blowpipe and use a blow-hose.

We will provide alcohol wipes and swabs so that you can clean the mouthpieces prior to use. If you are sick or think you might be sick inform your instructor prior to class and they will provide you with your own designated blow pipe for the day.

Moving in the Studio
At any time up to half a dozen people are moving around the studio holding 2000 Degree objects. To avoid branding each other and having to reread the liability waiver, we suggest that you move slowly and let a person who is holding glass know that you are passing them (especially from behind). Many people place a hand on the back of a person when walking behind them. ANYONE UNCOMFORTABLE WITH BEING TOUCHED IN THIS MATTER SHOULD LET THE STAFF KNOW. Addressing a person by name is very helpful (e.g. "Casey, I'm right behind you.")
EQUIPMENT

Furnace
The furnaces hold 300 lbs of glass at 2000 F. It runs continuously and is very fragile. Students need to receive special instruction before removing glass from the furnace. Take care not to run into the door or door opening with hot glass.

Glory Hole
Glory holes are used to reheat glass and run at a temperature of 2150 F. The doors are fragile and should be operated only with the appropriate tools (never the hand, foot or blowpipe).

When you accidentally drop a piece in the glory hole, use the pipe or punty that it fell off to immediately retrieve as much of the piece as you can. Pay particular attention to avoiding collisions with the doors.

Bench
The main work area, the bench combines two areas: a seat with rails and a tool stand. Sit towards the RIGHT of the bench – that's where the glass is!

Annealers
Annealing ovens are used to safely cool glass from final temperature (960 F) to room temperature. Our annealers are computer controlled and programmed to accept pieces up to 1" (one INCH) thick. Thicker pieces will require special programming and should not be made without the consent of a staff member.

Pipe/Color Warmers
Glass will not stick to cold objects. We therefore preheat our pipes and puntrys in a small oven. A pipe is hot enough when it has a very slight glow (actually, even pipes that don't glow may be hot enough, but it's harder to tell). Do not use a pipe that has not been heated as bits of glass on the end may explode violently when rapidly heated. We recommend cleaning the mouthpiece before using the blowpipe with provided alcohol wipes.

Handtools
Jacks, Shears and other hand tools are provided by the studio. NEVER use shears on cold glass.

Blowpipes
Blowpipes cost $150 each and are provided for student use. Shop pipes should be treated gently, especially when hot. They should NEVER be heated beyond a dull glow. A red hot pipe is a big no-no.

Pipe Etiquette
Our pipes have plastic mouthpieces rather than the traditional metal. The plastic pieces are more delicate and scratch easily especially when spun on the floor. Please take care not to scratch the plastic on the floor or other surfaces.

Pipe Bubbler
After using a blowpipe we place them in the bubbler. The bubbler is a bucket of water and a hose that continuously forces air through the blowpipe, preventing water and steam from traveling up the interior of the pipe. Never place a pipe in water without capping the end. If you forget to do this, a column of ultra-hot steam will surge up the pipe and remind you. Simply place the air hose on the pipe and put it in the water.

"The Slide"
You cannot tell how hot a pipe is by sight, so assume it is hot. Grab a pipe towards the handle and slowly slide your hand down towards the head. You will almost never slide into a burn, burns are caused by grabbing.

**Marver**
The marver is the most powerful method of shaping glass and also the most difficult to master. When marvering glass, remember to support the weight of the piece and only allow the area you are working to touch the surface. The marver is an excellent tool for removing heat from an area of the glass. Marvers must be clean. Never set any object (especially a wet object) on a marver. It is a good habit to wipe the marver down before each use.

**Block**
Wooden spoon-like “blocks” are used only to shape very hot glass (usually out of the tank). Blocks should not be used on glass that is not moving as they will simply scum the surface and damage the block. Blocks should be used wet, but not with pools of water. Rewetting the blocks several times per reheat is essential.

**Jacks**
The main tool for shaping glass has two working surfaces, the blades and the flat back side (hinge). Assume both are hot and only grab the jacks by the handles. Never stick the jacks in water. Jacks should have a fine coating of wax on the working surface.

