

University of Kentucky Pigman College of Engineering

Aerospace Engineering 2025-2026 (Pathway from Union Commonwealth University)

UK Course Pathway	Hours	Transfer Courses	UK Course Pathway	Hours	Transfer Courses
Freshman Year - First Semester			Junior Year - First Semester		
EGR 101 Engineering Exploration I § v	1		EE 305 Electrical Circuits and Electronics	3	
EGR 102 Fundamentals of Engineering Computing	2	CIS 250	AER 355 Engineering Analysis	3	
CIS/WRD 110 Composition and Communication I Δ	3		AER 305 Aerospace Structures	3	
MA 113 Calculus I	4	MATH 241	AER 330 Fluid Mechanics	3	
PHY 231 General University Physics	4		WRD 204 Technical Writing	3	
PHY 241 General University Physics Laboratory	1		Junior Year - Second Semester		
Freshman Year - Second Semester			AER 310 Engineering Experimentation I	3	
EGR 103 Engineering Exploration II § v	2		AER 320 Propulsion	3	
MA 114 Calculus II	4	MATH 242	AER 325 Elements of Heat Transfer	3	
CIS/WRD 111 Composition and Communication II Δ	3		AER 345 Flight Dynamics	3	
CHE 105 General College Chemistry I	4		AER 335 Aerodynamics	3	
UK Core – Social Sciences	3				
			Senior Year – First Semester		
Sophomore Year – First Semester			AER 411 AER Capstone Design I	3	
MA 213 Calculus III	4	MATH 243	AER 410 Aerospace Engineering Laboratory	3	
PHY 232 General University Physics	4		AER 440 Design of Control Systems	3	
PHY 242 General University Physics Laboratory	1		AER 447 Orbital Dynamics	3	
EM 221 Statics	3		Technical Elective*	3	
AER 251 Introduction to Materials and Manufacturing Processes	3		Senior Year - Second Semester		
UK Core – Humanities	3		AER 412 AER Capstone Design II	3	
Sophomore Year - Second Semester			Technical Elective*	3	
AER 220 Engineering Thermodynamics I	3		Technical Elective*	3	
AER 245 Introduction to Aerospace Engineering	3		UK Core – Citizenship	3	
EM 302 Mechanics of Deformable Solids	3		UK Core – Global Dynamics	3	
EM 313 Dynamics	3				
MA 214 Calculus IV	3	MATH 341			
STA 210 Making Sense of Uncertainty: An Introduction to Statistical Reasoning OR STA 296 Statistical Methods and Motivations OR STA 381 Engineering Statistics – A Conceptual Approach	3				

*Courses required for Engineering Standing. A cumulative UK GPA of at least 2.5 and successful completion of all pre-major courses. Successful completion of the following courses with at least a 2.5 GPA: CHE 105, CIS 111/WRD 111, EGR 101, EGR 102, EGR 103 (or EGR 215 in lieu of EGR 101 and EGR 103), EM 221, MA 113, MA 114, MA 213, PHY 231, PHY 241, PHY 232, and PHY 242 and a C or better in each course. If a course is repeated, the best grade will be used for calculation of GPA in the above listed courses.

Δ Students taking ENG 101 (**ENGL 100 or 111**) and ENG 102 (**ENGL 112**) should also complete COM 181 (**COMM 211**), COM 252, COM 281 or COM 287.

§ Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.

v Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.

\$ Online courses do not transfer. Chemistry labs must be in person.

*Technical electives listed on second page.

-continued-

Aerospace Engineering 2025-2026 (2)

*Technical electives can be chosen from the following list. At least three credit hours must come from either AER/ME 501 OR AER/ME 590.

AER 380 Topics in Aerospace Engineering (Variable Topics)

AER 395 Independent Work in Aerospace Engineering

AER 501 Mechanical Design with Finite Element Methods

AER 506 Mechanics of Composite Materials

AER 510 Vibro-Acoustic Design in Mechanical Systems

AER 513 Mechanical Vibrations

AER 514 Computational Techniques in Mechanical System Analysis

AER 516 Systems Engineering

AER/ME 530 Gas Dynamics

AER 531 Fluid Dynamics I

AER 532 Advanced Strength of Materials

AER 545 Aircraft Control and Simulation

AER 548 Aerodynamics of Turbomachinery AER 563 Basic Combustion Phenomena

AER 565 Scale Modeling in Engineering

AER 590 Applied CFD and Numerical Heat Transfer

AER 599 Topics in Aerospace Engineering (Subtitle required)

University of Kentucky Pigman College of Engineering

Biomedical Engineering 2025-2026 (Pathway from Union Commonwealth University)

UK Course Pathway	Hours	Transfer Courses	UK Course Pathway	Hours	Transfer Courses
Freshman Year - First Semester			Junior Year - First Semester		
MA 113 Calculus I*	4	<i>MATH 241</i>	BME 322 Design Strategies for Biomedical Engineering	3	
PHY 231 General University Physics*	4		BME 431 Biotransport.	3	
PHY 241 General University Physics Laboratory*	1		PRD 230 Means of Production III: Computer Aided Design	3	
CIS/WRD 110 Composition and Communication I*Δ	3		PRD 260 Ergonomics	3	
EGR 101 Engineering Exploration I §v*	1		EM 313 Dynamics or MSE 201 Materials Science.	3	
EGR 102 Fundamentals of Engineering Computing *	2	<i>CIS 250</i>	UK Core – Social Sciences	3	
Freshman Year - Second Semester			Junior Year - Second Semester		
MA 114 Calculus II*	4	<i>MATH 242</i>	STA 381 Engineering Statistics – A Conceptual Approach	3	
CHE 105 General College Chemistry I*	4		BME 330 Experimental Methods in Biomedical Engineering	3	
CIS/WRD 111 Composition and Communication II*Δ.	3		BME 350 Materials and Processes	3	
EGR 103 Engineering Exploration II §*v	2		BME Elective I [1].	3	
BIO 148 Introductory Biology I*	3	<i>BIOL 111</i>	UK Core – Citizenship - USA	3	
Sophomore Year -First Semester			Senior Year - First Semester		
MA 213 Calculus III	4	<i>MATH 243</i>	BME 420 Senior Design Project in Biomedical Engineering I	3	
PHY 232 General University Physics	4		BME/PRD 451 Integrated Entrepreneurship in Product Design	2	
PHY 242 General University Physics Laboratory	1		PGY 206 Elementary Physiology	3	<i>BIOL 331</i>
BIO 152 Principles of Biology II	3		PGY 207 Case Studies in Physiology	1	
BME 201 Introduction to Biomedical Engineering	3		BME Elective II [1]	3	
EM 221 Statics	3		BME Elective III [1]	3	
Sophomore Year - Second Semester			Senior Year - Second Semester		
MA 214 Calculus IV	3	<i>MATH 341</i>	BME 421 Senior Design Project in Biomedical Engineering II ∞	3	
CHE 107 General College Chemistry II	3		BME Elective IV [1]	3	
BME/PRD 170 Human Anatomy for Design	3		Engineering Elective [2]	3	
EE 305 Electrical Circuits and Electronics	3		Engineering or Science Elective [3]	3	
UK Core – Humanities	3		UK Core – Global Dynamics	3	

*Courses are required for Engineering Standing. A cumulative UK GPA of at least 2.5 and successful completion of the following courses with at least a 2.5 GPA: BIO 148, BIO 152, BME 201, CHE 105, CIS 110 / WRD 110, CIS 111 / WRD 111, EGR 101, EGR 102, EGR 103, MA 113, MA 114, MA 213, PHY 231, PHY 241, PHY 232 and PHY 242. Completion of BME 201 with a grade of C or better. If the course is repeated, the best grade will be used for calculation of GPA in the above listed courses.

