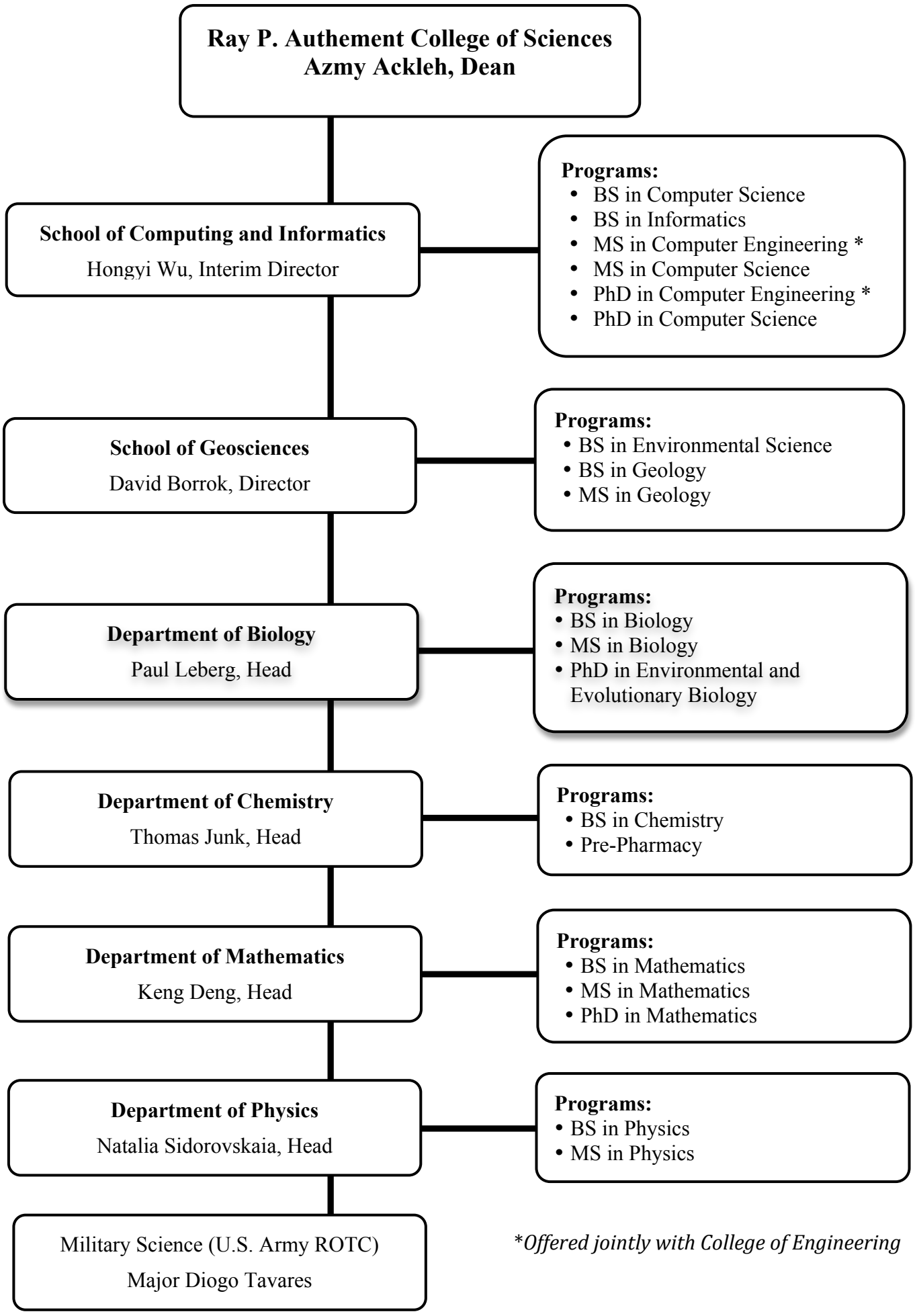
# STRATEGIC PLAN FOR THE RAY P. AUTHEMENT COLLEGE OF SCIENCES

**BACKGROUND:**

The University of Louisiana at Lafayette's Ray P. Authement College of Sciences consists of two schools (Computing and Informatics, and Geosciences) and four departments (Biology, Chemistry, Mathematics, and Physics). These units offer a total of eight B.S. degrees, six M.S. degrees, and four Ph.D. degrees (*see organizational chart below*). Total enrollment for Fall 2012 was 1729 undergraduate students, 131 M.S. students and 136 Ph.D. students. For comparison, Fall 2002 enrollment was 1265 undergraduates, 194 M.S. students and 121 Ph.D. students. The college attracts students from the Acadiana region and beyond; 2012 enrollment included students from 53 (out of 64) Louisiana parishes, 37 U.S. states, and 40 countries. The faculty consists of 41 full professors, 28 associate professors, 29 assistant professors and 25 instructors. While some faculty members' assignments have a large teaching component, other faculty members have a majority research function. Most of the professorial faculty (74%) hold both regular and graduate faculty appointments. Post-docs, research associates and technicians also contribute to the college's research mission. In 2012, external-funding awards totaled $6,434,149. For comparison, this total was $3,826,025 for 2002.


Ray P. Authement College of Sciences
Azmy Ackleh, Dean
School of Computing and Informatics
Hongyi Wu, Interim Director
Programs:
• BS in Computer Science
• BS in Informatics
• MS in Computer Engineering *
• MS in Computer Science
• PhD in Computer Engineering *
• PhD in Computer Science
School of Geosciences
David Borrok, Director
Programs:
• BS in Environmental Science
• BS in Geology
• MS in Geology
Department of Biology
Paul Leberg, Head
Programs:
• BS in Biology
• MS in Biology
• PhD in Environmental and Evolutionary Biology
Department of Chemistry
Thomas Junk, Head
Programs:
• BS in Chemistry
• Pre-Pharmacy
Department of Mathematics
Keng Deng, Head
Programs:
• BS in Mathematics
• MS in Mathematics
• PhD in Mathematics
Department of Physics
Natalia Sidorovskaia, Head
Programs:
• BS in Physics
• MS in Physics
Military Science (U.S. Army ROTC)
Major Diogo Tavares
*Offered jointly with College of Engineering

