CURRICULUM VITA

CAROL L. STRONG

Personal Data

- Business Address:Department of Physics, OB 201, UAHuntsville, Huntsville, AL 35899

Education

- Bachelor of Science, Bachelor of Arts, 1982, University of West Florida, Pensacola, FL
  Major field-of-study: Physics
  Major field-of-study: Mathematics
- Master of Science, 1988, University of Alabama in Huntsville, Huntsville, AL
  Major field-of-study: Physics
- Doctor of Philosophy, 1994, University of Alabama in Huntsville, Huntsville, AL
  Major field-of-study: Physics
  Dissertation: *Development of a Spaceworthy Faraday Rotation Ammeter for Plasma Current Measurements*

Professional Employment

Non-Academic

- Engineer II, 1983-1987, Northrop Corporation, Electro-Mechanical Division, Anaheim, CA

Academic before Ph.D.

- High School Teacher, 1982-1983, Pensacola School of Liberal Arts, Pensacola, Florida
- Adjunct Instructor, 1983, Pensacola Junior College, Pensacola, FL
- T.A./High School Teacher, 1986-1987, UAHuntsville and Butler High School, Huntsville, AL
- Research Assistant, 1987-1990, University of Alabama in Huntsville, Huntsville, AL 35899
- Research Assistant, 1990-1994, University of New Hampshire, Durham, NH

Academic since Ph.D.

- Lecturer, 1993-present, University of Alabama in Huntsville, Huntsville, AL 35899

TEACHING
ACCOMPLISHMENTS & HIGHLIGHTS

Executive Summary

When I first began teaching here at UAH, I was assigned all introductory courses such as Exploring the Cosmos I & II and the General Physics with Calculus I, II, & III series. It has taken a number of years, but my skills at teaching have now been recognized by five successive Physics Department Chairmen, two successive Deans, various student organizations and literally thousands of students. Along with this recognition has come the opportunity to teach a wide variety of upper- and lower-level courses both in and outside of my forte, plus a course geared to teaching teachers how to teach science using inquiry. I am one of the few in this department with experience teaching so many of the core curriculum courses and a number of the specialty courses.

I am very happy to have been allowed to teach such a wide variety of subjects to so many interesting students. I like the challenge of teaching a new or difficult course, setting up lectures, working example and homework problems, identifying difficult subject areas and presenting demonstrations. I also like the challenge of teaching a course that I know very well, since I must constantly work to keep the subject fresh for myself and for the students alike.

Statement of Teaching Philosophy

My teaching philosophy hinges, as it must, on the student. The student must want to learn or nothing I do in or out of class will make any difference.

Barring any desire for failure, I find I can teach any student that wants to learn. As a teacher, my biggest job is to figure out how that student learns and teach the subject in that fashion. Some may learn by hearing me discuss a concept, others by watching a demonstration, still others purely by presentation of mathematical formulations and others just need to see a concept presented multiple times in multiple ways. Since, in a large group of students, all types of learning will be represented, I must present material in ways geared to multiple learning styles so that I connect to the entire group. I must also be amenable to answering questions, possibly simply restating what was just presented as an answer, in order to fill learning needs that I didn't anticipate.

In my large lecture classes, it is very difficult to fulfill every student's learning need. I try to take advantage of several "tricks" to help.

1. I use demonstrations and simulations to illustrate physical concepts.
2. I require students to work with me in class to solve example problems from the book.
3. I therefore allow discussion during their "clicker quizzes" as these quizzes promote serious participation.
4. I do not use power point presentations. I lecture "skeletons" on CANVAS and modify these in class using a digital Interwrite SchoolPad and "chalk talk" style. The students get to see diagrams directly from the book, but modified by me as we talk.
5. I cover in detail the theory in the text that I believe is difficult for most students to grasp by purely following the mathematical formulations, but I usually combine this theory into working a problem which seems to cement the concepts best.

With these tricks, students are actively involved in the lecture and, therefore, they have a vested interest in the material presented.

Finally, I find that, even with all of my classroom tricks, there are still students that have difficulty absorbing concepts and relating those concepts to problem solving. I believe that one of my strongest attributes is that of availability. I have a large number of office hours open to my students along with our own Physics Success Center. There is no reason that a student can't get needed help in my courses.

