

Cutting Class

By Jamie Janczak
Photos by Joseph Jaworski
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What better way to get out of writing a paper than learning to cut a gemstone— for college credit?

Wander around the third floor of the University of Texas (UT) Austin geology building, and you'll hear the keen, nails-on-a-chalkboard pitch of a hard surface meeting a diamond lap. Is it the sound of a professor working on a pet project during her off time? Hardly. Duck your head into the lab, and you'll see a group of students struggling to facet their first round brilliant gemstones, with



Student Cristen Guest examines her gemstone under a loupe.

guidance from patient teaching assistants. The lapidary facility at the University of Texas, one of a few of its kind in the United States, is outfitted with all the equipment one needs for grinding and shaping gemstone-grade material. Nevertheless, access to these tools is not restricted to faculty or graduate students. The round brilliant the undergraduates are carefully crafting is a graded component of an upper-division geology course entitled "Gems and Gem Minerals," a class with few prerequisites and designed for non-science majors. Many of the students have never handled heavy machinery, or tools of any kind. Yet, at the end of the semester, many of them have a faceted gemstone and several cabochons to show off to friends and family, as well as having had their curiosity piqued about the art of jewelry making.

It's true that other lapidary facilities exist at junior colleges, trade schools, and even universities. However, the equipment housed at the UT stands out because it is a component of a geology program, not a fine arts one. The cabochon and faceting laboratories here are relatively unrestricted, and are open to inexperienced but interested junior-level undergraduates. How did this distinctive setup get started? According to Dr. Mark Helper, who has been teaching the class since 1987, the initial goal of creating a science course in gems and gem minerals "was to attract students to the geology department to [become] geology majors." While the course had existed since the late '60s under the direction of Dr. Fred Bullard, the popular facility for faceting gemstones was not yet there. This scenario changed after Bullard's retirement, taking root in 1976 with significant help from Glenn and Martha Vargas, authors of *Faceting for Amateurs* and members of the National Lapidary and Rockhound Hall of Fame. Says Helper, "Dr. Earl Ingerson, a geochemist, mineralogist, and man of many talents, was then teaching the class. He had established a lab for cabochon cutting and wanted to add faceting. Earl learned of Glenn's impending retirement from a lapidary teaching position in the Palm Spring area of California and invited Glenn and Martha to Austin to teach faceting as a part of his class that fall."

Raising Eyebrows.



Interestingly, the two made their first connections through Lapidary Journal. "Glenn had wanted to facet a tektite, a glass produced by meteorite impact. A 1972 Lapidary Journal article on tektites and our tektite collection by another UT professor, Dr. Virgil Barnes, prompted him to contact our geosciences department, where he began to correspond with Dr. Ingerson. The University bought one faceting machine that first year and the Vargases supplied another."

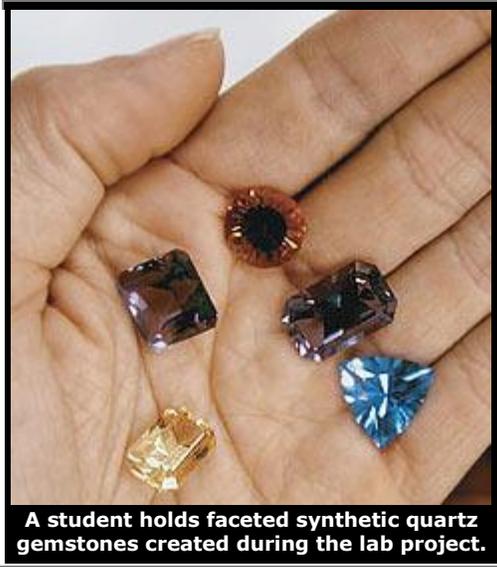


Teaching assistant Lauren Duncan uses one of the machines in the faceting lab.

The faceting portion of the course, while fun and educational for all involved, had humble beginnings, and was initially located in a building outside of the geology department. During the first semester that a faceting project was offered, 12 students were taught to facet on the two machines. After the popularity of the class grew to a peak level of 80 interested students per semester, lab space was dedicated for the course inside the geology building. Now, in addition to the fully equipped cabochon lab, the faceting lab at UT contains 10 platform-style Vargas faceting machines, plus a spare.

Understandably, the equipment may raise a few eyebrows with experienced faceters. Dr. Helper claims, "Platform machines are virtually extinct now. [Most] people buying a faceting machine [today] would probably buy a mast and staff type." Why not use a more up-to-date setup? Upon closer examination, we see that the older faceting equipment remains in the lab on purpose. Apparently, platform machines have "several advantages for teaching. With the [mast and staff] machines, I'd have to bend my neck and look at the gem that's still on the staff. It's nice that [students] can pick up the handset and bring it to me to look at, without having to worry about removing the stick from the machine."

It is possible for students to facet and polish materials as hard as corundum in the faceting lab, but Dr. Helper emphasizes there are logistical problems with harder stones. "Of course, the diamond laps will cut just about anything, but the machines we have don't turn quite fast enough to cut diamond. We can certainly cut anything else, but the difficulty comes in with polishing. Because we teach so many students a semester, anywhere from 50 to 80, we have to have polishing laps that I can pass from student to student.



A student holds faceted synthetic quartz gemstones created during the lab project.