**THE VISION:** The RPA College of Sciences will emerge as a preeminent college of sciences in the Southeast and Gulf Coast region of the United States. The College will be recognized nationally for its innovative education, scholarly research activities addressing our nation's grand challenges, and for its diverse student body with exemplary academic achievements, leadership abilities, and global perspectives.

**OUR MISSION:** "*Science for our students, community, and society*"
Our mission is to serve our students, the citizens of Louisiana, the nation, and the world, through innovative and stimulating educational experiences and compelling research initiatives that create knowledge, deepen our basic understanding of the world around us, further economic development, and enhance quality of life. In support of our mission, The College of Sciences seeks to:

- Develop broad-thinking students into mature, ethical professionals, scientists, and researchers with the necessary creativity, critical thinking, and problem solving skills required to make significant contributions to industry, government, and the academic sector.
- Recruit and support top-notch teaching and research faculty engaged in scientific endeavors that are recognized nationally for their relevance and impact.
- Enrich scientific research and education through on-campus collaborations, multidisciplinary programs, large-scale multi-institution initiatives, as well as partnerships with government and industry.
- Foster scientific literacy within the University, the citizens of Louisiana, and the nation by providing stimulating courses for our students and by partnering with educators at the K-12 and community college level.
- Provide leadership in the translation and application of research into practical solutions that will benefit our local community, the state of Louisiana, our natural environment, industries of the Gulf Coast region, and society as a whole.

**TARGET AREAS:**

I. **Research Excellence**, with initiatives aimed at increasing research funding and publications. Initiatives are focused both directly on the research enterprise itself (e.g. by improving research infrastructure and enhancing collaborations across disciplines and institutions) and on the support provided by strengthening graduate education and enhancing undergraduate research.
II. **Education Quality**, with initiatives focused on various aspects of undergraduate and graduate education, including enhancement of capstone activities for undergraduates, enhancing recruitment of strong students, strengthening existing graduate programs and creating new ones.
III. **Visibility** and **Outreach**, with initiatives focused, among others, on strengthening ties with our alumni, increased focus on communication with our stakeholders, and on improving fundraising.

