

Department of Physics

Strategic Plan: 2014-2019

MISSION *“The advancement of physics through excellence in research and the extension of the scientific heritage through education”*

VISION The Department of Physics will be committed to advancing its role within the university and the community by continuing to provide high quality education to all students and maintaining excellence in research. We will continue to emphasize our research efforts in the areas which will contribute to the university’s unique research standing and prominence as well as areas where our faculty is highly regarded for their expertise. Our research will provide a foundation for the best education for our students and give them unique opportunities to participate in scientific discoveries early in their career. We will engage our colleagues in the College of Sciences and other UL Lafayette Colleges in interdisciplinary projects to provide more benefits to our local community, to the State of Louisiana, and to the United States economy. Our department will be open to faculty and students of all world cultures and will create an environment in which our students will be prepared to be science ambassadors and educators throughout the world. The department has been and will continue to be dedicated to serving the regional and national demand for well-prepared graduates who are highly valued by employers, the community, and who are qualified to pursue advanced degrees. The physics component in the education of students from other departments is a priority. Great efforts will be channeled into creating innovative curricula to respond to their specific needs. We strive to provide to all our students an education experience built on the best teaching practices and technologies and to assure an interactive and stimulating learning environment in our classes.

The department aims to be highly ranked among our peer institutions and to be an essential part of the efforts in fulfilling the UL Lafayette strategic goals.

BACKGROUND

The Department of Physics has a long history of serving the Acadiana region, our state and the nation, through distinguished teaching, research, scholarship, and public service. The department consists of 7 full-time faculty and instructors, approximately 40 undergraduate majors, and 10 graduate students. The department, through its faculty, provides physics courses to non-majors as well as to Physics-majors, offering a Baccalaureate Science degree in Physics. At the graduate level, a Master's degree is offered with emphasis in applied, computational, and theoretical physics, as well as in geophysics, commensurate with faculty expertise. The Department of Physics, in partnership with the School of Geosciences, is also in the process of building an interdisciplinary PhD program that will focus on fundamental and applied research in the areas of Energy, Environment, and Earth Physics.

The courses Physics faculty teach focus on providing students from varied backgrounds with the tools and the motivation needed to achieve an understanding of the fundamental laws governing macroscopic and microscopic phenomena on Earth and beyond. The variety of classes we offer provide the students with a scientific awareness of the world around them, ultimately equipping them with the skills necessary to master critical thinking and the scientific-method. These strengths help them not only become better professionals but also make informed and educated decisions in all aspects of their lives. The department prides itself on the ability to provide students early in their professional careers with experience outside the traditional classroom through required research courses for undergraduates, as well as through an active external research seminar program. The undergraduate curriculum prepares students to enter graduate programs or to be competitive in the job market for government agencies, laboratories, industry, and academia.

Our department moved into a new era as recent retirements allowed us to hire excellent young faculty highly-regarded in their respective fields. We are the youngest department at the university with research expertise unique to other physics departments in Louisiana. This standing gives us unprecedented opportunities to meet the vision detailed in this strategic plan. Although we may come across challenges in getting the resources needed to implement all details in the plan, we are excited about our future: to participate in building the first interdisciplinary doctoral degree in the College of Sciences, to grow our student population, and to strengthen our research and education enterprise.

PHYSICS INITIATIVES IN SUPPORT OF THE COLLEGE TARGET GOALS, WITH ACTIONS FOR 2014-2019

I. ENHANCING RESEARCH EXCELLENCE

Strategies

- Maintain minimum "critical mass" in staffing levels required for productive high quality research and degree offerings, for preparing students for professional careers, and for assuring the success of the proposed collaborative doctoral program.
- Increase of the volume of externally funded research in the department.
 - Support faculty proposal initiatives through adjusting their teaching load based on active major funded projects.
 - Actively pursue collaborative funding with other departments.
 - Sponsor and encourage faculty participation in grant writing workshops.
- Create a framework for visiting students and scientists to increase national and international networking. Encourage proposals to obtain reliable and long-term funding sources for inviting and sending students from/to other academic institutions.
- Maintain a steady flux of quality research publications.
- Improve departmental research infrastructure through working with the College and University administration on developing and implementing a plan for Broussard Hall remodeling.
- Work with the Dean and the VP for Research to reestablish a Physics leadership at the Louisiana Accelerator Center (LAC), a key university and college interdisciplinary research facility, founded by the department.
 - Hire a new Physics faculty as Director of LAC.
 - Initiate multidisciplinary/multi-institutional research projects involving Physics faculty that will utilize the LAC facilities.
 - Encourage applications for external funding to support such projects.
- Enhance multi-disciplinary and multi-institutional research collaboration in faculty's expertise research areas.
- Increase quality and size of our M.S. graduate program.
 - Utilize the GRE services to target potential graduate students.
 - Work with the Graduate School to maintain funding for our teaching assistants and to advertise our program at professional conferences and through external seminars.
 - Form a departmental committee to evaluate and enhance the graduate curriculum.
 - Expand graduate course offerings through collaboration with other Physics departments in the state.
 - Develop at least one dual degree program with a foreign university.
 - Encourage faculty participation in conferences/workshops in Asia and Europe to personally recruit high-profile undergraduate students.

