

USG Physics and Astronomy Academic Advisory Committee (PAAAC)

Minutes of April 26, 2013 Teleconference Meeting

The meeting was convened at 3:30pm with a quorum of 15 out of 31 institutions.

Attending: Andy Hauger, chairperson (Georgia Regents University), Shawn Seat (Abraham Baldwin Agricultural College), K. C. Chan (Albany State University), Leon Jaynes (Armstrong Atlantic State University), Tatiana Krivosheev (Clayton State University), Kimberly Shaw (Columbus State University), Emma Cooley (Dalton State College), Michael J. Pangia (Georgia College & State University), Jim Guinn (Georgia Perimeter College), Brian Thomas (Georgia State University), Malav Shah (Macon State College), Nikolaos Kidonakis for Ted LaRosa (Kennesaw State University), Charles W. Johnson (South Georgia College), , William Dennis (University of Georgia), Bob Powell (University of West Georgia).

Minutes taken by Andy Hauger.

- 1) A welcome was given by committee chair Andy Hauger from Georgia Regents University.
- 2) The April 27, 2012 meeting minutes were considered and approved as written.
- 3) The election of officers was then discussed. Chad Davies (Gordon State University) will be chair for 2013 – 2014. Then Jim Guinn (Georgia Perimeter College) was nominated and elected for the position of Chair-Elect for next year.
- 4) The election of officers raised the issue of the potential need for changes in the PAAAC bylaws (see http://www.usg.edu/academic_planning/committees/view/physics_and_astronomy) which currently divides our members into three categories: two-year and state colleges, state universities, and regional/research universities. The current practice calls for annual rotation of representatives from each group. With recent consolidation of several universities and colleges and few two-year college representatives, it was suggested that the PAAAC consider updating the appropriate bylaws. A subcommittee was formed to study this issue and to report back by the end of the 2013 calendar year. The subcommittee consists of the following members: Chan (Albany State University), Emma Cooley (Dalton State College), and), Jim Guinn (Georgia Perimeter College). Andy Hauger agreed to send a link with the existing bylaws to each subcommittee member.
- 5) As suggested by **Dr. Felita Williams**, Assistant Vice Chancellor for Academic Planning at the USG, there was discussion of tracking student success in the USG after taking introductory physics in the TSUSG. Several suggestions of tracking in Banner and/or Degree Works were made, however, more refined questions are necessary to generate useful data.
- 6) There was discussion on the general topic of increasing physics graduates and specifically increasing numbers of physics graduates who intend or are trained to work as secondary teachers. Many programs were mentioned including the NSF funded Noyce programs at Georgia Regents University, University of West Georgia, Columbus State University, Armstrong Atlantic University

and Georgia State University. Several programs mentioned increasing numbers of expected graduates in these targeted areas. Other examples of model programs include the UTeach program which offers the BS degree in physics (with certification) but requires matching funds. Some general comments about increasing enrollments and degree production in physics through increased opportunities for undergraduate research and other characteristics featured in the document SPIN-UP (Strategic Programs for Innovations in Undergraduate Physics Programs, <http://www.aapt.org/Programs/projects/spinup/>) published by the American Association of Physics Teachers (AAPT) in 2010.

Barriers to physics degree production included deficient mathematics preparation.

7) There was discussion of the use of laboratory fees for paying laboratory assistants. Many programs use such funds for purchase of consumables or laboratory equipment. However, each university must have BOR approval and so individual programs will have different limitations.

8) The next meeting will occur in early April 2014.

9) The meeting was adjourned.

Learning Outcomes for Area F for Physics Majors

Calculus Sequence

1. Students will apply methods of integration and differentiation in one variable to solve problems. (Calc I)
2. Students will apply advanced integration techniques, Taylor's theorem, the general binomial theorem to solve problems. (Calc II)
3. Students will use double and triple integration, partial derivatives and vector-valued functions to solve problems. (Calc III)

Phys 2211

1. Analyze and solve kinematical problems for systems moving in one and two dimensions using pictorial, graphical, physical, or mathematical representations (including calculus and vectors) of the system, and other representations as appropriate.
2. Analyze and solve statics and dynamics problems using Newton's laws in one and two dimensions using multiple representations including free-body diagrams and mathematical descriptions (including calculus and vectors) of the system.
3. Analyze and apply the conservation laws (energy and momentum) for linear and rotational systems, and develop solutions using multiple representations, including pictorial, graphical, or mathematical (including calculus and vectors) descriptions as appropriate.

PHYS2212

4. Analyze and solve electrostatic problems for discrete and continuous charge distributions using pictorial, graphical, physical, or mathematical representations (including calculus and vectors), and other representations as appropriate.
5. Analyze and solve magnetostatics and induction problems using pictorial, graphical, physical, or mathematical representations (including calculus and vectors), and other representations as appropriate.
6. Analyze and solve DC and AC circuit problems using pictorial, graphical, physical, or mathematical representations (including calculus and phasors), and other representations as appropriate.

Laboratory

1. Students will collect appropriate data using available technologies (including lab equipment and computer interfaces, as well as simulations) to draw logical and physically reasonable conclusions.