

**A handful of educators and metalcasters are working to put the ancient art back into secondary school curriculum.**

Shea Gibbs, Senior Editor

**L**isa Hudson isn't sure if high school course offerings for metalcasting classes are down over the past decade. It's just not something she is capable of saying. Hudson, after all, is an education statistician for the National Center for Education Statistics (NCES), and she lets the data do the talking.

Hudson's employer doesn't keep statistics on metalcasting classes—that's too specific for an organization that keeps tabs on the nation's vast network of primary and secondary schools. But, when asked, she follows up on a hunch that high school students are taking fewer manufacturing classes these days than they have in the past.

The hunch is correct. NCES files metalcasting education under the materials production heading of a larger category called precision production, itself a subsection of occupational education. In addition to metalcasting, the category includes courses

such as machine shop, welding and woodworking. And while the credits earned in the category have leveled off over the past nine years, the number dropped by almost 33% from 1990 to 2000. Today, the average high school graduate will have earned only 0.16 credits in materials production by the time he or she moves on to the next stage in life, whatever that might be.

By way of comparison, the average

high school graduate will matriculate with 0.55 credits earned in computer technology, up 83% since 1990. Some educators and metalcasting industry members think those are lopsided growth curves.

"The schools nowadays have done away with industrial arts," said Fred Frese, a teacher of the subject at Old Saybrook High School, Old Saybrook, Conn. "Everyone's on the computer gig, and that's that. It's a shame."

That's not to say Frese has thrown his hands up. He, like a number of others in the education world and metalcasting industry, is still working to keep metalcasting in the nation's high schools, and keep qualified casting personnel flowing through the doors of needy companies.

---

**"The schools nowadays have done away with industrial arts. Everyone's on the computer gig, and that's that. It's a shame."**

—Fred Frese, Old Saybrook High School

---



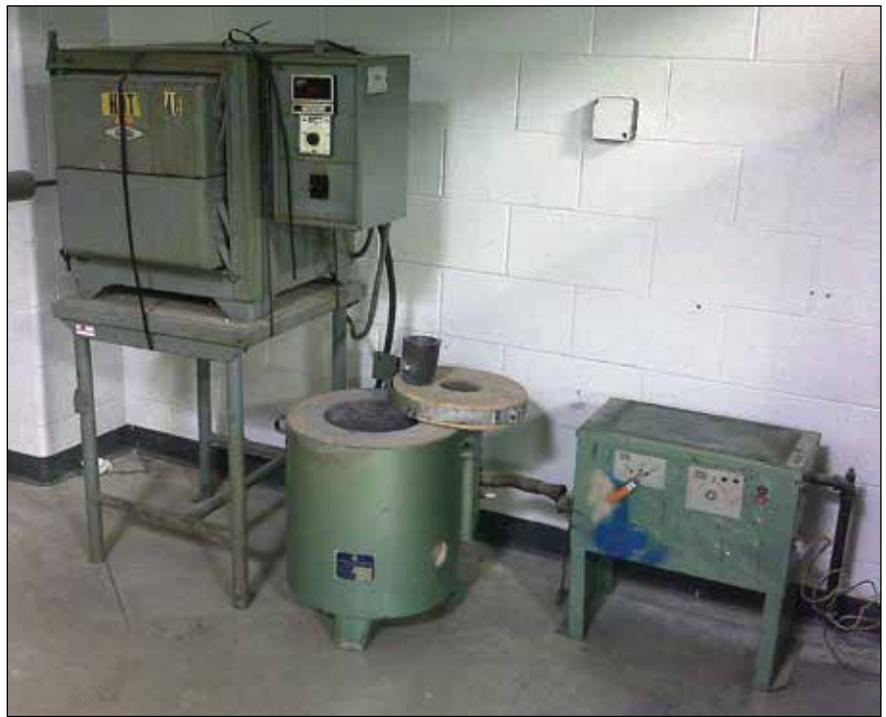
**When Old Saybrook Became New Saybrook**

Just a couple hundred yards from where Frese works, locked up in

a storage facility, are the makings of a fully-functioning metalcasting facility. Old Saybrook High School once offered courses specifically tailored around metalcasting, and students could not only make their own casting molds, but they could pour and shake out white metal castings on campus.

Today, they can only get halfway through that process, and even then only in classes that deal with metalcasting indirectly. Several years ago, Frese developed the first of what has become a series of elective classes that inject at least some metalcasting back into his high school's curriculum. The goal of the classes is to complete the construction of a fully functioning replica of the world's first war-ready submersible, the Turtle. In the course of the Turtle's construction, students work with a variety of materials and manufacturing processes, including metalcasting.

For the first Turtle project, Frese and his students developed an accurate pattern for the hatch of the submersible, a top hat-shaped sphere of cast metal. After the patterns were made, the students assisted in mold making. But that's where their direct involvement in the metalcasting process ended. The finished product had to be produced off campus, at Mystic River Foundry LLC, Mystic, Conn.



The metalcasting equipment at Bartlett High School currently is not operational, but one of the school's teachers, Stephen Buchs, is optimistic about the prospects of setting it up.

Frese took the students on a tour of the metalcasting facility to see how the casting would eventually be done, but the hands-on aspect of the learning process that Frese so values in his line of work was lost.

"That's it for metalcasting," Frese said. "When we were in the [metalcast-

ing facility] in Mystic, we saw there's so much safety involved it makes it real difficult to do in-house."

