Michael Short spans classroom, forge, reactor

Massachusetts Institute of Technology
Department of Nuclear Science and Engineering research scientist Michael Short '05, SM '10, PhD '10 is an exemplar of interdisciplinary knowledge, with Institute degrees in both nuclear science and engineering and materials science and engineering.

“Interdisciplinary work is where the fun stuff is; it’s where you get to work on challenges that many people consider too difficult, or that require a broader perspective,” he says.

But there’s another dimension to Short’s interdisciplinary skill set — extensive hands-on metalworking experience, which amplifies the value of his academic learning and his ability to address challenging problems in fission reactor development.

“In my freshman year, I started Course 22 and took a blacksmithing class. I’ve stayed with both ever since,” says Short, who is also a staff member at the Institute’s cross-departmental Uhlig Corrosion Laboratory. “The combination has led me to many advances in the research realm. You can theorize about a part or a model, but if you’ve held a piece of hot steel in your hands, you’ll have better insight into how it will behave. You pick up intuitive knowledge; the combination of that and book knowledge is worth more than the sum of the parts.”

For this reason, Short takes his students in class 22.033, Nuclear Systems Design, beyond books and paper. “The students heat-treat metal using the forge in Building 4, and see how an improperly treated piece becomes brittle and breaks apart, while a well-treated one stays tough and strong,” he explains. Short has also abandoned laser pointers in class, instead using a different reactor part each week as a visual aid. This gives students a tangible sense of what they’re studying and working on — a challenge with nuclear reactors.

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