Teaching Awards & Honors

- Nomination for the CASE U.S. Professor of the Year, 2002 and 2003
- SGA Most Outstanding Faculty Award, College of Science, 1996, 2001-2, 2002-3, 2003-4, and 2005-2006
- Who's Who Among America's Teachers, nominated by Dustin Nix, 2004
- Who's Who Among America's Teachers, nominated by Holly L. Searcy, 2005
- Alpha Lambda Delta Professor of the Year, 2005, book placed in library
- Member Alpha Lambda Delta, 4/2/06
- Member Omicron Delta Kappa, 10/08
- Teaching Excellence Award, College of Science, 2010, $500
- Society of Physics Students award for "Best Damn Physics Teacher", 2012
- Teaching Excellence Award, College of Science, 2014

Courses Taught

Over the last twenty years, I have taught all but a select few of the core undergraduate physics courses and several of those in the specialties. I have listed these courses and titles with the number of semesters below. I did not specify SIE scores for any given course, but no scores fell below a 90 and most were above 95. I also did not indicate the edition of the text used in the course, as the editions changed while I was still teaching the course; suffice it to say that I used the current edition for that year.

AST106 Exploring the Cosmos, 6 semesters; **AST107** Exploring the Cosmos II, 5 semesters; **PH110** Frontiers in Science, 7 semesters; **PH111** General Physics with Calculus I, 24 semesters; **PH111 Studio**, 1 semester; **PH112** General Physics with Calculus II, 23 semesters; **PH113** General Physics with Calculus III, 7 semesters; **PH205** Mathematical Methods for Physicists, 2 semesters; **PH305** Mathematical Methods for Physicists, 7 semesters; **OPT341** Geometrical Optics and **OPT342** Physical Optics, 2 semesters each; **PH337** Electronics, 10 semesters; **PH301** Intermediate Mechanics, 14 semesters; **PH431** Introductory Electricity and Magnetism I, 4 semesters; **PH432** Introductory Electricity and Magnetism II, 1 semester; **BYS491** Inquiry-Based Science, 3 semesters; **PH499** Pracitcum Mentor for William Christopher West, 1 semesters.

Graduate Students Supervised

- **Amy Bandas**, Master's Thesis Committee, "*EUV and Soft X-Rays from Active Galactic Nuclei (AGN)*", M.S. Physics (2001)
- **Christina Sharp**, JUMP student, worked for me in support of my PH337 Electronics class, Summer/Fall, 2017. Christina spent the summer semester going over all student experiments for the fall semester. She replaced 3 experiments completely, organized presentation of all other 13 experiments to make their format the same and determined what materials were needed to complete each experiment. She placed material orders and finalized organization of student kits. For the 3 replaced experiments, she researched online and then tested all 3 with new materials to make sure the students wouldn't have any problems running the experiments.
  During the fall semester, Christina joined me in class during the experiment activities every session. She was invaluable helping students that were having only mild difficulties with experiments while I helped those that were having deeper problems. She also graded all homework, entering grades on Canvas for me.

Advising Activities

The Department of Physics requires each physics student to meet with an advisor every semester. With this policy, we find very few of our students do not have the required courses and GPA's for graduation; our students are introduced to possible curriculum choices they may not have considered on their own; and many of our students take far more physics courses than are actually required by our flexible curriculum.

Although I have some help on occasion (particularly after my stroke in spring '08) from Drs. D. Gregory, R. Miller and A. Elsamadicy, I am the central advisor for all undergraduate students. I have seen as few as 20 students and as many as 120 students in a semester. My duties to these students include, but are not limited to:

- Advisor for all physics undergraduate students (50-120 students), including those with specialties in optics, applied/theoretical, astrophysics, engineering, environmental/atmospheric science and secondary education. I meet with each student at least each semester to check on curriculum status, determine registration needs, sign course repeat and Pass/Fail forms and, on occasion, suggest help from the University Counseling Center and Student Career Development Services.

- Create/Modify Program of Study for each physics undergraduate student upon designation of physics as major or minor.
- Prepare appropriate engineering cognates for Physics with Engineering students, although these are rare.
- Create Program of Study changes as necessary.
- Monitor graduation audits of all physics undergraduate students.
- Perform BANNER overrides for undergraduate priority and normal registration as necessary. Although I am rarely teaching the entire summer, I also do advisement in summer as needed.