"For example, cerium oxide, alumina-B, and tin-lead polishing laps can be used by many people without any difficulty; these can be traded around and you will still get the same result. But to polish things like corundum or CZ, you have to go to diamond on a ceramic lap, or explore some other options. Basically, that's a more demanding process; most faceters would never lend these polishing laps to somebody else to use. You break them in, and tune them to your unique style. It wouldn't be possible for us to have 50 ceramic laps . . . it wouldn't be possible for us to have 50 people in the lab at once! But we do have that equipment, and students, will,

on occasion, go on to polish corundum and CZ. Students have also polished topaz many, many times, and topaz is about as hard as we routinely polish in [the lab,] with the rare occasion of the students [who] cut sapphires."

Normally, for his or her lapidary project, a student will complete one faceted gemstone and three cabochons, or two faceted gemstones. However, Dr. Helper remembers one student who was especially ambitious. "I had a student named Kian-Peng Sim in 1989, whose father was in the gem business. And he was a graduating senior, and he didn't have any other classes! He took the gems class, and that was it. He did 17 faceted gemstones that semester. And that's by far the most anybody's ever cut in there. It's unusual to have somebody cut three or four — so for him to cut 17 was really remarkable. He had exacting, perfectionist standards, so he was basically in there all the time."

What do students do with their gems when they're finished? Many of them place them in a setting with the aid of Dr. Helper, or choose to display them in their loose form. A minority of students choose to utilize UT Austin's respectably equipped metals shop, which is in the Fine Arts Department. Art students, some looking for a new skill and others for what they view as an easy class, have flocked to the Gems and Gem Minerals course in the past. "Unfortunately, I've never made that connection with any of the faculty in Fine Arts, but I know that students from over there have found out about this class by word of mouth," states Dr. Helper. "Some students taking both metal shop and this class at the same time have been able to integrate the gems they make into their art projects via casting, wire wrapping, and other techniques."

Opting In

The lapidary project is not a required portion of the course; students can opt out and choose to write a short paper about gems instead. But the majority of students prefer the challenge of faceting a stone. "About 80 to 90 percent of students will facet a gemstone. Probably more like 80 percent finish, but more than 90 percent start. Then, something like 40 to 50 percent of [those] will go on and cut a second



Students generally work on their gemstone projects during lab hours, where they can get guidance from teaching assistants. Above is student Cristen Guest.

gem, and the other students will cut cabochons." Incorporating a project in the course also has a practical edge for Dr. Helper. "The things I talk about in lecture are a lot easier to grasp if a student has hands-on experience. So, if they have a stone, and I tell them that the culet angle should be 42 degrees, the students are actually cutting a few stones at 42 degrees, and they see the protractor at 42 degrees. I can show them gemstones that are not cut at 42 degrees, and they can see for themselves the difference, and they'll never look at a gemstone the same way again."

The do-it-yourself approach of the lapidary portion of this course teaches many things to students, not only in regard to geology, but in regard to their own skills. Over the course of nearly 40 years, the Gems and Gem Minerals course has touched many lives in a positive way. Dr. Helper seems pleased by the course's role as a catalyst for gemological interest, and his own role as a mentor. "I think the experience of working with the faceting machine, not knowing anything about it before you start, and then being able to produce something as beautiful as a gemstone, is a remarkable accomplishment for most people, and they come out of it with a renewed sense of confidence. [The students] have an ability they didn't know they had . . . some will go on for the rest of their lives and do it as a hobby. Sometimes, after sparking an interest in mineralogy, some will become geology majors and go on to careers as geologists." Indeed, programs like the one at UT Austin help create the next generation of professional jewelers, hobbyists, and educated jewelry buyers who value and recognize the time, effort, and passion of the lapidary community. The unique approach and stellar resources of the Gems and Gem Minerals program at UT are a model example for other major four-year institutions across the nation.

A Lapidary Legacy



The names of Glenn Vargas and Martha Vargas, supporters and former teachers of UT's Gems and Gem Minerals course, are well known to many lapidary hobbyists and professionals. Their reference books *Diagrams for Faceting* (volumes 1 through 3) and *Faceting for Amateurs* are considered authoritative in the gem trade, and several well-worn copies adorn the UT faceting lab. Lucky students once had personal help from

these passionate gem experts, who truly enjoyed sharing the skill of faceting with others. Sadly, Martha Vargas died in the year 2000. Glenn is currently 90 years old, and has recently published a fourth edition of *Faceting for Amateurs*. While his participation in the course diminished after his wife's death, Vargas continued to visit Austin as late as 2002. Their contributions to the class and the University of Texas will survive them. Among numerous generous gifts, they have endowed an undergraduate scholarship in Geological Sciences, a fund for Gem and Gem Mineral Instruction, and a fund for Gem and Mineral Curation. Perhaps the most extraordinary gift is the Vargas Gem and Mineral Collection, some 5000-plus mineral specimens and gemstones that comprise a legacy of the best of a lifetime of collecting, faceting and participating in gem and mineral trade. —JJ

Jamie Janczak is a freelance writer, who graduated with her B.A. in English from the University of Texas at Austin in 2004. She took Dr. Helper's gem course, and made a Mother's Day necklace from her round brilliant gemstone project. Currently, she resides in The Woodlands, Texas.