Δ Students taking ENG 101 (*ENGL 100 or 111*) and ENG 102 (*ENGL 112*) should also complete COM 181 (*COMM 211*), COM 252, COM 281, or COM 287.

§ Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.

v Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.

∞ Graduation Composition and Communication Requirement (GCCR) course.

[1] Four BME electives (BME 395, any BME course at a level of 400 or above excluding required courses).

[2] One engineering elective at a level of 300 or above that does not significantly duplicate content in required BME courses and is not a more elementary version of a required course, or a BME elective (BME 395, any BME course at a level of 400 or above excluding required courses).

-continued-

Biomedical Engineering 2025-2026 (2)

[3] One engineering or science elective. The engineering elective must meet the requirements described in #2 above. The science elective can include the following;***

[a] Chemistry: CHE 230**, CHE 232**, CHE 236**, CHE 550**

[b] Biology: BIO 208 (***BIOL 235***), BIO 302, BIO 315 (***BIOL 431***)**

[c] Biochemistry: BCH 401G (***BIOL 421***)**, BCH 419G**, BCH 501G**, BCH 520**

[d] Physiology: PGY 312, PGY 412G, PGY 417, PGY 431**

[e] ABT: ABT 360

[f] Other courses approved by the Director of Undergraduate Studies.

**Courses designated with two asterisks have prerequisites that are not included in the BME curriculum. Please consult the department or the instructor for special permission.

***All electives should be chosen in consultation with the student's advisor.

\$ Online courses do not transfer. Chemistry labs must be in person.

University of Kentucky Pigman College of Engineering

Biosystems Engineering 2025-2026 (Pathway from Union Commonwealth University)

UK Course Pathway	Hours	Transfer Courses	UK Course Pathway	Hours	Transfer Courses
Freshman Year - First Semester			Junior Year - First Semester		
EGR 101 Engineering Exploration I § †	1		BAE 202 Statistical Inferences for Biosystems Engineering	3	
EGR 102 Fundamentals of Engineering Computing	2	<i>CIS 250</i>	ME 220 Engineering Thermodynamics I	3	
CHE 105 General College Chemistry I*	4		WRD 204 Technical Writing ∞	3	
CIS/WRD 110 Composition and Communication I*Δ	3		EE 305 Electrical Circuits and Electronics	3	
MA 113 Calculus I *	4	<i>MATH 241</i>	EM 302 Mechanics of Deformable Solids	3	
Freshman Year - Second Semester			UK Core - Social Science	3	
EGR 103 Engineering Exploration II § †	2		Junior Year - Second Semester		
MA 114 Calculus II *	4	<i>MATH 242</i>	BAE 305 DC Circuits and Microelectronics	3	
CIS/WRD 111 Composition and Communication II Δ	3		BAE 310 Heat and Mass Transfer in Biosystems Engineering	3	
PHY 231 General University Physics*	4		ME 330 Fluid Mechanics	3	
PHY 241 General University Physics Laboratory	1		EM 313 Dynamics	3	
UK Core - Humanities	3		Biosystems Core Elective**	3	
Sophomore Year - First Semester			Senior Year - First Semester		
BAE 200 Principles of Biosystems Engineering*	3		BAE 400 Senior Seminar	1	
MA 213 Calculus III*	4	<i>MATH 243</i>	BAE 402 Biosystems Engineering Design I	3	
BIO 148 Introductory Biology I	3	<i>BIOL 111</i>	Biosystems Core** or Technical Elective***	3	
CHE 107 General College Chemistry II	3		Biosystems Core** or Technical Elective***	3	
EM 221 Statics	3		Biosystems Core** or Technical Elective***	3	
Sophomore Year - Second Semester			Biological Science Elective	3	
BAE 205 Computer Aided Design for Biosystems Engineering	3		Senior Year - Second Semester		
BAE 206 Introduction to Biosystems Design & Economics	3		BAE 403 Biosystems Engineering Design II	2	
MA 214 Calculus IV	3	<i>MATH 341</i>	BAE 502 Modeling of Biological Systems	3	
PHY 232 General University Physics	4		Biosystems Core** or Technical Elective***	3	
PHY 242 General University Physics Laboratory	1		Biosystems Core** or Technical Elective***	3	
BIO 152 Principles of Biology	3		UK Core - Global Dynamics	3	
			UK Core - Citizenship - USA.	3	

*Courses are required for Engineering Standing. A cumulative UK GPA of at least 2.5 and successful completion of all pre-major courses. Successful completion of the following courses with at least a 2.5 GPA: CHE 105, CIS 110/WRD 110, MA 113, MA 114, MA 213, and PHY 231. Completion of BAE 200 with a grade of C or better. If a course is repeated, the best grade will be used for calculation of GPA in the above listed courses.

Δ Students taking ENG 101 (*ENGL 100 or 111*) and ENG 102 (*ENGL 112*) should also complete COM 181 (*COMM 211*), COM 252, COM 281, or COM 287.

§ Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.

† Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.

**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.

-continued-

Biosystems Engineering 2025-2026 (2)

***A minimum of 9 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.

Approved technical electives: ABT 360, 495; AEN 341; ASC 325, 364; BAE 395, 435G, 450, 506, 514, 515, 516, 532, 535, 536, 538, 541, 542, 543, 545, 547, 549, 570, 580, 583, 599; BCH 401G (**BIOL 421**); BIO 302, 303, 304 (**BIOL 362**), 305, 315 (**BIOL 431**), 350, 395; BME 301, 395, 472, 473, 488, 540, 550, 571, 579, 599; CE 211, 303, 351, 395, 461G, 471G, 525, 551; CHE 230, 236, 440G, 446G, 565; CME 599; EE 402G; EES 530, 585; EGR 380, 540, 542, 546, 599; FSC 434G, 530, 536, 538; GEO 309, 451G; ME 321, 344, 395, 440, 501, 503, 513, 532; NRE 556; PGY 412G.