Curriculum & Program Development

I have been the lead advisor in the physics department for my twenty five years and have, therefore, been involved in many curriculum and program changes. Listed below are some of those chances with minor details.

1. **Cognate and Specialization Curricula for MAE, ME and EE, 2009-11 catalog**
2. **Online Program of Study Forms**
3. **Technology Development, PH101-113**
4. **Astrophysics Curriculum (2007-9, 2009-11 catalogs)**
5. **Advisement/Curriculum Committees, multiple years**
6. **Studio Physics design and implementation**
7. **Online Homework course administrator, PH101-113**

Educational Related Proposals and Student Research Recommendations

Every semester, I write recommendations for a large number of students from my courses. Although not all of these students receive the scholarships and internships that they would like, and some don't tell me what they do receive, here are some examples of the results for the last 8 years.

"**Implementation of Tutorials in Large Introductory Physics Courses, A Step Toward Studio Physics**", **Co-Invesitgator** with Abdalla M. Elsamadicy, Mini Grant $10,199.00, 2005

UAH REU support for physics students: Lisa Kodgis, Andrew Sims, Carl Blaksley, Ross Cortez, Summer 2006

"**High Temperature Multi-layer Ceramic Composite Coatings**", **Co-Investigator** with Abdalla M. Elsamadicy and in collaboration Alabama A&M. Poster published by student supported, Andrew Sims, "*Characterization of W_1C_X Electrical Contacts on Silicon Carbide using RBS Channeling and Raman Spectroscopy"*, Fall 2006

"**Peer Tutoring in 1st Year Physics Courses**", **Co-Investigator** with Abdalla M. Elsamadicy, $3200, Fall 2006

Alabama Space Grant Scholars, Recommendation, $1000 @ for Lisa Kodgis and Simon Porter, Ashley Campbell, Christian Bonnell, Academic year 2006-2010

Delta Zeta Scholarship, Recommendation, $1000/yr. for Ashley Campbell, Academic year 2009

Universities Space Research Association, Recommendation, $1000/yr. for Ashley Campbell, Academic year 2009 and $9000 for William Christopher West, 1/18-7/29/2012, plus continuing work at $12/hour

SCI systems Inc. / Olin B. King Scholarship, Recommendation, $4000/yr. for Ashley Campbell, Academic year 2009

UAHuntsville Alumni Association Scholarship, Recommendation, $3000/yr. for Ashley Campbell, Academic year 2009

Professor Elmer E. Anderson Scholarship, Recommendation, $1000/yr. for Ashley Campbell, Academic year 2009
Goldwater Scholarship Nominee for UAHuntsville, Recommendation for Christian Bonnell, Academic year 2009-2010
Seyfert Price Fellowship, Case Western, Recommendation, $4800 stipend and 10 wk. fellowship for Lauren Kahre, Academic year 2010-2011
NCMR Scholars Program Grant, Recommendation, $10,000 for Lauren Kahre, Academic years 2009-2011 and 2010-2011
Science and Engineering Scholarship from Von Braun Astronomical Society, Recommendation, $3000 for Eric Zirnstein, Academic year 2010-2011
HASBAT Scholarship, Recommendation, $1500 for Akito Kawamura, Academic year 2010-2011

