

PROPOSED PROGRAM SUMMARY

Institution: University of Kentucky

Program Name: Aerospace Engineering

Degree Designation: DOCTOR OF PHILOSOPHY (PHD)

Degree Level : Doctor's Degree Research/Scholarship

Program Description

The proposed aerospace engineering PhD degree program will provide a rigorous foundation in the fundamental principles of modern aerospace science and engineering. The program's main objective is to prepare its students for aerospace research and development in industry, government, and academia. The program will offer a comprehensive aerospace engineering curriculum, similar to those at the top aerospace programs in the US, with instructors who are active researchers in the aerospace community.

The program is motivated by an increasing aerospace industry within Kentucky, increasing demand from students for a structured Aerospace program at UK, and the existence of sufficient faculty expertise within the Mechanical Engineering Department at UK to offer such a program with minimal investment.

The aerospace engineering PhD program degree is a research degree granted on the basis of demonstrated broad knowledge of aerospace engineering and in-depth study in a specific area leading to a dissertation reflecting original work by the doctoral candidate. Degree requirements consist of coursework, a written preliminary examination, an oral qualifying examination, and a final dissertation defense.

The University of Kentucky's mission includes promoting economic development and improving people's lives through excellence in education and research. The proposed aerospace program supports UK's mission by increasing scientific discovery and innovation in aerospace, and by supporting the local aerospace industry with a highly-skilled workforce.

Will this program replace or enhance any existing programs(s) or tracks, concentrations, or specializations within an existing program? If yes, please specify

NA

CIP Code: 14.0201

Credit Hours: 36

Institutional Board Approval Date: 6/16/2021

Implementation Date: 8/16/2021

Student Demand

Year 1 - 5
Year 2 - 10
Year 3 - 15
Year 4 - 20
Year 5 - 25

Market Demand

Currently, undergraduate students in Mechanical Engineering that wish to pursue graduate degrees in Aerospace Engineering must look for those opportunities at other universities, and this regularly occurs with approximately 5-10 students each year pursuing AER advanced degrees elsewhere following completion of their BS in ME at UK. The current enrollment in the Mechanical Engineering PhD program is approximately 65 students with approximately 10 graduates per year. At typical joint Mechanical and Aerospace Engineering departments in other states about 1/3 of the total department students are in the Aerospace Program, thus we expect a steady enrollment of approximately 25 students, with annual PhD graduates of about 5 students. These are consistent with the demand we see just from our own BS graduates. While this is a modest number of students, we note that the existing expertise of Mechanical Engineering faculty in Aerospace fields permits this program to be launched with no required hires. The companion proposal to start a BS program in Aerospace Engineering will support hiring of several additional faculty. Thus, while the PhD program can start without the BS program, the BS program will expand aerospace expertise and permit additional courses to be added to the curriculum over time. Moreover, those faculty will support additional PhD students that will contribute to growth in this program.

Employment Demand

	Regional	State	National
Type Of Job	Aerospace Engineering (Industry: College, University)		
Avg. Wage	\$71,091	\$98,650	\$75,498
# Jobs (Postings)	11	2	165
Expected Growth	14%	14%	6%
Type Of Job	Aerospace Engineering (Industry: Scientific Research and Dev; Architectural and Engineering; Aerospa		
Avg. Wage	\$112,480	\$0	\$84,685
# Jobs (Postings)	4	0	845
Expected Growth	14%	0%	6%

Indicate source of market demand information

Salary data is from Burning Glass that uses actual job postings over the last 12 months and was supplemented by BLS/OES 2018 data when burning glass was unavailable. Projections are BLS/OES, 2018 data from 2016-2026.

Academic Demand

NA

Unnecessary Duplication

Similar Program(s):

Comparison of Objectives/Focus/Curriculum to Similar Programs:

Comparison of Student Populations:

Access to Existing Programs:

Feedback from Other Institutions:

Cost**Projected Revenue over Next Five Years (\$) : 406140****Projected Expenses over Next Five Years (\$) : 0****Will Additional faculty be needed? Yes**

No. Additional faculty will be hired as part of the companion proposal to develop a BS program in AER, and those faculty will bring new expertise that will be valuable to the PhD program. However, existing expertise is sufficient and no faculty are required just for the PhD program.

Provide a budgetary rationale for creating this new program

The Mechanical Engineering Department has developed a significant expertise in aerospace applications over the years. Present funding for research in the department is already about 1/3 in the Aerospace area with major funding coming from NASA as well as from the Department of Defense. Our elective courses in Mechanical Engineering have been developed to fit the needs of this aerospace oriented research and we find ourselves with sufficient expertise, capacity and course offerings to launch an Aerospace Engineering PhD program with no additional resources. Initial courses for the AER PhD program can take full advantage of courses already developed to meet research needs. As the program grows and new faculty are hired, particularly if the BS program is also approved, additional courses