Universities exist in order to create and transfer knowledge. Whether in the form of a theory, a technique, or an apparatus, knowledge has the capacity to transform human experience. It enables innovation, creates value, instills competence, and inspires debate. IPFW faculty are engaged in the creative process of research every day in our laboratories, our studios, our classrooms, and in the surrounding community.

These featured faculty embody IPFW’s commitment to this most essential facet of university life.

William McKinney
IPFW Vice Chancellor for Academic Affairs

2011 IPFW Featured Faculty
CREATING KNOWLEDGE

2011 IPFW FEATURED FACULTY LECTURE SERIES
Every Friday in February, students, faculty, staff, and the public are invited to meet the Featured Faculty and learn about their outstanding work.

February 4
William DeMott
professor of biology
“Life, Death and Evolution in Plankton Food Chains”

February 11
Hedayeh Samavati
professor of economics
“The Economics of Crime: Robbing a Bank?”

February 18
Hosni Abu-Mulaweh
professor of mechanical engineering
“Energy Applications for Daily Life”

February 25
James Moore
associate dean, Doermer School of Business and professor of management
“Data Mining: Good Science or Black Magic?”
Hosni Abu-Mulaweh, professor of mechanical engineering

*New knowledge enables innovation.* Hosni Abu-Mulaweh’s innovative research is about converting energy, using the principles of heat transfer, thermodynamics, and fluid mechanics. As a mechanical engineer, his goal is to improve the performance of many devices such as heat pumps, refrigerators, and electronic equipment—all of which would fail prematurely if not for an effective way to dissipate large quantities of heat as the devices operate.

Hosni’s work, as he mentors his students, is about positively impacting daily life. “Engineers are continuously working on technologies to improve the performance and efficiency of energy systems,” he says. “Every kilowatt hour of electricity or gallon of gas saved by efficiency means we do not have to consume as many fossil fuels.”

He and several of his undergraduate students have established an impressive track record toward the pursuit of better energy system solutions. In collaboration with Fort Wayne-based Water Furnace International, they designed a control system for an electronic thermal expansion valve for a geothermal heat pump.

Hosni says mechanical engineering is his passion because it is the broadest engineering field. “With a technical degree one can operate and repair a device,” he says. “With an IPFW degree in engineering, our students learn the fundamentals and can design the device.”

**Education:** Ph.D. in mechanical engineering from the Missouri University of Science and Technology
**Teaching Experience:** IPFW, Iowa State University, Birzeit University
**Consulting Experience:** American Felt and Manufacturing

William DeMott, professor of biology

*New knowledge creates value.* To William DeMott, pure research has value. He studies zooplankton, which are tiny aquatic animals comparable in size to a fleck of dandruff. He focuses on the behaviors, population characteristics, and evolution of these microscopic crustaceans. Zooplankton act as intermediate links in open water food chains because they eat algae and each other, and in turn, are eaten by fish. As a renowned limnologist, or researcher who studies lake ecology, William says zooplankton serve as model organisms for study due to their small size and rapid population growth.

William enjoys the international nature of scientific exploration. He has done research at centers for limnology in Germany and The Netherlands. Close to home, at the IPFW Crooked Lake Biological Station near Columbia City, Ind., his students have the opportunity to join him and conduct their own experiments on the lake’s food chain dynamics. With four grants sponsored by the National Science Foundation, totaling $480,000, he hired undergraduate students to become more deeply involved in his aquatic research.

The examination of zooplankton has relevance for environmental preservation because it demonstrates how basic populations interact with one another and how permutations, such as pollution and global warming, affect food chains. “In order to understand these very practical things, you have to understand the basic functions of life,” he says.

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**Education:** Ph.D. in biology from Dartmouth College
**Teaching Experience:** IPFW, The Ohio State University
**Consulting Experience** for Ecology, Fundamental and Applied Limnology

Hedayeh Samavati, professor of economics

*New knowledge inspires debate.* Hedayeh Samavati is an empirical economist—an expert who collects data, analyzes them, and recommends policies or directions to improve economic outcomes. She is drawn to events that affect people’s welfare—often controversial topics.

The span of her research has addressed Indiana’s standing as the home foreclosure capital of America during the “jobless recovery” of 2001, and the Social Security solvency debate. Major events affecting financial markets have been prominent research topics for Hedayeh. She has studied the debt crisis of the 1980s, the currency crisis of the 1990s, and the ensuing capital flight from Southeast Asia.

Hedayeh’s current research explores a local problem; between 2000 and 2001, bank robberies rose 90 percent in Fort Wayne. While authorities focused on the usual date, time, and location characteristics, Hedayeh looked for trends related to immediate surroundings, access to a police station, and proximity to a highway as potential factors to thwart future theft. “Bank robberies impact the cost of the business of banking, which affects households, businesses, and government units,” she says.

Hedayeh, the study of economics is more than dollars and cents; it’s about using sense with dollars and the entire decision-making process.

**Education:** Ph.D. in economics from Iowa State University
**Teaching Experience:** IPFW, Iowa State University, Knox College
**Consulting Experience:** Allen County Court System, Walmart

James Moore, professor of management

*New knowledge instills competence.* James Moore likes to get into a person’s head. He’s not a psychologist; he’s more like a business coach.

His expertise is operations research, or applying analytical techniques to support decision making. By definition, business executives are decision makers. “I try to teach our students how to make skilful decisions, and that means bringing out the Spock in them,” he says.

James’ specific approach is to teach others how to mine relevant data, recognize patterns, and use formal models to make better decisions. “Students need formal analysis to support their decisions,” James says. “After their preparation is in place, they will gain experience and develop the instincts of effective managers.”

James’ most recent publication explores bank behavior during the current recession, and which institutional attributes led to success or demise. During a recent sabbatical, he examined data relevant to student success, searching for clues that could predict which students might be at risk—a project that could lead to an early warning system for advisors and counselors. Given the foraging nature of research, James advocates tenacity. “You have to kiss a lot of frogs until you encounter the prince or princess,” he says.

**Education:** Ph.D. in economics from Purdue University
**Teaching Experience:** IPFW, Iowa State University
**Consulting Experience:** Forecasting, statistical, and present value analysis for numerous regional firms