Service to the Department

- 1997-present: Advisor, all undergraduate physics students
- 1997-2008, 2013-present: Chairman, Undergraduate Curriculum Committee; Present: Member Undergraduate Curriculum Committee
- 2004-2010, 2013-present: Chairman, Teaching Assignments Committee; Present: Consultant for Teaching Assignments
- 2004-present: Course Administrator, WileyPlus online homework for PH111-113 and PH101-102
- Spring, 2004, 2007, 2009, 2013: Re-writes of undergraduate 2005-2007, 2007-2009, 2009-2011 and 2011-2013 catalogs
- Summer 2004: Member, SACS Accreditation Committee
- Summer 2005- 2008: Member, Strategic Planning Committee
- Fall, 2006-2008: Chairman, Studio Physics Committee
- Fall, 2006: Evaluation of part-time instructors; Present: Available as needed
- Summer, 2006: Member, Minority Undergraduate Recruitment Committee – working with several others to try to get funds for recruitment of minority and non-minority undergraduate students
- Summer, 2012: Support for substitute instructors
- Fall, 2012: Provided answers to outreach questions that are most asked by visiting students about UAHuntsville and Physics. These answers were compiled to modify the Physics Department's brochures
- Fall, 2012: Represented Physics department to the national (NCATE) and state (ALSDE) accreditation team visiting UAHuntsville to determine Education accreditation.
- Fall, 2012 and Spring, 2013: Supporting Brittani Searcy, a Space Grant Student, with Outreach to a Title 1 school, Brookhaven Elementary in Decatur, AL. Providing lesson plans for a visit day along with materials for experiments (Meteors and meteorite collection) and will join her on that day for the presentation and experiments.
- Fall, 2015: Graduate Student Seminar Speaker, Physics Department, "Engaging Students in the Lab/Classroom/Workshop"
- Fall, 2015: Evaluation of Dr. Ed Rush, PH431-01 professor; co-evaluator was Dr. Don Gregory
- Fall, 2015: Speaker for Frontiers in Science – "How to Survive Undergraduate School", "Nature Optics"
- Spring, 2016: Instructed Physics TA graduate students on how to set up rubrics and file submission instructions for their PH101/102, PH114-116 laboratory students. The TA's were ecstatic and have continued to pass their knowledge on to the next generation TA's. Advantages? Lab students don't have to pay to print out multiple pages at 10 cents a page on UAH printers. No more paper grading of lab results by TA's!! Grade applied to work is immediately visible to students in Canvas.

Service to the College

- Summers, 2005-2007: Teamed Instructor for BYS 491 Special Topics in Biological Sciences, The Physics of Light; $40,000 grant by The Boeing Corporation.

- Fall, 2006-Spring, 2009: Member, College of Science Academic Facilities Committee
- Summer, 2012: Supported the viewing of the transit of Venus across the Sun on 6/5/12 by running one of 7 scopes and discussing the view with the visitors.

Service to the University

- Fall, 2004: UAHuntsville Foundation Distinguished Teacher Award Lecture Series – presented "*Engaging Students in the Learning Process*"
- Summer, 2006, 2007: Member, Meet the Faculty Panel – Met with incoming freshmen during orientation.
- Summer, 2012: Appointed Member of Honors Faculty
- Fall, 2014: Coffee Cup Chat Series, Charger Village Lobby – I met with a variety of students to talk about anything that interested them. The idea of the coffee chat was for students to get personal face time with a professor outside of any classroom or office situation – to find out what hobbies they have, what life experiences shaped them, places they've lived or visited, what makes them laugh, etc.
- Spring, 2015: Part of the GTA Lecture Series, "Engaging Students in the Lab/Classroom/Workshop". Since I was awarded the Foundation Award for Distinguished Teaching and the College of Science Distinguished Teaching Award each within one year, and both for the second time, I was requested to give a lecture to GTA's about engaging students so that they are a fully effective GTA.
- Spring, 2015: Served on the Faculty Awards Committee to determine Foundation Award recipients for Excellence in Teaching and Research.
- Fall, 2015: Honors Contracts for Breanna Crane and Kareem Omar in PH337-01. Students were required to re-vamp one course experiment, build and present a digital project and make a presentation about something that they had worked on in the sciences to the class.
- Spring 2016: ARISS radio contact, Space Hardware Club. Provided demonstrations for the ARISS team to take to the elementary schools to present various aspects of physics.
- Summer, 2016: Scholars Institute 2016, The UA System, Joined with Dr. Mary Setzer presenting different polling styles for use during class sessions.
- Summer, 2016: Program review for the Office of Disability Support Services. Invited by Dr. Sundar Christopher to represent our College expressing insight and experiences to the committee.

Service to the Professional Community

- March, 2005: Von Braun Astronomical Society – "*Nature Optics*"
- Summers 2005-2009: Workshops for *Exploring Space, the Classroom Connection* – sponsored by U.S. Space and Rocket Center, UAHUNTSVILLE and Marshall Space Flight Center. "*Light Spectra, Waves and Astrophysics*", "*Light Spectra, Waves and Astrophysics: Observations and Measurements*", "*Asteroids, Meteors and Micrometeorites: Observations and Measurements*", "*Light: Geometric Attributes, Pinhole Viewers and Telescopes*". @ $300 Honorarium
- Summers 2009 and 2010: Society of Women Engineers (SWE) North Alabama (NAL) section Volunteer. Panelist and speaker to teachers and parents interested in guiding their female students and daughters into science related fields.