



Ph.D. Programs

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Synopsis: Ph.D. programs support Gov. Rounds' 2010 initiatives to expand the state's scientific research infrastructure. University research is closely linked to Ph.D. programs. Faculty who generate research grants expect to have Ph.D. students working in their laboratories. Gov. Rounds recommended funding this year for three new doctoral-level programs: a Ph.D. in chemical and biological engineering at South Dakota School of Mines & Technology; a Ph.D. in pharmaceutical sciences at South Dakota State University; and a Ph.D. in materials chemistry at The University of South Dakota. These programs will support the 2010 research centers and help recruit outstanding research faculty who will contribute to the state's economic development.

University research productivity is linked to Ph.D. programs. Ph.D. programs and graduate assistantships are needed to recruit the faculty who can generate research grants, expand the state's research capacity, and contribute to economic development. The programs will contribute to the state's economic growth and support key policy initiatives:

Gov. Rounds' 2010 Education Initiative (<http://www.2010education.com>)

Goal 3C: Support postsecondary education programs designed to enhance the state's long-term economy.

- a. Double the number of Ph.D. programs.
- b. Double the number of Ph.D. graduates.
- c. Enhance Ph.D. program support infrastructure.
- d. Achieve the national average of people with graduate degrees, moving from 6.5 percent to 9.4 percent.

Gov. Rounds' 2010 Initiative (<http://www.2010initiative.com>)

Goal Three: Become a Recognized Leader in Research and Technology Development by 2010.

- 3B. Improve ranking to at least 30th nationally for National Science Foundation (research) funding.
- 3C. Develop research and technology infrastructure at our universities and with the private sector. (The emphasis is on research that can be commercialized and will benefit South Dakota.)

Ph.D. programs are an essential component of the state's research infrastructure:

- Faculty members expect to have advanced Ph.D. students available to work in their labs as graduate assistants.
- The new Ph.D. programs will help recruit exceptional faculty who can generate research grants. Without these programs the universities are at a disadvantage when recruiting faculty.
- The programs may help retain students who now leave the state to pursue these degrees.

The Board of Regents invited the public universities to propose new Ph.D. programs. The Ph.D. proposals were evaluated by external reviewers and approved by the board in December 2006. The board requests from the state about half of the resources needed to operate the new programs; the universities will provide the remainder from redirections and grants and contracts.

Universities & Programs	Legislative Request	University Share	Total
SDSM&T Chemical & Biological Engineering	\$754,500	\$754,561	\$1,509,061
SDSU Pharmaceutical Sciences	\$527,335	\$520,636	\$1,047,971
USD Materials Chemistry	\$508,222	\$508,009	\$1,016,231
Totals	\$1,790,057	\$1,783,206	\$3,573,263

SDSM&T Ph.D. in Chemical & Biological Engineering

The chemical and biological engineering program will focus on the education of graduate students in petrochemical and biochemical processing; bio-based energy sources, including biomass and biofuels; bio-based and bio-compatible materials; bioremediation; new energy sources; and polymer and composite materials and processing.

South Dakota is well positioned to play an important role in development of new bio-based technologies and value-added agricultural products. This Ph.D. program is aligned with the 2010 Center for Bioprocessing Research and Development at the South Dakota School of Mines and Technology and South Dakota State University.

SDSU Ph.D. in Pharmaceutical Sciences

The Ph.D. in pharmaceutical sciences is a graduate degree for persons planning careers as research scientists. (The Doctor of Pharmacy [Pharm.D.] program prepares pharmacists.)

The Ph.D. in pharmaceutical sciences program will train students in the area of drug discovery and delivery and pharmacogenomics research. Pharmacogenomics is the science of genetically-based individualized diagnosis and treatment of disease. The program will make SDSU more competitive when seeking federal and industry research support. Pharmacogenomics research, a new and high-priority area, will provide a special niche for the state. This program will contribute to the Governor's 2010 Initiative goal of becoming a recognized leader in research and technology development.

USD Ph.D. in Materials Chemistry

Materials chemistry involves the study of condensed phases of matter (solids, liquids, and polymers) and their interactions to understand the applications or potential applications of these materials. Because many materials have significant applications, there is a strong link between materials chemistry and technologies in the energy, nanoscience, engineering, biomedical, and other technology sectors. Materials chemists are employed by industry, federal agencies, research universities, and consulting firms. They may research materials for use in medicine and dentistry, develop biological and environmental sensors, and create new plastics and other polymers.

The materials chemistry program will build upon existing relationships with the 2010 Center for Research and Development of Light-Activated Materials and the 2010 Center for Accelerated Applications at the Nanoscale and in areas supported by the National Science Foundation, Department of Energy, and Department of Defense.