∞ Graduation Composition and Communication Requirement (GCCR) course.

\$ Online courses do not transfer. Chemistry labs must be in person.

University of Kentucky Pigman College of Engineering

Chemical Engineering 2025-2026 (Pathway from Union Commonwealth University)

UK Course Pathway	Hours	Transfer Courses	UK Course Pathway	Hours	Transfer Courses
Freshman Year - First Semester			Junior Year - First Semester		
CIS/WRD 110 Composition and Communication I*Δ	3		CME 330 Fluid Mechanics	3	
MA 113 Calculus I*	4	MATH 241	CME 415 Separation Processes	3	
EGR 101 Engineering Exploration I § †	1		CME 470 Safety, Ethics and Sustainability	3	
EGR 102 Fundamentals of Engineering Computing	2	CIS 250	CHE 230 Organic Chemistry I	3	
CHE 105 General College Chemistry I*	4		CHE 231 Organic Chemistry Laboratory I \$	1	
CHE 111 General Chemistry I Laboratory*\$	1		WRD 204 Technical Writing ∞	3	
Junior Year - Second Semester			Junior Year - Second Semester		
CIS/WRD 111 Composition and Communication II Δ	3		CME 006 The Engineering Profession (Junior and Senior)	0	
MA 114 Calculus II*	4	MATH 242	CME 420 Process Modeling in Chemical Engineering	3	
EGR 103 Engineering Exploration II § †	2		CME 425 Heat and Mass Transfer	4	
PHY 231 General University Physics*	4		CME 432 Chemical Engineering Laboratory I	2	
UK Core – Humanities	3		CHE 232 Organic Chemistry II	3	
			Engineering/Science Elective [1] - Science	3	
Sophomore Year - First Semester					
CME 200 Process Principles	3		Senior Year - First Semester		
MA 213 Calculus III*	4	MATH 243	CME 006 The Engineering Profession (Junior and Senior)	0	
CHE 107 General College Chemistry II*	3		CME 433 Chemical Engineering Laboratory II	3	
CHE 113 General Chemistry II Laboratory* \$	2		CME 455 Chemical Engineering Process Design I	3	
MSE 201 Materials Science	3		CME 550 Chemical Reactor Design	4	
UK Core – Social Sciences	3		Engineering/Science Elective [1] - Chemical Engineering	3	
Sophomore Year - Second Semester			UK Core – Citizenship - USA	3	
CME 220 Computational Tools in Chemical Engineering	3		Senior Year - Second Semester		
CME 320 Engineering Thermodynamics	3		CME 006 The Engineering Profession (Junior and Senior)	0	
MA 214 Calculus IV	3	MATH 341	CME 456 Chemical Engineering Process Design II	3	
PHY 232 General University Physics	4		CME 462 Process Control	3	
STA 381 Engineering Statistics – A Conceptual Approach	3		Engineering/Science Elective [1]	3	
			Engineering/Science Elective [1]	3	
			UK Core – Global Dynamics	3	

*Courses are required for Engineering Standing. A cumulative UK GPA of at least 2.5 and successful completion of all pre-major courses. Successful completion of the following courses with at least a 2.5 GPA: CHE 105, CHE 107, CHE 111, CHE 113, CIS 110/WRD 110, MA 113, MA 114, MA 213, and PHY 231. Completion of CME 200 with a grade of C or better. If a course is repeated, the best grade will be used for calculation of GPA in the above listed courses.

Δ Students taking ENG 101 (**ENGL 100 or 111**) and ENG 102 (**ENGL 112**) should also complete COM 181 (**COMM 211**), COM 252, COM 281, or COM 287.

§ Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.

† Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.

∞ Graduation Composition and Communication Requirement (GCCR) course.

-continued-

Chemical Engineering 2025-2026 (2)

[1] Engineering/Science Elective Structure. Students must select four courses as follows:

1. Chemical Engineering elective [CME 395***, 404G, 505, 523, 542, 552, 556, 570, 573, 580, 599]
2. Science/math elective (totaling three or more credit hours) that is not a more elementary version of a required course. [Students may combine multiple qualifying courses that total 3 credits (e.g. pre-medical students may wish to combine PHY 241, 242, and CHE 233)]
 - a. Math (MA 321, 322 (*MATH 331 or 332*), 416G, 432G, 433G (*MATH 402*), 471G (*MATH 403*), 481G)
 - b. Chemistry (CHE 226 [*CHEM 212*], 250, 510 and above)
 - c. Biology [BIO 148 (*BIOL 111*) and above]
 - d. Physics [PHY 241 and above]
 - e. Other courses by approval of Director of Undergraduate Studies
3. Engineering elective (level 300 and above) that does not significantly duplicate content in a core chemical engineering course (e.g. ME 330) OR a CME Elective (CME 395 & above).
4. Chemical engineering elective (CME 395 and above) OR one engineering elective (level 300 and above) OR one science/math elective as described above.

***CME 395 (3 credits) may be used to satisfy only one elective requirement

\$ Online courses do not transfer. Chemistry labs must be in person.

University of Kentucky Pigman College of Engineering

Civil Engineering 2025-2026 (Pathway from Union Commonwealth University)

UK Course Pathway	Hours	Transfer Courses	UK Course Pathway	Hours	Transfer Courses
Freshman Year - First Semester			Junior Year - First Semester		
EGR 101 Engineering Exploration I § †	1		WRD 204 Technical Writing ∞	3	
EGR 102 Fundamentals of Engineering Computing	2	CIS 250	EES 220 Principles of Physical Geology	4	
CIS/WRD 110 Composition and Communication I*Δ	3		CE 341 Introduction to Fluid Mechanics	4	
MA 113 Calculus I *	4	MATH 241	CE 381 Civil Engineering Materials I	3	
CHE 105 General College Chemistry I *	4		Statistics Elective [1].	3	
Freshman Year - Second Semester			Junior Year - Second Semester		
EGR 103 Engineering Exploration II § †	2		CE 303 Introduction to Construction Engineering	3	
CIS/WRD 111 Composition and Communication II Δ	3		CE 331 Transportation Engineering	3	
MA 114 Calculus II*	4	MATH 242	CE 351 Introduction to Environmental Engineering	3	
PHY 231 General University Physics*	4		CE 482 Structural Analysis and Design	3	
PHY 241 General University Physics Laboratory*	1		Engineering Science Elective [2]	3	
UK Core – Social Sciences	3				
			Senior Year - First Semester	Hours	
Sophomore Year - First Semester	Hours		CE 461G Water Resources Engineering	4	
CE 106 Computer Graphics and Communication*	3		CE 471G Soil Mechanics	4	
CE 211 Surveying*	4		CE Design Elective [3]	3	
CHE 107 General College Chemistry II*	3		Math/Science/Technical Elective [5]	3	
EM 221 Statics*	3		UK Core – Citizenship - US	3	
MA 213 Calculus III*	4	MATH 243	Senior Year - Second Semester		
Sophomore Year - Second Semester			CE 401 Seminar	1	
CE 218 Sustainable Engineering	3		CE 429 Civil Engineering Systems Design	3	
EM 302 Mechanics of Deformable Solids	3		CE Design Elective [3]	3	
MNG 303 Deformable Solids Laboratory	1		Technical Elective [4]	3	
MA 214 Calculus IV	3	MATH 341	UK Core – Humanities	3	
PHY 232 General University Physics	4		UK Core – Global Dynamics	3	
PHY 242 General University Physics Laboratory	1				

