The Program

Purdue University's Polytechnic learning environment is designed to produce graduates who have deep knowledge, applied skills, and experiences in their chosen discipline.

Purdue Polytechnic Institute (formerly the College of Technology) combines innovative learning methods, real-world experiences, and industry partnerships to offer students a complete educational opportunity. Graduates will be uniquely qualified for technology-driven careers in a variety of industries.

The Engineering Technology programs focus on the methods, materials, machinery and manpower necessary to effectively operate in a manufacturing environment. Students will learn how to manage people, machines, and production resources, as well as problem solving, critical thinking, communications, and leadership skills sought by industries and communities.

In Mechanical Engineering Technology, students can earn a BS, MS and/or PhD; a BS and MS in Manufacturing Engineering Technology are also available.

The Curriculum

Several courses in the School of Engineering Technology are directly related to metalcasting. All four of these include lab work for the students.

Materials and Processes I is a course introducing students to material properties & behavior as well as metal forming. Advanced Materials in Manufacturing covers phase diagrams, formation of microstructure, solidification, and phase transformations. Applied Projects in Metalcasting is a senior capstone course. Students complete two or three projects from initial design of gating and risering, simulations and optimization of casting design, to pattern making, sand preparation, melting, and pouring.

In Optimization of Metalcasting Design students learn basic principles of solidification and defect formation in castings – analytical equations, numerical simulations, and case studies on how to use the basic principles for optimal casting design are all covered.

The Facilities

The metalcasting lab provides students opportunities to put theory into practice and experience firsthand how to make castings and use simulation tools for improving the quality of castings. They are also able to experience materials testing and characterization, and they can use the equipment to physically determine how materials are affected. The lab includes equipment that allows students to melt alloys, make molds, pour liquid metal, clean castings, and evaluate the quality of castings. Some of the machines that are housed in the lab are: two 300 lb. induction melting units, a 16 ton die casting machine, spectrometer, computer simulation software (MAGMA), metallic specimen polishers, hardness testers, metallography equipment, and impact testers.
The Professor

Milan Rakita received his initial engineering education at the University of Novi Sad in Serbia. He then received his PhD in Mechanical Engineering Technology at Purdue University. Prior to accepting his current position as Clinical Assistant Professor at Purdue’s School of Engineering Technology (2014), Milan was a Graduate Research Assistant at Purdue from 2007-2013.

Milan can be reached at mrakita@purdue.edu. The FEF Key School Contact for Purdue University is Dave Clark who can be reached at david@iscastings.com.

The Students

Processes and experiences that are available to the students are:

- **Molding:** Green Sand, Chemically Bonded, Permanent Mold, 3-D Sand Printing, Investment Casting, Die Casting, and Lost Foam
- **Metals:** Aluminum, Magnesium, and Zinc
- **Core Making, Pattern Making, Casting Simulation**
- **Processes:** Machining, Heat Treating, Metallography, Mechanical Testing, and Metrology

One of the ways Purdue University students share their love of metalcasting is by hosting AFS Casting Nights – other “major” students are invited to these once-a-month events to see casting in action. Students also attend AFS Student chapter meetings as well as the monthly local AFS chapter meetings. Foundry tours provide the students with the opportunity to network with industry representatives and see in action, the processes they are learning in their classes; they are able to put their learning to the test in the regional casting competitions that they enter.

Over the past four years, 19 FEF registered students have taken a job in metalcasting or related industry, and 10 students have participated in internships and/or co-ops in metalcasting or related industry in the past two years.