

- Stryker Medical
- Meijer
- Jet Engineering
- Pratt & Whitney
- MBI International
- MSU Federal Credit Union
- McCleer Power

- MSU Extension
- Neogen Corporation
- B.F. Goodrich
- Ingham County Drain Commission
- Michigan Department of Environmental Quality

Spotlight on Success

Today's most intractable societal issues will only be solved by interdisciplinary research efforts. In order to educate and train the future leaders necessary to make substantial progress and to focus the best young minds on those issues, Michigan needs innovative doctoral graduate programs.

"The PSM is being called the MBA for scientists and mathematicians. It's an education aimed at future managers who will be able to move comfortably in the business of science, from a meeting about enzymes to another about intellectual property rights, all the while understanding the goal is not a scientific journal article but marketable products. Experts predict it will become the twenty-first century's fastest ticket to the major leagues in business and government. ... 'Business is getting too scientific to be managed by businessmen,' says Charles MacCluer, director of MSU's PSM program in industrial mathematics. 'They need a new hybrid, a scientifically trained person.'"

— Del Jones. "Add Science, Business, Mathematics and Stir: New Degree Offers Career Outside Lab." *USA Today* online, July 18, 2004.

MICHIGAN STATE
UNIVERSITY

Advancing Knowledge.
Transforming Lives.

For more information contact:

Ann Beaujean, director, State Relations, beaujean@msu.edu, 355-5060, www.msu.edu/unit/vpga

Information compiled by Karen Klomprens, dean, The Graduate School.

MICHIGAN STATE
UNIVERSITY

Advancing Knowledge.
Transforming Lives.

Outcomes for Michigan's Future

MSU: Graduate Studies Preparing People for Jobs and the New Economy

In Brief:

Graduate education is of fundamental importance in preparing the necessary leaders for the knowledge economy of the twenty-first century. Advanced training at both the master's and doctoral levels prepares students for leadership roles in the academy, industry and business, non-government agencies, and government agencies. Students with advanced degrees also are well prepared for a life of learning.

Graduate students completing their programs have in-depth content knowledge in a disciplinary field or sub-field, knowledge and skills required by licensing or accrediting bodies to become a practitioner, and, in the case of the Ph.D. student, the training for and completion of independent research/scholarship that is an original contribution to the body of knowledge in a disciplinary or interdisciplinary field.

Master's degree students are prepared for a wide variety of positions, many in areas requiring licensure and continuing education, while Ph.D. students are prepared to pursue critical research into and analysis and interpretation of the human and natural worlds for the educational enterprise, government, and industry — anywhere serious advancement of knowledge of these worlds is sought and applied. Graduate students not only have a commitment to life-long learning, they embody that characteristic.

Situation:

Unemployment rates decrease dramatically as education levels increase. According to the Bureau of the Census, people with professional or doctorate degrees had an unemployment rate just over 1 percent in 2001 compared to 4.2 percent for high school graduates and a 7.3 percent rate for people with less than high school education.

Median earnings rise with education level. Full-time workers with master's degrees earned almost twice as

much as workers with only a high school diploma. Those with professional degrees earned over three times as much per year as high school graduates and paid almost \$20,000 per year more in total taxes. (2003 figures from *Education Pays 2004: The Benefits of Higher Education for Individuals and Society*, College Entrance Examination Board)

MSU Capacity:

- MSU enrolls approximately **3,000 doctoral students, 4,000 master's degree students, and 1,400 graduate/professional students** in a typical year.
- More than **3,000 teaching and research assistants contribute to the university's multiple missions** and have a major positive impact on research, undergraduate education, and outreach/engagement.
- Currently enrolled graduate students **range in age from 21 to 65** and **come from every state** in the United States and **from 130 other countries. Just less than half are Michigan residents, indicating MSU's national and international competitiveness.**
- **53 percent of doctoral students are male, 47 percent are female; 62 percent of master's degree students are female, 38 percent are male.** In the total graduate student population, **30 percent are international students and 17 percent are students of color.**
- **14 colleges offer graduate and graduate/professional programs:**
 - Agriculture and Natural Resources
 - Arts and Letters
 - The Eli Broad Graduate School of Management
 - Communication Arts and Sciences

- Education
 - Engineering,
 - Human Ecology
 - Human Medicine
 - Law
 - Natural Science
 - Nursing
 - Osteopathic Medicine
 - Social Science
 - Veterinary Medicine
- In addition to the Master of Arts, Master of Science, and Doctor of Philosophy degrees, **MSU offers 10 other graduate degree types:**
- Doctor of Musical Arts
 - Master of Fine Arts
 - Master of Arts for Teachers
 - Master of Public Administration
 - Educational Specialist
 - Professional Science Master
- The medical schools grant:
- Doctor of Human Medicine
 - Doctor of Osteopathic Medicine
 - Doctor of Veterinary Medicine
- The law school grants:
- Juris Doctor degree

Successes:

- **Over the past five years, MSU awarded 2,043 doctoral degrees.** Of those degree recipients, **more than 37 percent indicated an intention to stay in Michigan** and 84 percent indicated their intention to stay in the United States.
- MSU enrolls approximately **12 National Science Foundation Predoctoral fellows** each year, as well as

NIH Fellows, NIMH Fellows, EPA Star Fellows, USDA National Needs Fellows, and others.

- MSU doctoral students are actively engaged with their faculty mentors in many of the **Michigan Tri-Technology Corridor research projects** awarded to MSU faculty.

Innovations for Michigan's Future:

Along with solid masters and doctoral graduate programs that contribute to preparing the requisite leaders for the knowledge economy and graduate/professional programs across three fields of medicine plus law, **MSU is also engaged in innovations for the future of graduate education.**

One recent innovation in doctoral education is a specialization in environmental science and policy. This graduate program connects doctoral students and more than 100 faculty to both basic- and applied-research problems focused on the environment. More than that, the program introduces students in the sciences and engineering to the processes involved in making sound public policy, and likewise, helps students in the social sciences and humanities understand the complexities of the natural world and how scientists collaborate to provide the research that must underpin sound public policy.

Another innovation is a new kind of master's degree — the professional science master's (PSM) — designed for future managers who need to move comfortably between business and science. MSU began offering the PSM in 2002 and remains the only Michigan institution offering it.

A Ford Motor Company project manager who has a Ph.D. in mathematics predicts that **PSM graduates will be in high demand** and will make significant contributions to Ford and other industries. Small companies may have the greatest need for PSM graduates since they need both business and science expertise but may not be able to hire two people.

Companies are already taking advantage of the special skills of students pursuing the PSM. MSU students working toward the degree in zoo and aquarium management have done master's projects at

- Detroit Zoological Institute, Detroit
- Potter Park Zoo, Lansing
- The Oregon Zoo, Portland
- The North Carolina Zoo, Asheboro

MSU students working toward the PSM in industrial microbiology **held internships or did master's projects** at:

- Eli Lilly, Indianapolis
- Sigma Chemical Company, St. Louis
- Neogen, Lansing
- Abbot Laboratories, Chicago,
- Pfizer, Ann Arbor
- Pfizer, Kalamazoo
- U.S. Naval Research Laboratories, Washington, D.C.
- Nereus Pharmaceuticals, San Diego

MSU students working toward the PSM in industrial mathematics have **master's projects** at

- Delta Dental
- Intelligent Transportation Systems
- National Center for Food Safety and Toxicology
- Johnson Controls
- DaimlerChrysler
- Michigan Department of Transportation
- Ford Motor Company
- Sparrow Hospital
- General Motors
- AAA