*Courses are required for Engineering Standing. A cumulative UK GPA of at least 2.5 and successful completion of all pre-major courses. Successful completion of the following courses with at least a 2.5 GPA: CE 106, CE 211, CHE 105, CHE 107, CIS 110/WRD 110, EGR 103, EM 221, MA 113, MA 114, MA 213, PHY 231, and PHY 241 and a C or better in each course. If a course is repeated, the best grade will be used for calculation of GPA in the above listed courses.

Δ Students taking ENG 101 (**ENGL 100 or 111**) and ENG 102 (**ENGL 112**) should also complete COM 181 (**COMM 211**), COM 252, COM 281, or COM 287.

§ Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.

† Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.

∞ Graduation Composition and Communication Requirement (GCCR) course.

-continued-

Civil Engineering 2025-2026 (2)

[1] STA 296 or STA 381.

[2] ME 220 or EM 313.

[3] Students are required to select two design electives from different areas. Choose from: CE 508, CE 519, CE 531 or CE 533, CE 534, CE 549, CE 551 or CE 599, CE 579, CE 589. Design elective courses are typically taught once a year.

[4] Technical Electives are to be chosen from any of the courses at the 300-level or above that carry a CE prefix and in which a student is qualified to enroll, exclusive of required courses. Engineering elective courses are typically taught once a year.

[5] Math/Science/Technical Elective Options: MA 321, MA 322 (**MATH 331 or 332**), CHE 230, CHE 236, EE 305, EES 550, EES 560, EES 585, MNG 551 or the other half of the Engineering Science Elective in (2), or Technical Elective as defined in (4).

\$ Online courses do not transfer. Chemistry labs must be in person.

University of Kentucky Pigman College of Engineering

Computer Engineering 2025-2026 (Pathway from Union Commonwealth University)

UK Course Pathway	Hours	Transfer Courses	UK Course Pathway	Hours	Transfer Courses
Freshman Year - First Semester			Junior Year - First Semester		
EGR 101 Engineering Exploration I § †	1		EE 223 AC Circuits	4	
EGR 102 Fundamentals of Engineering Computing	2	CIS 250	CS 315 Algorithm Design and Analysis	3	
MA 113 Calculus I	4	MATH 241	CPE 380 Computer Organization	3	
CHE 105 General College Chemistry I*	4		STA 381 Engineering Statistics – A Conceptual Approach	3	
CIS/WRD 110 Composition and Communication I*Δ	3		UK Core – Humanities	3	
Freshman Year - Second Semester			Junior Year - Second Semester		
EGR 103 Engineering Exploration II § †	2		EE 421G Signals and Systems	3	
MA 114 Calculus II	4	MATH 242	EE 461G Introduction to Electronics	3	
PHY 231 General University Physics*	4		Technical Elective††	3	
PHY 241 General University Physics Laboratory	1		CPE 480 Advanced Computer Architecture	3	
CIS/WRD 111 Composition and Communication II Δ	3		UK Core – Social Sciences	3	
CS 215 Introduction to Program Design, Abstraction, and Problem Solving Techniques*	4				
			Senior Year - First Semester	Hours	
Sophomore Year - First Semester	Hours		CPE 490 ECE Capstone Design I ∞	3	
MA 213 Calculus III	4	MATH 243	CPE Elective†††	3	
PHY 232 General University Physics	4		CPE Elective†††	3	
PHY 242 General University Physics Laboratory	1		Technical Elective†	3	
CS 216 Introduction to Software Engineering Techniques*	3		UK Core – Citizenship - USA	3	
CPE 200 Computer Engineering Sophomore Seminar	1		Second Semester		
CPE 282 Digital Logic Design*	4		CPE 491 ECE Capstone Design II †	3	
Second Semester			Hardware Elective €	3	
MA 214 Calculus IV	3	MATH 341	Software Elective ~	3	
EE 211 Circuits I	4		CPE Elective†††	3	
CPE 287 Introduction to Embedded Systems	4		UK Core – Global Dynamics	3	
CS 270 Systems Programming	3				
CS 275 Discrete Mathematics	4				

*Courses are required for Engineering Standing. A cumulative UK GPA of at least 2.5 and successful completion of all pre-major courses. Successful completion of the following courses with at least a 2.5 GPA: CHE 105, CIS 110/WRD 110, CS 215, CS 216, EE 282/CPE 282, and PHY 231. If a course is repeated, the best grade will be used for calculation of GPA in the above listed courses.

Δ Students taking ENG 101 (**ENGL 100 or 111**) and ENG 102 (**ENGL 112**) should also complete COM 181 (**COMM 211**), COM 252, COM 281, or COM 287.

§ Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.

† Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.

∞ Graduation Composition and Communication Requirement (GCCR) course.

†† Technical elective may be selected from upper-division engineering, mathematics, statistics, computer science, physics, or other technically-related fields excluding more elementary version of required courses. To be selected in consultation with academic advisor. If a student wishes to use CS 499 instead of CPE 490 and CPE 491 to fulfill the GCCR and senior design requirements, the student must receive approval from the DUS to select an additional technical elective that supports the proposed CS 499 project.

-continued-

Computer Engineering 2025-2026 (2)

††† 400-level CS courses and 500-level CPE and EE courses with emphasis in the computer engineering area. To be selected in consultation with academic advisor.

€ Hardware electives are senior level courses in the CPE or EE disciplines and shall be selected from the following list and/or selected in consultation with academic advisor:

EE 582 Hardware Description Languages and Programmable Logic

CPE 584 Introduction of VLSI Design and Testing

CPE 585 Fault Tolerant Computing

CPE 586 Communication and Switching Networks

~ Software electives are senior level courses in the CPE or CS disciplines and shall be selected from the following list and/or selected in consultation with academic advisor:

CS 441G Compilers for Algorithmic Languages (fall only)

CS 471G Networking and Distributed Operating Systems

CS 570 Modern Operating Systems

CPE 588 Real-Time Computer Systems

\$ Online courses do not transfer. Chemistry labs must be in person.