- Continue close collaboration with the School of Geosciences towards implementing the new interdisciplinary Ph.D. program.
- Maintain an active mentoring program for newly hired faculty members.

Progress metrics

- Number of new faculty hired
- Total research funding and funding per faculty member
- Number of departmental publications, number of publications per faculty member, number of publications including student
- Number of citations per faculty member
- Number of faculty recognitions for research excellence (NSF career awards, Professional Society Fellows, scientific journal editors, summer faculty research awards, UL Lafayette awards and professorships etc.)
- Number of interdisciplinary grants
- Number of joint and adjunct faculty appointments
- Amount of university funds allocated to utilities and infrastructure upgrades for the department
- Number of equipment proposals and grants, and associated funding levels

II. ENHANCING EDUCATION QUALITY

Strategies

- Modernize general and specialized physics teaching labs through STEP and external instrumentation improvement grants.
- Continue improving quality and delivery of shared course curricula (with SELU and UNO).
- Develop at least one high-quality service distance learning class (such as Astronomy 160/170).
- By the end of the five-year period develop at least one specific course for technical professionals in the evenings to meet the continuing education needs of the local community and industry.
- Increase enrollment in the B.S. program.
 - Work with the South Louisiana Community College to develop efficient Associate of Science Louisiana Transfer program in Physics
- Enhance opportunities for summer undergraduate and high-school research through seeking funding for a UL based REU program.
- Increase course offerings for summer semesters.
- Enhance graduate education with many of the initiatives outlined in Section I.
- Increase the use of media (wall-sized visualization systems, 3D monitors, and interactive feedback) to create a full immersion learning environment for students.

Progress metrics

- Feedback from students on the quality of instructions – departmental average SEIs compared to the college and university SEIs
- Number of external and internal awards and recognitions for excellence in teaching
- Number and amount of educational enhancement grants
- Number of curriculum development projects funded internally and externally
- Number of new courses developed at the graduate level
- Number of shared courses offered and received
- Departmental student credit hour production per faculty compared to other departments in the college
- Retention rate of undergraduate physics majors
- Number of graduates per year from undergraduate and graduate programs
- Number and percent of students earning bachelor's degrees who are seeking graduate or professional studies
- Number and percent of students earning bachelor's degrees who have accepted employment
- Number of graduate students supported by external grants and funding levels
- Number of faculty participations in teaching workshops and conferences

III. INCREASE VISIBILITY AND OUTREACH OF THE DEPARTMENT

Strategies

- Develop a plan and start regular fundraising efforts.
- Improve contact with alumni
- Form a departmental Advisory Board
- Maintain a high-quality up-to-date departmental website
- Establish ties with the regional and national business community through student sponsorships, industry research grants, regular contacts, and information exchange.
 - Connect with State and Federal organizations (e.g. USGS) to assess high risks and environmental problems that can be specifically tackled by the department (for example land collapses, landslides and tsunamis).
- Continue leadership in organizing the Science weekend and SMART festival and striving to make it an annually recurring event
- Offer at least one physics open house and one physics public lecture each year for the community and potential students
- Promote faculty success through the university's Office of Communications and Marketing and through the local media

Progress metrics

- Attendance at outreach events
- Number of presented outreach lectures
- Number of mentored school projects
- Number of disclosures, patents, and copyrights as compared to other departments in the college
- Number of students sponsored and hired by local industries
- Number of fundraising events
- Number of meetings with State and Federal authorities and sponsors to establish long term collaborations on geophysical and environmental issues in Louisiana
- Total amount of contributions to Physics Foundation accounts and Physics sponsored events