**Paper**
About 5 sheets of wet newspaper will protect you from the glass even straight out of the furnace. Newspaper should be treated like blocks and always used WET on MOVING glass. We use newspaper without colored inks (for safety) and prefer the Wall Street Journal (better paper quality). Please don't leave paper pads laying everywhere and be sure to clean up the mess they leave behind.

**Refractory is Fragile**
Materials that can take 2000 Degrees are fragile. Don’t slam anything. If a door is stuck, call a staff member.

**Bending Pipes**
Pipes are meant to be straight, and they will stay this way until dropped, overheated, or whacked. Try not to do any of these things.

**TECHNIQUE**

**Teamwork**
In the hotshop, you will work in teams of three. The person making the piece is in charge of the team and is known as the Gaffer. The two assistants help the Gaffer by getting pieces of glass, arranging tools, providing bench blows, etc. Gaffers will not always need 2 assistants, allowing time for one assistant to rest. Team members should take care of each other. Assure that your fellow students follow the rules of safe behavior and do not work beyond their abilities.

**Blowing**
Despite its name, there is actually very little blowing involved in glassblowing. Most of what we do is balance and temperature control. However, there are several methods for getting air into glass.

**Normal**
Lips on the pipe and blow? Not so fast! Beginners who tend to work the glass cold will pass out blowing through their lungs. Blow from your cheeks. Look up Dizzy Gillespie if you have any questions.

**Bench Blow**
Just like a normal blow, except it's done by the assistant while the gaffer works the piece. The hard part of giving a bench blow is keeping your lips on the pipe while the gaffer rolls it back and forth. Putting your hand gently on the pipe, without interfering with the rolling, can help this, and also protect your teeth. The gaffer should take great care not to jerk the pipe toward the assistant! The assistant should start by blowing gently.
**Capping**
Capping involves putting a quick puff of air into the pipe and then immediately capping the end with your thumb. The trapped air pressure will blow the piece out for you. This can be difficult to do as a beginner and waste valuable time. Ask your assistants to observe while you blow until you have mastered starting the bubble.

**End of Class Clean-up**
As the end of your lab section nears you can begin cleaning your work area. Your instructors are there to teach you, not clean up your mess. Unless instructed otherwise, all tools should be returned to the tool closet, blocks returned to the buckets and all workspaces should be vacuumed clean. Vacuuming with our HEPA filtered vacuum eliminates any hazards that might develop from inhalation of glass dust. Avoid vacuuming water!

**Hot Good / Cold Bad**
Work the glass hot. Work it hot. Hot = Good. Cold = Bad. Work hotter than you feel you can control and you will learn how to control the glass. Work cold and you will make horrible scraping sounds that only annoy your partners and make the studio tense. When in doubt, get it hotter. Repeat 20 times "HOT GOOD, COLD BAD"

**EXERCISES**
These exercises are designed to teach you the basic elements of glassblowing in such a way that you can concentrate on a single skill before adding the next skill. The exercises also have a specific order to them. The order is important. We begin with safety and basic pipe handling skills. Once these have been mastered, we move to solid body (no bubble) work. Next we add the element of a bubble. Finally, we teach you how to put them all together and make a cylinder.

**Gathering**
We purposefully do not teach gathering at the beginning of the class for several reasons. First, most students are intimidated by the heat and noise of the furnace and are likely to forget to turn the pipe unless constantly reminded (in which case they aren't concentrating on the gather). Secondly, the gathering process is taught in teams initially and we want to wait until students have some comfort with their teams. Thirdly, we want you learning the other skills on relatively symmetrical gathers (your first gathers won't be this way). Finally, the furnace is extremely fragile and must never be hit with a gather of glass, so we don't want newbies gluing the door shut with a bad gather.

**Safety Exercises**
Although the exercises in this section are generally pipe handling exercises, we place them under the heading of safety because most students burn themselves with the pipe and other tools – not the glass itself. For this reason, these exercises are done cold – without any glass or heat.

**Error Correction**
The last point bears repeating. Glassblowing is error correction. It's not what you know how to make, it's what you know how to fix. Never give up.