University of Kentucky Pigman College of Engineering

Computer Science 2025-2026 (Pathway from Union Commonwealth University)

UK Course Pathway	Hours	Transfer Courses	UK Course Pathway	Hours	Transfer Courses
Freshman Year - First Semester			Junior Year - First Semester		
EGR 101 Engineering Exploration I § †	1		CS/MA 321 Introduction to Numerical Methods or MA 322 Matrix Algebra and Its Applications	3	MATH 331 or 332
EGR 102 Fundamentals of Engineering Computing	2	CIS 250	CS 371 Introduction to Computer Networking	3	
CHE 105 General College Chemistry I	4		STA 381 Engineering Statistics – A Conceptual Approach	3	
CIS/WRD 110 Composition and Communication I Δ	3		Computer Science Elective [C]	3	
MA 113 Calculus I	4	MATH 241	Computer Science Elective [C]	3	
Freshman Year - Second Semester			Junior Year - Second Semester		
CIS/WRD 111 Composition and Communication II Δ	3		CS 375 Logic and Theory of Computing	3	
MA 114 Calculus II *	4	MATH 242	Computer Science Elective [C]	3	
PHY 231 General University Physics	4		Computer Science Elective [C]	3	
PHY 241 General University Physics Laboratory ‡	1		Natural Science Elective [N]	3	
CS 215 Introduction to Program Design, Abstraction, and Problem Solving Techniques*	4		Technical Elective [T]	3	
EGR 103 Engineering Exploration II †	2		UK Core – Citizenship - US	3	
Sophomore Year - First Semester	Hours		Senior Year - First Semester	Hours	
CS 217 Introduction to Data Structures*	3		CS 450G.Fundamentals of Programming Languages	3	
CS 218 Advanced Programming and Operating Systems Interfaces*	3		CS 498 Software Engineering for Senior Project	3	
CS 275 Discrete Mathematics*	4		Technical Elective [T]	3	
MA 213 Calculus III	4	MATH 243	Free Elective [E]	4	
UK Core – Social Sciences	3		UK Core – Global Dynamics	3	
Sophomore Year - Second Semester			Senior Year - Second Semester		
CS 270 Systems Programming	3		CS 499 Senior Design Project ∞	3	
CS 315 Algorithm Design and Analysis	3		Computer Science Elective [C]	3	
EE 280 Design of Logic Design	4		Technical Elective [T]	3	
Science Elective [S]	3		Technical Elective [T]	3	
UK Core – Humanities	3		Free Elective [E]	3	

*Courses required for Engineering Standing. A cumulative UK GPA of at least 2.5 and successful completion of all pre-major courses. Successful completion of the following courses with at least a 2.5 GPA: CS 215, CS 217, CS 218, CS 275, and MA 114. If a course is repeated, the best grade will be used for calculation of GPA in the above listed courses.

Δ Students taking ENG 101 (**ENGL 100 or 111**) and ENG 102 (**ENGL 112**) should also complete COM 181 (**COMM 211**), COM 252, COM 281, or COM 287.

§ Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.

† Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.

‡ Only if enrolled in PHY 231.

[T] Technical Elective (12 credit hours) - any additional 300-level or higher classes selected from computer science, electrical engineering, mathematics [including MA 214 and excluding MA 308 and MA 310], the Gatton College of Business and Economics, or by the Department of Computer Science's approval

[S] Science Elective (3 credit hours)- must be selected from UK core natural science list, UK core social science list, or approved by the Department of Computer Science. Natural science course cannot be an elementary version of a required course.

-continued-

Computer Science 2025-2026 (2)

[C] Computer Science Elective (15 credit hours) – include 300-level and above computer science courses with three classes to be selected from: CS 316, CS 335, CS 378, CS 405G, CS 441G, CS 460, CS 463G, or by the Department of Computer Science's approval.

[N] Natural Science (3 credit hours) – Any natural science course to be selected from the UK core natural science list or approved by the Department of Computer Science. Natural science course cannot be an elementary version of a required course.

[E] Free Elective (7 credit hours) – can be any course that earns college credit and is not a more elementary version of a required course. 3 credits are not to be selected from computer science, mathematics, natural science and engineering.

∞ Graduation Composition and Communication Requirement (GCCR) course.

\$ Online courses do not transfer. Chemistry labs must be in person.

University of Kentucky Pigman College of Engineering

Electrical Engineering 2025-2026 (Pathway from Union Commonwealth University)

UK Course Pathway	Hours	Transfer Courses	UK Course Pathway	Hours	Transfer Courses
Freshman Year - First Semester			Junior Year - First Semester		
EGR 101 Engineering Exploration I § †	1		EE 415G Electromechanics	3	
EGR 102 Fundamentals of Engineering Computing	2	CIS 250	EE 421G Signals and Systems	3	
PHY 231 General University Physics	4		Elective EE Laboratory [L]	2	
PHY 241 General University Physics Laboratory	1		EE 461G Introduction to Electronics	3	
CIS/WRD 110 Composition and Communication I Δ	3		MA 320 Introductory Probability or STA 381 Engineering Statistics – A Conceptual Approach	3	MATH 372
MA 113 Calculus I	4	MATH 241	Technical Elective [T]	3	
Freshman Year - Second Semester			Second Semester		
EGR 103 Engineering Exploration II § †	2		EE 468G Introduction to Engineering Electromagnetics	4	
CIS/WRD 111 Composition and Communication II Δ	3		Elective EE Laboratory [L]	2	
MA 114 Calculus II	4	MATH 242	Engineering/Science Elective [E]	3	
CHE 105 General College Chemistry I	4		Technical Elective [T]	3	
CS 215 Introduction to Program Design, Abstraction, and Problem Solving	4		UK Core – Citizenship - USA	3	
Sophomore Year - First Semester	Hours		Senior Year - First Semester	Hours	
MA 213 Calculus III	4	MATH 243	EE/CPE 490 ECE Capstone Design I ∞	3	
PHY 232 General University Physics	4		EE Technical Elective**	3	
PHY 242 General University Physics Laboratory	1		EE Technical Elective**	3	
EE 211 Circuits I	4		Math/Statistics Elective [M]	3	
EE/CPE 282 Digital Logic Design	4		UK Core – Global Dynamics	3	
Sophomore Year - Second Semester			Sophomore Year - Second Semester		
MA 214 Calculus IV	3	MATH 341	EE/CPE 491 ECE Capstone Design II	3	
EE 223 AC Circuits	4		EE Technical Elective**	3	
EE/CPE 287 Introduction to Embedded Systems	4		EE Technical Elective**	3	
UK Core – Social Sciences	3		Engineering/Science Elective [E]	3	
UK Core – Humanities	3		UK Core – Statistical Inferential Reasoning	3	

*Courses are required for Engineering Standing. A cumulative UK GPA of at least 2.5 and successful completion of all pre-major courses. Successful completion of the following courses with at least a 2.5 GPA: CIS 110/WRD 110, CHE 105, CS 215, EE 211, EE 282/CPE 282, and PHY 231. If a course is repeated, the best grade will be used for calculation of GPA in the above listed courses.

