

DATE: May 11, 2017

SUBJECT: New Academic Program
Austin Peay State University
Engineering Physics, Bachelor of Science
(CIP 14.1201--Engineering Physics)

ACTION RECOMMENDED: Approval

PROGRAM DESCRIPTION

Engineering Physics is the interdisciplinary study of physics, mathematics, and engineering with a particular emphasis on developing advanced techniques to solve complex, real-world problems. The proposed Engineering Physics BS program at Austin Peay State University will prepare graduates to apply new technologies to problems in engineering design and manufacturing where established mechanical or electrical engineering approaches are inadequate. Program graduates will be eligible to take the professional engineer licensure exam.

The proposed Engineering Physics program will share much of the existing Physics program’s major core, but will differ from the Physics BS program by a minimum of 20 credit hours. The addition of the Engineering Physics program offerings in the Department of Physics and Astronomy will leverage existing resources and capability to expand the department’s success in producing graduates. Physics at APSU has a reputation as a strong department and program in the state.

INSTITUTIONAL GOVERNING BOARD APPROVAL

The proposed Engineering Physics BS program was approved by the APSU Board of Trustees on March 30, 2017.

PROPOSED IMPLEMENTATION DATE

Fall 2017

RELEVANCE TO INSTITUTIONAL MISSION AND STRATEGIC PLAN

Austin Peay State University is a comprehensive university committed to raising the educational attainment of the citizenry, developing programs and services that address regional needs, and providing collaborative opportunities that connect university expertise with private and public resources. The degree program in Engineering Physics fits well with the overall mission of APSU and supports the Governor’s Drive to 55 program. Austin Peay State University is committed to raising the educational attainment and supporting the workforce needs within Tennessee and especially in the greater Clarksville-Ft. Campbell region.

CURRICULUM

The curriculum for the proposed Engineering Physics BS program is modeled after the program at Murray State University in Murray, Kentucky. Murray State is similar to APSU in that it is a comprehensive regional state institution which offers both accredited engineering technology and engineering physics programs. APSU will seek accreditation for the Engineering Physics program from the Accrediting Board for Engineering and Technology (ABET).

The program will require completion of 120 credit hours of which 74 credit hours are STEM courses. Students will have an opportunity to conduct research and have internship experiences with local industry partners.

PROGRAM PRODUCTIVITY

Enrollment projections were benchmarked upon enrollments in their current physics program and Murray State's engineering physics program.

	2017	2018	2019	2020	2021
Enrollment	15	28	45	57	61
Graduates	--	--	--	8	10

PROGRAM DUPLICATION

No other public college or university in Tennessee offers a similar degree. Belmont University offers an Engineering Physics degree, though it is not currently ABET accredited.

EXTERNAL JUDGMENT

On December 12, 2016, Dr. Harold T. Evensen, Professor of Engineering Physics at University of Wisconsin-Platteville conducted a campus visit to evaluate the proposed program. His written report recommended approval stating, "The proposed program ...fills needs for both students and employers...builds on existing knowledge and infrastructure associated with a successful Physics program with an emphasis on applied physics...faculty includes members with industry experience and one with Professional Engineer license who is charged with developing the critical capstone."

STUDENT DEMAND

Using Murray State's engineering physics program and APSU's physics program as benchmarks for enrollment; Murray State's current three year average enrollment is 89 with 12 graduates annually. The existing Physics program at APSU averages 20 incoming majors each fall with 9 graduates annually. Annually, APSU receives multiple inquiries from students interested in engineering applications programs. Additionally, the Department of Physics and Astronomy recruits heavily from the Governor's School for Computational Physics and many of these high-achieving scholars will be interested in engineering-related fields.

OPPORTUNITIES FOR PROGRAM GRADUATES

The Engineering Physics program is designed to serve the workforce needs of the local region and the state. The availability of engineering education graduates as opposed to a technology or science degree is a significant consideration when attracting new manufacturing industry to the state. In the last several years, the Clarksville-Montgomery County Industrial Development Board, in conjunction with local and state governments, has been successful at attracting a large manufacturing presence in Clarksville. APSU surveyed these industries which represented both a regional and national presence. The companies clearly verified the presence of employment opportunities for graduates in engineering physics and the commitment of representatives of these industries to serve on an advisory board as well as letters of support for the proposed programs demonstrate evidence of their interest in its development.

INSTITUTIONAL CAPACITY TO DELIVER THE PROGRAM

The addition of the Engineering Physics BS program to APSU's Department of Physics and Astronomy will allow for efficient use of resources. The department has availability capacity in many of the courses that will be common between the physics and engineering physics programs. It is expected that due to program growth, a new tenure track faculty will be hired in year three. Existing library and information technology resources are adequate with a one-time expenditure request to expand databases for physics and engineering. Other one-time expenditures include equipment purchases of \$150,000 over a three-year period to align with upper-division coursework and \$20,000 for accreditation.

The Chemical Engineering Technology AAS program (located within the Department of Physics and Astronomy) has recently been terminated and the resources will be reallocated to this proposed program as necessary. Revenues are projected to be sufficient to cover all necessary expenses for the proposed Engineering Physics program.

ASSESSMENT AND POST-APPROVAL MONITORING

An annual performance review of the proposed program will be conducted for the first five years following program approval. The review will be based on benchmarks established in the approved proposal. At the end of this period, the campus, institutional governing board, and Commission staff will perform a summative evaluation. The benchmarks include, but are not limited to, enrollment and graduation, program cost, progress toward accreditation, and other metrics set by the institution and agreed upon by governing board and Commission staff. If benchmarks are not met during the monitoring period, the Commission may recommend that the institutional governing board terminate the program. If additional time is needed and requested by the institutional governing board, the Commission may choose to extend the monitoring period.