## INITIATIVES IN SUPPORT OF THE TARGET AREAS, WITH ACTIONS FOR 2013-2018

## TARGET I: ENHANCING RESEARCH EXCELLENCE

1. **Increase external funding of research in the college.** Specific initiatives aim to achieve this by, among others, improving our research infrastructure, enhancing our graduate programs and increasing collaboration on multi-disciplinary projects.
2. **Improve research infrastructure**.
    - College staff to work with university administration on developing a master plan for academic buildings, with goal of having up-to-date buildings and laboratories needed for competitiveness in grant funding, for collaboration with faculty at Tier 1 research universities, and for allowing research to be conducted safely and in compliance with all federal regulations.
    - College staff or college-wide committee to develop a plan for cyclical equipment upgrades/replacements. Plan to include assessment of needs and assessment of funding options (e.g., targeted fundraising, providing more incentives for applying for BoR Enhancement and other equipment grants).
    - Establish core facilities to provide instrumentation for research use across the college. Initial efforts to focus on a molecular biology – genomics - proteomics core facility and an environmental chemistry – geochemistry - environmental sciences core facility. Initial efforts also to address options for covering technician salary and maintenance / repair costs (e.g., user fees, monies generated from indirect costs returns).
    - Develop a plan for upgrading faculty/staff computers and software (including site licenses for programs essential for grant proposal preparation, data analysis and manuscript preparation).
3. **Increase size and quality of applicant pool for our graduate programs**.
    - Form a committee consisting of graduate coordinators of each graduate program in the college. Committee meets at least once per semester to discuss/evaluate/compare their methods used for graduate student recruitment.
    - Work with graduate school to increase funding for advertising and on-campus visits for potential students.
    - Work with graduate school towards providing competitive stipends for teaching assistants and University fellows.
    - For programs for which a target of increased enrollment from our undergraduate programs is appropriate, investigate potential for dual undergraduate/graduate enrollment (see also under I.1 above).
4. **Increase the number of graduate programs.**
    - College staff and college-wide committee to study potential for new MS and PhD programs in the college. Initial efforts to include focus on an interdisciplinary PhD in Geosciences/Physics, an MS degree in chemistry, and the potential for additional PhD programs in interdisciplinary areas.
5. **Re-invigorate established Ph.D. programs.** Established graduate programs have lost research-active faculty, in part due to retirements and heavier reliance on instructors to accommodate growth in undergraduate enrollment.
    - Develop a plan to return these programs to original target numbers for research-active faculty.

6. **Enhance multi-disciplinary collaboration among college faculty.**
    - Increase information flow within the college (e.g. college newsletter, more frequent college-wide events).
    - Optimize college web site and ensure that departments/school web sites have easily-accessible information on faculty research areas.
    - Review administrative systems and processes (including tenure review, annual evaluations) with an eye on making modifications that would encourage interdisciplinary collaborations.
    - Investigate the use of active approaches (such as use of the Delphi method) to exchange ideas and promote collaboration on multidisciplinary projects and grant proposals.
    - Establish mechanism for college-wide seminars on interdisciplinary topics, such as regularly sponsoring a nationally prominent, interdisciplinary scientist for a college-wide seminar or initiating a college-level colloquium series with speakers working on interdisciplinary research topics.
    - Investigate the potential for using existing university centers and institutes for organizing and catalyzing interdisciplinary research initiatives.
7. **Increase faculty and graduate student access to scientific journals.**
    - Work with the library to encourage a transition to one with a primary focus on providing online access to serials.
    - Work with university administration and library to investigate potential for establishing a pool with other UL System Universities.
8. **Increase the number of graduate fellowships in the college**.
    - Provide incentives for PIs to apply for BoR PhD Fellowship and BoR MS Fellowship grants. Promote discussion and information exchange among PIs on existing BoRGF grants and PIs on proposals that did not receive funding.
    - Investigate potential for fundraising targeted at graduate fellowships.
9. **Enhance funding for graduate student research and support.** Including:
    - Investigate potential for graduate student research funding via "crowdfunding". If this looks promising, work with graduate school and research office on organizing a crowdfunding workshop for grad students.
    - Work toward formalizing funding mechanisms (outside traditional grant and contract mechanisms) whereby industry or businesses can support student "apprenticeships".
10. **Introduce incentives to encourage funding graduate students as research assistants** on grants and contracts.
    - Investigate means of incentivizing faculty investigators to fund students from grants, including high weights for annual evaluation rubric scores related to such funding, and providing "in-kind" tuition waivers for some students supported as graduate research assistants.
11. **Enhance mentoring of new research-active faculty members.**
    - College staff or college-wide committee to assist departments with mentoring of new research-active faculty members.