Δ Students taking ENG 101 (**ENGL 100 or 111**) and ENG 102 (**ENGL 112**) should also complete COM 181 (**COMM 211**), COM 252, COM 281, or COM 287.

§ Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.

† Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.

[M] Math/Statistics Elective: Any upper-division (300-level or higher) math or statistics course excluding MA 308 and MA 310 (3 credit hours total).

[E] Engineering/Science Electives: Any engineering, physics, computer science, or math course at the 200-level or higher, other than an electrical engineering course and excluding MA 308, MA 310, and more elementary versions of required courses (6 credit hours total). Cooperative education credit may not be used to satisfy this requirement.

[T] Technical elective may be selected from upper-division (300-level or higher) engineering, mathematics, statistics, computer science, physics, or other technically- related fields excluding MA 308, MA 310, EE 305, and more elementary versions of required courses, to be selected in consultation with the academic advisor (6 credit hours total).

[L] Electrical Engineering Laboratory Elective: EE 416G, EE 422G, EE 462G (4 credit hours total).

∞ Graduation Composition and Communication Requirement (GCCR) course.

\$ Online courses do not transfer. Chemistry labs must be in person.

-continued-

Electrical Engineering 2025-2026 (2)

****EE Technical Electives (must be 500-level courses).** Courses recommended as electrical engineering technical electives are listed below (each course is 3 credit hours):

EE 503 Power Electronics
EE 511 Introduction to Communication Systems
EE 512 Digital Communication Systems
EE 513 Audio Signals and Systems
EE 517 Advanced Electromechanics
EE 518 Electric Drives
EE 522 Antenna Design
EE 523 Microwave Circuit Design
EE 525 Numerical Methods and Electromagnetics
EE 526 Lean Operations Management I
EE 527 Electromagnetic Compatibility
EE 528 Automotive Body Welding
EE 531 Alternative and Renewable Energy Systems
EE 532 Smart Grid: Automation and Control of Power Systems
EE 533 Advanced Power System Protection
EE 535 Power Systems: Generation, Operation and Control
EE 536 Power System Fault Analysis and Protection
EE 537 Electric Power Systems I
EE 538 Electric Power Systems II
EE 539 Power Distribution Systems
EE 543 Solar Cell Devices and Systems for Electrical Energy Generation
EE 546 Electric Power System Fundamentals
EE 549 Power and Energy Experiences
EE 555 Introduction to Micro-/Nano-Electromechanical Systems
EE 560 Semiconductor Device Design
EE 566 Engineering Optics
EE 567 Introduction to Lasers and Masers
EE 569 Electronic Packaging Systems and Manufacturing Processes
EE 571 Feedback Control Design
EE 572 Digital Control of Dynamic Systems
EE 576 Cybersecurity
EE 578 Process Monitoring and Machine Learning
EE 579 Neural Engineering: Merging Engineering with Neuroscience
EE 580 Embedded System Design
EE 582 Hardware Description Languages and Programmable Logic
EE 583 Industrial Energy Utilization and Assessment
EE 584 Introduction of VLSI Testing and Design
EE 585 Fault Tolerant Computing
EE 586 Communication and Switching Networks
EE 587 Microcomputer Systems Design
EE 588 Real-Time Computer Systems
EE 589 Advanced VLSI
EE 599 Topics in Electrical Engineering (Subtitle required)

University of Kentucky Pigman College of Engineering

Materials Engineering 2025-2026 (Pathway from Union Commonwealth University)

UK Course Pathway	Hours	Transfer Courses	UK Course Pathway	Hours	Transfer Courses
Freshman Year - First Semester			Junior Year - First Semester		
EGR 101 Engineering Exploration I § †	1		MSE 401G Metal and Alloys	3	
EGR 102 Fundamentals of Engineering Computing	2	<i>CIS 250</i>	MSE 404G Polymeric Materials	3	
CHE 105 General College Chemistry I*	4		CME 200 Process Principles	3	
CHE 111 General Chemistry I Laboratory* §	1		EM 302 Mechanics of Deformable Solids	3	
CIS/WRD 110 Composition and Communication I*Δ	3		STA 381 Engineering Statistics – A Conceptual Approach	3	
MA 113 Calculus I*	4	<i>MATH 241</i>	UK Core – Humanities	3	
Freshman Year - Second Semester			Junior Year - Second Semester		
EGR 103 Engineering Exploration II § †	2		MSE 402G Electronic Materials and Processing	3	
CIS/WRD 111 Composition and Communication II Δ	3		MSE 403G Ceramic Engineering and Processing	3	
MA 114 Calculus II *	4	<i>MATH 242</i>	MSE 407 Materials Laboratory I ∞	3	
PHY 231 General University Physics*	4		MSE 535 Mechanical Properties of Materials	3	
PHY 241 General University Physics Laboratory*	1		PHY 361 Principles of Modern Physics	3	
UK Core – Social Sciences	3				
			Senior Year - First Semester	Hours	
Sophomore Year - First Semester	Hours		MSE 408 Materials Laboratory II	3	
MSE 201 Materials Science	3		MSE 436 Material Failure Analysis	3	
MSE 202 Materials Science Laboratory	1		MSE 470 Application of Materials Engineering to Design Problems	1	
MA 213 Calculus III*	4	<i>MATH 243</i>	MSE 585 Materials Characterization Techniques	3	
CHE 107 General College Chemistry II*	3		EE 305 Electrical Circuits and Electronics	3	
CHE 113 General Chemistry II Laboratory* §	2		Technical Elective (MSE prefix) [1].	3	
EM 221 Statics	3		Senior Year - Second Semester		
Senior Year - Second Semester			MSE 480 Materials Design	3	
MSE 301 Materials Science II	3		MSE 538 Metals Processing	3	
MSE 351 Materials Thermodynamics	3		Technical Elective [1]	3	
MA 214 Calculus IV	3	<i>MATH 341</i>	UK Core – Citizenship - USA	3	
PHY 232 General University Physics	4		UK Core – Global Dynamics	3	
CHE 236 Survey of Organic Chemistry	3				

*Courses are required for Engineering Standing. A cumulative UK GPA of at least 2.5 and successful completion of all pre-major courses. Successful completion of the following courses with at least a 2.5 GPA: CHE 105, CHE 107, CHE 111, CHE 113, CIS 110/WRD 110, MA 113, MA 114, MA 213, PHY 231, and PHY 241. Completion of MSE 201 with a grade of C or better. If a course is repeated, the best grade will be used for calculation of GPA in the above listed courses.

