4 WEEK
Beginning
Stained Glass
Class

The Vinery Stained Glass Studio
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Welcome!

We hope you enjoy the next four weeks, meet new friends, and learn lots! We just have a couple of things to tell you about our class before you dive into the glass.

This class will provide you with the fundamentals of stained glass using the copper foil method. Patience and practice are important parts of being a stained glass artisan, but never fear if you are lacking those requirements – they can be learned! Don’t be too hard on yourself as you are working on your first projects. You will be learning many new skills and they won’t be mastered overnight, but there will be great improvements with each project that you make. We want to act as a resource to provide answers to your technical questions even after the four weeks is finished. Advanced classes are available on a regular basis. Glass etching, lead came, lamp shade, bead making, mosaics, fusing, and repair classes are some of those offered. For information on these classes, ask us to put you on the Vinery’s mailing list. We can then keep you current on educational offerings. All our classes are available online. You will find pictures and descriptions and you can even register online!

Parking is available in the lot in front of the store. If necessary you may park in the back of the building or use the lot at the security firm next door to us on our east side. You may park in front of The Vinery Glass Gallery to the west of our building. Please do not park in front of the Winner’s Circle as they have clients in the evening. Once again, thank you for taking class at the Vinery.

~Denny & The Vinery Staff
Let’s Get Started!

Each Student will choose from selected patterns provided. Due to time constraints there will be no other choices. Your pattern choice should be made prior to class. Please give some thought to color selection before class. During the first night only 20 minutes will be allocated for glass selection. You can also make glass selections before the first or second night of class. The store will be open! Below is a tentative schedule for the four weeks:

Week:
1. Introductions and overview of the entire process of creating a stained glass panel will be presented. Pattern work, glass selection, and glass cutting will be covered.
2. Glass cutting, grinding and fitting
3. Glass grinding and foiling
4. Soldering, outside channel, hooks and patina.

You will be provided two copies of the pattern you choose for your first project. One of the copies will be on card stock. This is the copy that you will cut up for pattern pieces. Tool kits will be available for sale and will be discounted 10%. Another option is to rent a tool kit. The cost to rent a tool kit is $45. Included in the tool rental are all materials for your first project except for glass.

The following is included in the tool kit:
1. Soldering iron & stand
2. Rheostat
3. Combination pliers( breaker/ grozier)
4. Metal Running pliers
5. Push pins
6. Metal Border strips
7. Black and Gray sharpie
8. Pistol grip cutter
9. Flux, patina, finishing compound( shop)
10. Solder 60/40 and foil( enough to complete project)
11. Lead came for outside channel.
Beginning Stained Glass Patterns - 4 Week Class
Glass Cutter – Many different varieties are available. If you plan to pursue stained glass as a hobby, a cutter with a carbide wheel is best! Inexpensive cutters with steel wheels are available, but will last only one or two projects before getting dull. Although costlier, a carbide wheel lasts much longer, cuts better, and the heads are replaceable.

We carry several varieties of carbide cutters, some of which are held in different ways. Comfort is important, so ask to see different grips and feel free to try different models to see how they fit in your hand.

The different cutters work the same way; a wheel scratches or “scores” the surface of the glass as it rolls over it. The score creates a weak spot in the glass and this is where the glass breaks when you apply pressure to it. (Theoretically, anyway!)

Combination Pliers – These pliers are used to break glass that is too small to hold with your hand. They are also used to “groze” or nip away excess glass. Also called breaking/grozing pliers.

Running pliers – These are used to run straight or slightly curved scores on glass. The bottom jaw has a ridge in the center that applies pressure underneath the score. We suggest that you mark the top of your pliers with a felt tip pen so they are used in the correct manner. They should make a frown!

Soldering Iron – This tool is used to melt solder on to your project. The irons are rated in watts, which is a rough indication of the heat it will generate. We recommend a 100 watt iron for class, which is the wattage of the various irons in our kits. You will notice that the more expensive irons usually have a shorter shaft and are better balanced than the less expensive irons. They also have built in controllers to keep the iron at a constant temperature.

Rheostat – This tool allows you to control the temperature of a soldering iron that doesn’t already maintain a constant temperature. You will find the setting that
keeps the iron at a temperature that readily melts the solder, but isn’t so hot that rapid oxidation (black crud) appears on the iron tip.

**Solder** – An alloy of two metals, (in this case, tin and lead), used to bond two foiled or leaded sections of glass together. This bond occurs when heat is applied to the solder to melt these sections together. 60/40 (60% tin, 40% lead) solder is recommended for this class because it provides a smooth, flowing bead.

**Flux** – A chemical applied to metal being soldered. It cleans the joint by removing oxidation and helps the solder to flow evenly to form a smooth bead on your project. For best results, we recommend that you use a flux containing zinc chloride.