Going forward, Frese intends to continue to keep metalcasting in front of some students through classes centered on Turtle projects. Recently, he and his students were invited to build a new submersible and enter it into the national submarine races in 2011. According to Frese, his will be the only high school program entering the competition against a number of engineering universities. He plans to get started on the new boat next year, and, as always, there will be a number of metal castings involved in the construction.

### The Dry Run

Stephen Buchs' metalcasting equipment is even closer than Frese's. In fact, it's right under his nose.

Buchs is an instructor in the industrial technology department of Bartlett High School, Bartlett, Ill. As part of the department's curriculum, students can learn about a variety of materials and manufacturing methods. And, the school has equipment on hand for a full metalworking lab and metalcasting facility. The problem is: the equipment isn't yet functional.

In one corner of the classroom sits

Occupational Education Credits Earned by High School Graduates			
AREA	1990	2000	2005
Agriculture	0.20	0.25	0.23
Business management	0.16	0.16	0.16
Business services	0.72	0.58	0.44
Marketing	0.16	0.16	0.15
Communications technology	0.09	0.15	0.19
Computer technology	0.30	0.42	0.55
Other technology credits	0.01	0.05	0.04
Construction	0.10	0.11	0.10
Mechanics and repair	0.20	0.19	0.17
Transportation	0.01	0.01	0.01
Materials production	0.23	0.16	0.16
Print production	0.25	0.27	0.24
Other precision production	0.09	0.06	0.03
Health care	0.04	0.13	0.15
Child care and education	0.06	0.09	0.10
Protective services	0	0.03	0.04
Food service and hospitality	0.04	0.05	0.09
Personal and other services	0.10	0.08	0.08
Other1	0.13	0.08	0.11
<b>Total</b>	<b>2.89</b>	<b>3.03</b>	<b>3.03</b>

1—includes unspecified occupational education coursework.  
The information in this table is provided by the National Center for Education Statistics.

a gas-fired furnace that has yet to be hooked up to the gas line with duct work for a hood that doesn't ventilate properly. What's more, some of the components of the furnace aren't compatible. All in all, there is still an engineering challenge to be overcome before the metalcasting facility is up and running.

However, according to Buchs, the engineering challenge pales in comparison to the challenges of pushing full metalcasting education past the curriculum gatekeepers. The idea needs the support of both the school principal and the district superintendent before it can go forward. Next, the material can be massaged to incorporate it into the existing industrial arts programming. Buchs currently is in talks with industry experts to discuss ways to integrate the metalcasting facility into school curriculum.

### A Supplier Steps In

Engineers from a large multinational company peered over the shoulder of a young man at Reich Companies, Trussville, Ala., during a recent meeting. The young man was using the latest 3-D software as he skillfully assisted the engineers in determining clearances and positioning of large machinery in their new plant layout. The scene

---

**“This [partnership with a high school] allows young talent to experience the global aspects of the functions of a small metalcasting equipment company, going beyond the software applications and learning how to meet the primary needs of developing customer requirements.” —Peter Reich, Reich Companies**

---



would have been commonplace, except that the young man leading the demonstration, Austin Clements, had not yet graduated from Hewitt Trussville High School.

For Reich, partnerships are nothing new. The local firm has been forming them as a supplier to metalcasters since 1938. Recently, the company encouraged the high school to work with it in assisting with support drafting tasks.

“This allows young talent to experience the global aspects of the functions of a small metalcasting equipment company, going beyond the software applications and learning how to meet the primary needs of developing cus-

tomers requirements,” said Peter Reich, who co-owns Reich Companies with his brother David.

The partnership was well received by Hewitt Trussville, which focuses on real world learning for its students, and Clements was a good fit. Reich found the student, mentored by the company's own Jarek Olszak, to have an inspiring talent, work ethic and maturity.

Chris Bond, Clements' high school instructor, said other local businesses may benefit from partnering with Hewitt Trussville students.

“Engineering firms, manufacturing companies who use drafting/CAD, architectural firms, electrical wiring installers...anyone who uses and needs blueprints/CAD drawings created” can benefit, according to Bond.

Bond sees a bright future for the engineering academy at Hewitt Trussville and the students who are participating in the curriculum.

“We are one of a few engineering academies in the state,” he said. “There are a few who have been around longer and who are more established, but I think we have the resources and teachers to make ours the top program. We are working hard to incorporate local companies into our program (through an advisor counsel and through class projects) so we can build our curriculum to be relevant to the industries that our students will enter into. We are focused on giving our students the best preparation they can receive prior to entering into an engineering program in college.”

MC

*Portions of this article appear with permission of the Trussville Tribune, Trussville, Ala.*



**Hewitt Trussville's Austin Clements verifies equipment dimensions for 3D image at Reich Companies.**

# MODERN CASTING

MODERNCASTING.COM

A PUBLICATION OF THE AMERICAN FOUNDRY SOCIETY | NOVEMBER 2018



## 2019 Buyer's Guide

**ADDITIVE TAKEAWAYS**  
p.32

**MN AND S IN CAST IRON**  
p.38



At the core of great foundries.™

**DENISON INDUSTRIES**  
PREMIUM ALUMINUM AND MAGNESIUM  
CASTINGS AND MACHINING



LAEMPEREICH.COM

USA | 903.786.6500