Δ Students taking ENG 101 (*ENGL 100 or 111*) and ENG 102 (*ENGL 112*) should also complete COM 181 (*COMM 211*), COM 252, COM 281, or COM 287.

§ Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.

† Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.

[1] Technical Electives - total of 6 credit hours must be chosen. Technical electives are to be selected from a technical discipline, with approval from the Director of Undergraduate Studies. At least 3 credit hours must come from a course with a MSE prefix. MSE 395 (research) may count for one elective, but not both. Recommended technical electives include but are not limited to: MSE 395, 506, 552, 556, 569, 599; BME 488; CHE 580; CME 542, 599; MA 322, 422, 432G; ME/MFS 503.

∞ Graduation Composition and Communication Requirement (GCCR) course.

§ Online courses do not transfer. Chemistry labs must be in person.

University of Kentucky Pigman College of Engineering

Mechanical Engineering 2025-2026 (Pathway from Union Commonwealth University)

UK Course Pathway	Hours	Transfer Courses	UK Course Pathway	Hours	Transfer Courses
Freshman Year - First Semester			Junior Year - First Semester		
EGR 101 Engineering Exploration I § † *	1		EM 302 Mechanics of Deformable Solids	3	
EGR 102 Fundamentals of Engineering Computing*	2	CIS 250	EE 305 Electrical Circuits and Electronics	3	
CIS/WRD 110 Composition and Communication I*	3		ME 321 Engineering Thermodynamics II	3	
MA 113 Calculus I*	4	MATH 241	ME 330 Fluid Mechanics	3	
PHY 231 General University Physics*	4		WRD 204 Technical Writing**	3	
PHY 241 General University Physics Laboratory *	1		Junior Year - Second Semester		
Freshman Year - Second Semester			ME 310 Engineering Experimentation I	3	
EGR 103 Engineering Exploration II § † *	2		ME 325 Elements of Heat Transfer	3	
MA 114 Calculus II *	4	MATH 242	ME 340 Introduction to Mechanical Systems	3	
CIS/WRD 111 Composition and Communication II Δ	3		ME 344 Mechanical Design	3	
CHE 105 General College Chemistry I*	4		Mathematics Elective***	3	
UK Core ¶ – Social Sciences	3				
			Senior Year - First Semester		
Sophomore Year- First Semester			ME 411 ME Capstone Design I	3	
MA 213 Calculus III*	4	MATH 243	ME 311 Engineering Experimentation II	3	
PHY 232 General University Physics*	4		ME 440 Design of Control Systems	3	
PHY 242 General University Physics Laboratory*	1		ME 501 Mechanical Design with Finite Element Methods		
EM 221 Statics*	3		or		
ME 205 Computer Aided Engineering Graphics	3		ME 590 Computational Fluid Dynamics	3	
Guided Elective^ or UK Core ¶ – Humanities	3		Technical Elective††	3	
Sophomore Year - Second Semester			Senior Year - Second Semester		
ME 220 Engineering Thermodynamics I	3		ME 412 ME Capstone Design II	3	
ME 251 Introduction to Materials and Manufacturing Processes	3		Technical Elective††	3	
MA 214 Calculus IV	3	MATH 341	Technical Elective††	3	
EM 313 Dynamics	3		UK Core* – Citizenship - US	3	
Guided Elective^ or UK Core* – Humanities	3		UK Core* – Global Dynamics	3	
Guided Elective^ or UK Core* – Statistical Inferential Reasoning. Recommended: STA 210 Making Sense of Uncertainty: An Introduction to Statistical Reasoning or STA 381 Engineering Statistics – A Conceptual Approach	3				

*Courses required for Engineering Standing. A cumulative UK GPA of at least 2.5 and successful completion of all pre-major courses. Successful completion of the following courses with at least a 2.5 GPA: CHE 105, CIS 111/WRD 111, EGR 101, EGR 102, EGR 103 (or for transfer students EGR 215 in lieu of EGR 101 and EGR 103), EM 221, MA 113, MA 114, MA 213, PHY 231, PHY 241, PHY 232, and PHY 242 and a C or better in each course. If a course is repeated, the best grade will be used for calculation of GPA in the above listed courses.

Δ Students taking ENG 101 (**ENGL 100 or 111**) and ENG 102 (**ENGL 112**) should also complete COM 181 (**COMM 211**), COM 252, COM 281, or COM 287.

§ Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.

† Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.

¶ To be selected from UK Core courses in consultation with the academic advisor.

^Guided Elective – choose one course from the approved list.

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

***Mathematics Elective – choose one course from approved list.

††Technical Elective – choose 9 hours from approved list.

\$ Online courses do not transfer. Chemistry labs must be in person.

-continued-

Mechanical Engineering 2025-2026 (2)

Guided Elective

Choose one of the following:

CHE 107 General College Chemistry II

CS 115 Introduction to Computer Programing

CS 215 Introduction to Program Design, Abstraction and Problem Solving

*ME 380 Topics in Mechanical Engineering (Subtitle required)

*ME 501 Mechanical Design with Finite Element Methods

or

*ME 590 Computational Fluid Dynamics

*If not used in the Major Requirements above.

Mathematics Elective

Choose one course from the following:

MA 320 (*MATH 372*) Introductory Probability

MA 321 Introduction to Numerical Methods

MA 322 (*MATH 331 or 332*) Matrix Algebra and Its Applications

MA 416G Introduction to Optimization

MA 432G Methods of Applied Mathematics I

MA 433G (*MATH 402*) Introduction to Complex Variables

MA 481G Differential Equations

STA 381 Engineering Statistics – A Conceptual Approach

Subtotal: Mathematics Elective 3 hours

Technical Electives

Choose 9 hours from the following:*

ME 380 Topics in Mechanical Engineering (Variable Topics)

ME 395 Independent Work in Mechanical Engineering

ME 416 Automotive Painting Technology

ME 417 Sheet Metal Forming

ME 418 Automotive Assembly and Quality Control

ME 501 Mechanical Design with Finite Element Methods

ME/MFS 503 Lean Manufacturing Principles and Practices

ME/MFS 505 Modeling of Manufacturing Processes and Machines

ME/MSE 506 Mechanics of Composite Materials

ME/MFS 507 Design for Manufacturing

ME 510 Vibro-Acoustic Design in Mechanical Systems

ME/MFS 511 Machining of Materials and Applications

ME/MFS 512 Manufacturing Systems

ME 513 Mechanical Vibrations

ME 514 Computational Techniques in Mechanical System Analysis

ME 515 Rotordynamics of Turbomachinery

ME 516 Systems Engineering

ME/EE/MFS 526 Lean Operations Management I

ME 530 Gas Dynamics

ME 531 Fluid Dynamics I

ME 532 Advanced Strength of Materials

ME 542 Kinematic Synthesis of Mechanisms

ME 548 Aerodynamics of Turbomachinery

ME 549 Power Generation

ME/MFS/CME/MSE 554 Chemical and Physical Processing of Polymer Systems

ME/EE/MSE 555 Introduction to Micro-/Nano-Electromechanical Systems

ME/MFS/CME/MSE 556 Introduction to Composite Materials

ME 560 Engineering Optics

ME 563 Basic Combustion Phenomena

ME 565 Scale Modeling in Engineering

ME/BAE 580 Heating, Ventilating and Air-Conditioning

ME/BAE/EGR/MFS/EE 583 Industrial Energy Utilization and Assessment

ME 590 Applied CFD and Numerical Heat Transfer

ME 599 Topics in Mechanical Engineering (Subtitle required)