## TARGET II: ENHANCING EDUCATION QUALITY

1. **Increase opportunities for undergraduate research, internships, or other capstone experiences**.
    - Conduct an inventory of existing opportunities within the college, and determine what can be done to increase opportunities (e.g. incentives for participating faculty and students).
    - Advertise these opportunities on the college website for recruiting purposes but also to increase collaboration across departments (e.g. chemistry majors involved in biological research or biology majors involved in biomathematics research) and promote interdisciplinary projects.
    - Establish an undergraduate research experience program that can serve both as capstone experience and can be used to transition our undergraduates into our graduate programs (for graduate programs that benefit from increase in local recruitment).
    - If funding is available, develop a COS office for undergraduate research. This office would coordinate undergraduate research on campus and provide COS-wide professional development opportunities for undergraduate student researchers. The office would also track undergraduate researcher numbers and outcomes.
2. **Increase capacity for courses that form "bottlenecks" towards student graduation**.
    - School directors and department heads identify bottlenecks and meet to discuss and implement approaches best suited to remove the bottlenecks. Solutions could include an increase in manpower (e.g., additional graduate teaching assistants, additional instructors, use of undergraduate seniors on work study) or scheduling of courses outside traditional hours (when space is limiting factor).
3. **Enhance recruitment of strong students into our undergraduate programs.**
    - Increase college involvement in regional Science Fairs, Science Olympiad, Louisiana Computer Programming Classic, etc. This could be reflected in giving out a special College of Sciences overall award. The college staff will work with the Office of Undergraduate Admissions & Recruitment to ensure follow-up (application packets sent out participants).
    - Set up a college-wide committee to work with Office of Undergraduate Admissions & Recruitment to increase visibility of college during recruiting efforts and to enhance enrollment in sciences. This committee is to assist the Office of Undergraduate Admissions & Recruitment in evaluating innovative recruiting techniques (such as predictive modeling tools that use past enrollment data to predict an institution's prospective students in terms of likelihood to enroll). The committee is also to assist the Office of Undergraduate Admissions & Recruitment Office in enlisting faculty members and possibly graduate students with task of exciting prospective students at targeted high schools.
    - Coordinate efforts (within the college and with efforts at the university level) towards dual enrollment of qualified high school students into freshman classes.
    - Form a committee to assist with coordination and to look into availability of STEM grants (to attract more students or to possibly fund extra summer courses).

4. **Enhance mentoring of new faculty members, and promote adoption, among established faculty, of new didactical approaches and methods.**
    - College staff or college-wide committee to assist departments with mentoring of new faculty members.
    - College (in collaboration with university) to investigate what can be done as far as incentives for faculty to adopt effective didactical approaches, and to provide training opportunities.
5. **Investigate the potential for offering certificates** in areas with a strong employment potential and not covered by our existing programs.
6. **Enhance graduate education** with many of the initiatives that are targeted towards both graduate programs and research excellence (see Target I above).

## TARGET III: INCREASING VISIBILITY AND OUTREACH

1. **Enhance fundraising in the college.** Establish a college-wide committee on fundraising, to allow for exchange of ideas and best practices among departments. Committee should also coordinate with university-level efforts, and those by the UL Foundation.
2. **Improve contact with alumni via newsletter and social media**.
3. **Enhance promotion of the college and its units**. College (with input from departments) to coordinate with efforts at the university level on promoting the brand name of the College of Sciences and units within the college.
4. **Advertise the strength of our programs** and opportunities for hands-on learning and student research.
5. **Establish an external college advisory board** (with community leaders, industry representatives, alumni, etc.) to advise the college with respect to long-term planning.
6. **Investigate and try out options for establishing business ties.** Conducting workshops and open-house events are some of the potential options.
7. **Provide "news releases" on faculty and student research, accomplishments**, etc. to the university Office of Communications and Marketing.
    - Provide college-level assistance with newsletter content, soliciting news from department heads and directors on a regular basis, and serving as contact for the university Office of Communications and Marketing.