**Patina** – A chemical that changes the color of metal. “Black patina for lead” is often applied to silver solder lines to give them an antique black finish. Copper is also available.

**Cutting Oil** – A light weight oil used to lubricate the glass cutter. We keep our cutters in a jar with an oil-soaked paper towel, which is useful for wiping off debris as you work. We also suggest that glass cutters be stored with a coating of oil to retard rusting of the wheel.

**Copper Foil** – This thin metal has an adhesive back so it can be wrapped on each piece of glass to provide a base to melt solder onto. Solder will readily adhere to fluxed foil, but not to plain glass. Foil comes in different widths; we recommend 7/32” for beginning projects. It also comes in different colors. This is so that you can match it to your solder lines in case you are using glass that is transparent and the back of the foil is visible through the glass. “Black black” foil should be used for projects that will have black solder lines.

**Push Pins** – The best pins for stained glass have a longer shaft than most, which makes them ideal for pinning a project together onto your work board for soldering and transporting.

**Work Board** – This is necessary so that you can carry your project back and forth between class and home and so that you don’t ruin your work table when soldering. We recommend using homasote which is a fibrous board that is about ¾” thick. It is ideal because it is light weight and holds push pins well.

**Finishing Compound** – A wax that is applied to the surface of the glass and solder lines with a paper towel, allowed to dry to a haze, then buffed off with a soft cloth or brush. It adds a nice shin to your glass and metal, and is the final step in the creation of your project!
Step-By-Step Instructions for the Copper Foil Method

This is a general overview of the copper foil process. Each step will be fully explained during the class sessions!

1. Pattern Preparation.
   A. Staple the following items together at the top of the pack so they don’t shift during the copying process:
      - the actual pattern should be on top
      - then carbon paper, dark side facing down
      - pattern paper (the stiffer manilla kind) on the bottom
   Trace pattern on to thick pattern paper using this “pattern pack”. Use a ruler for any straight lines. Number all of your pieces and mark grain direction before separating the pack.
   B. Next, we recommend that you cover your original pattern (reference pattern) with clear contact paper to keep it from being damaged during the grinding and soldering processes.
   C. Cut out the pattern you traced on the pattern paper using regular scissors. Position the blades exactly down the middle of the pattern line.

2. Cutting
   A. Place the paper pattern piece on your glass. Trace around each pattern piece using either the black or silver marker on the glass you have chosen.
   B. Score each piece, positioning the glass cutter slightly inside the marker line. You want to cut away the marker so your project doesn’t “grow” outside of your original pattern dimensions.
   C. Break off the unwanted glass using your hands and your pliers when necessary.
   D. Grind the glass to exactly the shape of the pattern piece. Grind away your marker lines and any rough edges.

3. Lay Out
   A. Set up your homasote workboard. Lay the contact-papered reference pattern on the board and pin it down at the four corners. You will lay your foiled pieces on your pattern and pin around the outside edges of the piece. This keeps it from shifting while you solder.
B. Clean your pieces using soap and water or Hi Sheen glass cleaner. Be sure to clean off all the white grinding residue or the copper foil will not stick to the glass.

C. Foil and burnish each piece. Try to keep the foil evenly applied around all of the edges. Lay your foiled pieces on your pattern and pin your project down.

4. Soldering
   A. Flux and tack solder all the points at which the pieces intersect. Once this is done, you can remove the pins.
   B. Solder the front of your piece, stopping your seams ¼” away from the edges. This prevents solder from interfering with the zinc border that will be put on later.
   C. Flux the back of your panel. Use a little less flux on this side because some of the flux from the front will have seeped through to the back. It is not necessary to tack solder this side since your pieces are already held together on the front.
   D. Turn the panel back over and fix any areas that need to be touched up. This includes any “flow throughs” of solder from the back side.

5. Finishing
   A. Put channel around the piece, soldering at all intersections and where the corners of your zinc meet.
   B. Add hooks or rings to the back of the panel. It is always best to attach them where there is a solder seam for extra strength.
   C. Clean the panel with soap, water and a brush. It is important to get all of the flux off your project.
   D. Patina your piece. Wear gloves and work over a pad of newspaper to protect the tabletop. Apply the patina with a piece of paper towel. When the patina on the towel turns brown, it is exhausted. Apply fresh patina with a new area of paper towel. If you are applying copper patina, rub finishing compound on your solder lines with the patina. This little trick allows the copper patina to adhere more evenly to the metal.
   E. Rinse your panel with water. All of the patina needs to be removed from the glass.
   F. Apply finishing compound to both sides of the panel with a paper towel and allow it to dry to a white haze. Buff to a shine with a soft cloth or brush.
       Attach chain for hanging. ENJOY!!!
Stained Glass Cutting Guide

1. Try holding the cutter with two hands for better control when the surface of the glass is rough or pitted.

2. Keep the cutter lubricated with a light weight oil to extend the life of the cutter and to allow it to roll freely.

3. Try starting the score about 1/16 of an inch in from the edge of the glass and stopping the score before the cutter head rolls over the opposite edge of the glass. Rolling off the edge could cause the glass to crack.