Non-ME Technical Electives

BAE 502 Modeling of Biological Systems

BAE 515 Fluid Power Systems

BAE 516 Control of Off-Road Vehicles

BME 440 Introduction to Biomedical Signal Processing

BME 472 Human Biomechanics

BME 473 Fundamentals of Biofluid Mechanics

BME 488 Introduction to Biomaterials

BME 532 Modeling of Physiological Systems

BME 540 Biomedical Instrumentation

BME 550 Introduction to Biomedical Imaging

BME 571 Mechanical Modeling of Human Motion

BME 573 Cell Mechanics and Mechanobiology

BME 579 Neural Engineering: Merging Engineering with Neuroscience

EGR 523 Concepts, Assessment Tools and Methods in Sustainable Power and Energy

EGR 537 Numerical Analysis

EGR 540 Power Economics and Public Policy

EGR 542 Electric Power Generation Technologies

EGR 546 Electric Power System Fundamentals

EGR 553 Environmental Consequence of Energy Production

MFS 509 Leadership for a Lean Enterprise

MFS/MNG 520 Industrial Automation and Control

MFS 581 Quality Control

MFS 599 Topics in Manufacturing Systems Engineering (Subtitle required)

MSE 201 Materials Science

MSE/CME 552 Automotive Plastics

*A minimum of 6 credit hours (two courses) must have an ME prefix or be cross-listed as an ME course. A maximum of 3 credit hours (one course) may be chosen from technical electives with prefixes other than ME. Exceptions only with the approval of the Director of Undergraduate Studies.

University of Kentucky Pigman College of Engineering

Mining Engineering 2025-2026 (Pathway from Union Commonwealth University)

UK Course Pathway	Hours	Transfer Courses	UK Course Pathway	Hours	Transfer Courses
Freshman Year - First Semester			Junior Year - First Semester		
CHE 105 General College Chemistry I*	4		EM 313 Dynamics	3	
CIS/WRD 110 Composition and Communication I*Δ	3		MNG 211 Mine Surveying	2	
EGR 101 Engineering Exploration I § †	1		MNG 301 Minerals Processing	4	
EGR 102 Fundamentals of Engineering Computing	2	<i>CIS 250</i>	MNG 335 Introduction to Mine Systems Analysis†	3	
MA 113 Calculus I*	4	<i>MATH 241</i>	MNG 463 Surface Mine Design	4	
Freshman Year - Second Semester			UK Core – Humanities	3	
CIS/WRD 111 Composition and Communication II Δ	3		Junior Year - Second Semester		
EGR 103 Engineering Exploration II § †	2		MNG 311 Electrical Circuits and Mining Machinery	3	
MA 114 Calculus II*	4	<i>MATH 242</i>	MNG 333 Principles of Fluid Mechanics and Pumping	3	
PHY 231 General University Physics*	4		MNG 371 Professional Development of Mining Engineers ∞	3	
PHY 241 General University Physics Laboratory or CHE 111 General Chemistry I Laboratory ¶§	1		MNG 435 Mine Systems Engineering and Economics	3	
UK Core – Social Sciences	3		MNG 551 Rock Mechanics	4	
Sophomore Year - First Semester			Senior Year - First Semester		
EES 220 Principles of Physical Geology	4		MNG 441 Principles of Thermodynamics and Mine Ventilation	3	
EM 221 Statics	3		MNG 451 Underground Mine Design	3	
MA 213 Calculus III*	4	<i>MATH 243</i>	MNG 580 Mineral Processing Plant Design	3	
MNG 201 Mining Engineering Fundamentals	3		MNG 591 Mine Design Project I	1	
PHY 232 General University Physics	4		UK Core – Citizenship - USA	3	
Sophomore Year - Second Semester			Senior Year - Second Semester		
EES 230 Fundamentals of Geology I	3		BAE/MNG 535 Environmental Control System Design and Reclamation	3	
EM 302 Mechanics of Deformable Solids	3		MNG 592 Mine Design Project II (UK Core – Arts and Creativity)	3	
MA 214 Calculus IV	3	<i>MATH 341</i>			
MNG 291 Elements of Mine Design	3		MNG Technical Elective**	3	
MNG 303 Deformable Solids Laboratory	1		UK Core – Global Dynamics	3	
MNG 322 Mine Safety and Health Management and Processes	2				
MNG 331 Explosives and Blasting	2				

*Courses are required for Engineering Standing. A cumulative UK GPA of at least 2.5 and successful completion of all pre-major courses. Successful completion of the following courses with at least a 2.5 GPA: CIS 110/WRD 110, CHE 105, MA 113, MA 114, MA 213, and PHY 231. If a course is repeated, the best grade will be used for calculation of GPA in the above listed courses.

Δ Students taking ENG 101 (*ENGL 100 or III*) and ENG 102 (*ENGL 112*) should also complete COM 181 (*COMM 211*), COM 252, COM 281 or COM 287.

§ Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.

† Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.

¶ Students only required to take one lab. Consult with advisor.

∞ Graduation Composition and Communication Requirement (GCCR) course.

††MNG 335 satisfies the Statistical Inferential Reasoning requirement in the UK Core.

-continued-

Mining Engineering 2025-2026 (2)

****Courses recommended as technical electives are listed below. These courses must be chosen with the approval of the student's advisor to ensure that the curriculum includes sufficient engineering design content.**

Technical Electives: Students are required to select their technical elective from the departmental courses listed below:

MNG 511 Mine Power System Design

MNG/MFS 520 Industrial Automation and Control MNG 531 Advanced Blast Design and Technology

MNG 541 Computer Design of Mine Ventilation Systems

MNG 542 Power Generation Technologies

MNG 555 Advanced Geomechanics I MNG 575 Coal Preparation Design MNG 585 Applied Surface Chemistry

MNG 599 Topic in Mining Engineering (Subtitle required)

\$ Online courses do not transfer. Chemistry labs must be in person.