

# Biosystems Engineering

## College of Engineering

Biosystems engineering provides an essential link between the biological sciences and the engineering profession. This linkage is necessary for the development of production and processing systems involving biological materials that preserve our natural resource base. Students have the latitude to develop an area of specialization relating to environmental engineering, biotechnology, food processing, machine systems, or controlled environment engineering. The curriculum is also ideal preparation for those students wanting to pursue a graduate or professional degree in biomedical engineering or veterinary medicine through the pre-biomedical and pre-veterinary medicine options.

The curriculum in biosystems engineering is administered jointly by the College of Engineering and the College of Agriculture. Graduates earn the Bachelor of Science in Biosystems Engineering degree.

Admission to the degree program is selective. Students should refer to the UK *Bulletin* for general information concerning admission and graduation requirements.

### Degree Requirements

In addition to fulfilling UK Core and College of Engineering requirements, students must complete the biosystems engineering curriculum. The following curriculum meets the requirements for the B.S. degree.

#### Freshman Year

First Semester	Hours
EGR 101 Engineering Exploration I $\Delta$ §	1
EGR 102 Fundamentals of Engineering Computing	2
CHE 105 General College Chemistry I or PHY 231 General University Physics ●	4
PHY 241 General University Physics Laboratory ‡	1
CIS/WRD 110 Composition and Communication I	3
MA 113 Calculus I	4
<b>Second Semester</b>	
EGR 103 Engineering Exploration II $\Delta$	2
CIS/WRD 111 Composition and Communication II	3
MA 114 Calculus II	4
PHY 231 General University Physics or CHE 105 General College Chemistry I ●	4
UK Core (Social Sciences)	3

#### Sophomore Year

First Semester	Hours
BAE 201 Economic Analysis for Biosystems	2
BIO 148 Introductory Biology I	3
MA 213 Calculus III	4
CHE 107 General College Chemistry II	3
UK Core (Humanities)	3
CE 106 Computer Graphics and Communication	3
<b>Second Semester</b>	
BAE 202 Statistical Inferences for Biosystems Engineering	3
MA 214 Calculus IV	3
ME 220 Engineering Thermodynamics I	3
EM 221 Statics	3
PHY 232 General University Physics	4
PHY 242 General University Physics Laboratory	1

#### Junior Year

First Semester	Hours
CE 341 Introduction to Fluid Mechanics	4
EE 305 Electrical Circuits and Electronics	3
EM 313 Dynamics	3
BIO 152 Principles of Biology II	3
WRD 204 Technical Writing ***	3
<b>Second Semester</b>	
ME 325 Elements of Heat Transfer	3
BAE 305 DC Circuits and Microelectronics	3
EM 302 Mechanics of Deformable Solids	3
Biological Science Elective	3
Biosystems Core Elective*	3

#### Senior Year

First Semester	Hours
BAE 402 Biosystems Engineering Design I	2
BAE 400 Senior Seminar	1
Biosystems Core* or Technical Electives**	3
Biosystems Core* or Technical Electives**	3
Biosystems Core* or Technical Electives**	3
Technical Electives**	3
UK Core (Citizenship – USA)	3
<b>Second Semester</b>	
BAE 403 Biosystems Engineering Design II	2
ME 340 Introduction to Mechanical Systems	3
Biosystems Core* or Technical Electives**	3
Biosystems Core* or Technical Electives**	3
Supporting Elective †	3
UK Core (Global Dynamics)	3

\*A minimum of 9 hours are required from the biosystems engineering core courses: BAE 417 Design of Machine Systems, BAE 427 Structures and Environment Engineering, BAE 437 Land and Water Resources Engineering, and BAE 447 Bioprocess Engineering Fundamentals.

\*\*A minimum of 12 hours are to be taken in addition to the 9 core hours selected by the student. The technical electives allow the student an opportunity to concentrate or gain depth in one or more of the various specialty areas of biosystems engineering. The technical electives must be selected from the courses listed below and approved by the student's academic advisor. Other courses may be considered, each on its individual merit.

\*\*\*Graduation Composition and Communication Requirement (GCCR) course.

**Approved technical electives:** BAE 435G, 438G, 450, 503, 504, 505, 506, 515, 517, 532, 536, 537, 538, 541, 549, 580, 599; BCH 401G; BME 301, 481G, 488, 501, 530, 599; CE 211, 351, 451, 461G, 471G, 525, 551; CHE 230, 236; CME 599; EE 402G; FSC 434G, 530, 536, 538; ME 321, 344, 440, 501, 503, 513, 532; PGY 412G; NRE 556; GEO 451G; EES 530, 585; EGR 599.

†Supporting electives are any University course excluding more elementary versions of required courses such as pre-calculus math or PHY 211.

$\Delta$  Both classes must be taken to fulfill UK Core: Arts & Creativity requirement.

● Based on advisor consult

§ Transfer students who declare a major will take EGR 112 Engineering Exploration for Transfer Students in place of EGR 101.

‡ Only if enrolled in Physics 231

University of Kentucky is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award associate, baccalaureate, masters, and doctorate degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097, call 404-679-4500, or online at [www.sacscoc.org](http://www.sacscoc.org) for questions about the accreditation of University of Kentucky.