4. Always push the cutter away from you to score the glass. This enables you to see the line that you are trying to cut.

5. Never score the same line twice. This is hard on your cutter and produces a very irregular score line that is hard to break.

6. The depth of the score line is critical to the glass breaking properly. A score that is too deep will cause tiny stress cracks along the score line, which may begin to run when you break the glass or when heated by your soldering iron.

7. Tapping underneath the score line on a deep inside curve will facilitate breaking, but don’t tap on straight lines or outside curves. This creates unwanted uneven edges on the glass. There is one exception to this rule, and this is that you may tap a straight line on the edge to get your run started.

8. Keep your face and eyes away from breaking glass. When glass breaks, small shards may fly!

9. Always roll your hands into a fist when breaking glass to protect your finger tips from sharp edges if the glass doesn’t break properly.
The edge of the glass may be used. Make sure that this edge is straight!

The inside curve is always cut and broken out first.

Score the circle first. This usually can't be done in one continuous score. Score the circle until the position of the cutter becomes awkward then reposition the glass. Continue scoring the glass where you left off. The end of the score can be found by lightly rolling the cutter in the existing score until you reach the end. Begin applying pressure. After the circle is cut, score the auxiliary lines. Do not let these score lines cross over the circle score line.

By positioning the banana shape with points close to the edge of the glass, less glass is used and one less cut has to be made.

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Do not break this area off until scores 1-4 are made and glass is removed.

An example of an impossible cut. This will break at this point either while cutting or if any stress is placed on the glass.

Score lines 1, 2 and 3. Break glass away. This leaves a small piece to break after score 4 is made. This little piece you are breaking off is more likely to break than the good piece you are trying to cut out.
SAFETY!

Working in stained glass can be very safe, but you must take certain precautions to avoid injury or harm. The following are some things to be aware of when making stained glass:

1. Wear safety glasses to keep glass out of your eyes.
2. Take your time when selecting & handling glass. Pick up one piece at a time and feel free to set glass on the counter when you are shopping and choosing your colors.
3. Break glass properly to reduce the risk of serious cuts. When holding a piece of glass to break, roll your fists on either side of the score line. Break with an upward pressure and pull apart at the same time. Keep the glass close to the tabletop, not in your face. Never break glass over the edge of the table, as this could cause a very serious cut if the glass doesn’t break cleanly.
4. Keep your work area clean. Use a bench brush to sweep your glass chips & scraps into the glass buckets and boxes (not the garbage cans) by the work tables.
5. **Never leave sheets of glass hanging over the edge of the table.** A passerby may cut him/herself.
6. Wash your hands when you come in contact with a lead product. A common source of contamination is from hand to mouth, so be sure not to eat or put your hands in your mouth while working with stained glass. There are many areas of the studio in which we work with lead, so make a habit of washing your hands before leaving class.
7. Cover open cuts on your hands before handling lead. Band-Aids and gloves are always kept by the sink. Please ask if you can’t find them, or they need to be restocked.
8. Work in a well ventilated area. Open those basement windows, use a fume trap or small fan to disperse solder and flux fumes, and keep your nose a safe distance from the soldering iron.

9. Keep all lead products away from children and pets. They are more sensitive to lead than adults.

10. Be aware that flux is an irritant. Wash your hands well and keep all chemicals away from your face and eyes.

11. Use chemicals such as patina safely. Wear gloves when working with them and protect your work surface with newspaper.

12. Store your stained glass supplies out of the reach of children and pets.

13. Please dispose of lead properly. Save any lead and solder scraps and bring them to the Vinery to be recycled, if you wish.

14. If you ever have any questions about how to use a tool or chemical, please ask while you’re at the studio or give us a

**Safety First**

The signature below is to acknowledge that you have read the section of safety provided to you by the Vinery. It is requested that you wear safety glasses to protect your eyes while working at the Vinery. It is requested that you wash your hands at the end of every class to reduce the chance of ingesting lead from your hands.

I, ________________________ have read the above information on safety. I agree to wear safety glasses while working with glass or soldering. I will hold the Vinery harmless in case of injury while taking classes. The Vinery agrees to promote safety in the classroom as mentioned in the outline above.

Signature____________________________ Date_______