University of Kentucky

Pathway for
Eastern Kentucky University
Transfers : 2021-2022

Electrical Engineering

College of Engineering

Freshman Year

First Semester	Hours
EGR 101 Engineering Exploration I § †	1
EGR 102 Fundamentals of Engineering Computing	CIS 215, CSC 160, or CSC 190...2
PHY 231 General University Physics	PHY 201...4
PHY 241 General University Physics Laboratory	PHY 201...1
CIS/WRD 110 Composition and Communication I Δ	HON 102...3
MA 113 Calculus I	MAT 121, 124, 124H or 234...4

Second Semester	
EGR 103 Engineering Exploration II § †	2
CIS/WRD 111 Composition and Communication II Δ	HON 103...3
MA 114 Calculus II	MAT 224,224H, or 244...4
CHE 105 General College Chemistry I	CHE 111...4
CS 215 Introduction to Program Design, Abstraction, and Problem Solving	4

Sophomore Year

First Semester	Hours
MA 213 Calculus III	MAT 225 or 254...4
PHY 232 General University Physics	PHY 201...4
PHY 242 General University Physics Laboratory	PHY 201...1
EE 211 Circuits I	4
EE/CPE 282 Digital Logic Design	4

Second Semester	
MA 214 Calculus IV	MAT 225H or 353...3
EE 223 AC Circuits	4
EE/CPE 287 Introduction to Embedded Systems	4
UK Core – Social Sciences	3
UK Core – Humanities	3

Junior Year

First Semester	Hours
EE 415G Electromechanics	3
EE 421G Signals and Systems	3
Elective EE Laboratory [L]	2
EE 461G Introduction to Electronics	3
MA 320 Introductory Probability **or** STA 381 Engineering Statistics – A Conceptual Approach	3
Technical Elective [T]	3

Second Semester	
EE 468G Introduction to Engineering Electromagnetics	4
Elective EE Laboratory [L]	2
Engineering/Science Elective [E]	3
Technical Elective [T]	3
UK Core – Citizenship - USA	3

Senior Year

First Semester	Hours
EE/CPE 490 ECE Capstone Design I∞	3
EE Technical Elective**	3
EE Technical Elective**	3
Math/Statistics Elective [M]	3
UK Core – Global Dynamics	3

Second Semester	
EE/CPE 491 ECE Capstone Design II	3
EE Technical Elective**	3
EE Technical Elective**	3
Engineering/Science Elective [E]	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 (ENG 101, 101R, or 105) and ENG 102 (ENG 102,102R, or 105) should also complete COM 252 (CMS 200 or SPE 200), COM 281 (CMS 310 or SPE 310), or COM 287 (CMS 205).

§ 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 (MAT 501) (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 (MAT 501), 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.

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**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 527 Electromagnetic Compatibility
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 560 Semiconductor Device Design
EE 566 Engineering Optics
EE 567 Introduction to Lasers and Masers
EE 568 Fiber Optics
EE 569 Electronic Packaging Systems and Manufacturing Processes
EE 571 Feedback Control Design
EE 572 Digital Control of Dynamic Systems
EE 582 Hardware Description Languages and Programmable Logic
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

Pathways for
Eastern Kentucky University
Transfers - 2021-2022

Materials Engineering

College of Engineering

Freshman Year

First Semester	Hours
EGR 101 Engineering Exploration I § †	1
EGR 102 Fundamentals of Engineering Computing	CIS 215, CSC 160, or CSC 190...2
CHE 105 General College Chemistry I*	CHE 111...4
CHE 111 General Chemistry I Laboratory*	CHE 111L or 115...1
CIS/WRD 110 Composition and Communication I*Δ	HON 102...3
MA 113 Calculus I *	MAT 121, 124, 124H or 234...4

Second Semester	
EGR 103 Engineering Exploration II § †	2
CIS/WRD 111 Composition and Communication II Δ	HON 103...3
MA 114 Calculus II *	MAT 224, 224H, or 244...4
PHY 231 General University Physics*	PHY 201..4
PHY 241 General University Physics Laboratory*	PHY 201...1
UK Core – Social Sciences	3

Sophomore Year

First Semester	Hours
MSE 201 Materials Science	3
MSE 202 Materials Science Laboratory	1
MA 213 Calculus III*	MAT 225 or 254...4
CHE 107 General College Chemistry II*	CHE 112...3
CHE 113 General Chemistry II Laboratory*	CHE 112L or 116...2
EM 221 Statics	PHY 221...3

Second Semester	
MSE 301 Materials Science II	3
MSE 351 Materials Thermodynamics	3
MA 214 Calculus IV	MAT 225H or 353...3
PHY 232 General University Physics	PHY 201...4
CHE 236 Survey of Organic Chemistry	3

Junior Year

First Semester	Hours
MSE 401G Metal and Alloys	3
MSE 404G Polymeric Materials	3
CME 200 Process Principles	3
EM 302 Mechanics of Deformable Solids	3
STA 381 Engineering Statistics – A Conceptual Approach	3
UK Core – Humanities	3

Second Semester	
MSE 402G Electronic Materials and Processing	3
MSE 403G Ceramic Engineering and Processing	3
MSE 407 Materials Laboratory I ∞	3
MSE 535 Mechanical Properties of Materials	3
PHY 361 Principles of Modern Physics	PHY 300 or 302...3

Senior Year

First Semester	Hours
MSE 408 Materials Laboratory II	3
MSE 436 Material Failure Analysis	3
MSE 470 Application of Materials Engineering to Design Problems	1
MSE 585 Materials Characterization Techniques	3
EE 305 Electrical Circuits and Electronics	3
Technical Elective [1]	3

Second Semester	
MSE 480 Materials Design	3
MSE 538 Metals Processing	3
Technical Elective [1]	3
UK Core – Citizenship - USA	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, 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 (ENG 101, 101R, or 105) and ENG 102 (ENG 102,102R, or 105) should also complete COM 252 (CMS 200 or SPE 200), COM 281 (CMS 310 or SPE 310), or COM 287 (CMS 205).

§ 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 and 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, 531, 552, 554, 556, 569, 599; BME 488; CHE 580 (CHE 480 or CHE 501); CME 542, 599; MA 322 (MAT 215 or 239), 422, 432G (MAT 540); ME/MFS 503

∞ Graduation Composition and Communication Requirement (GCCR) course.

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Pathway for
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Transfers : 2021-2022

Mechanical Engineering

College of Engineering

Freshman Year

First Semester — **Hours**

EGR 101 Engineering Exploration I § † *.....1
EGR 102 Fundamentals of Engineering Computing*....CIS 215, CSC 160, or CSC 190...2
CIS/WRD 110 Composition and Communication I*.....HON 102...3
MA 113 Calculus I*.....MAT 121, 124, 124H or 234...4
PHY 231 General University Physics*.....PHY 201...4
PHY 241 General University Physics Laboratory *.....PHY 201...1

Second Semester

EGR 103 Engineering Exploration II § † *.....2
MA 114 Calculus II *.....MAT 224, 224H, or 244...4
CIS/WRD 111 Composition and Communication II Δ .....HON 103...3
CHE 105 General College Chemistry I*.....CHE 111...4
UK Core ¶ – Social Sciences 3

Sophomore Year

First Semester — **Hours**

MA 213 Calculus III*.....MAT 225 or 254...4
PHY 232 General University Physics*.....PHY 202...4
PHY 242 General University Physics Laboratory*.....PHY 202...1
EM 221 Statics*.....PHY 221...3
ME 205 Computer Aided Engineering Graphics 3

Guided Elective
or
UK Core ¶ – Humanities.....3

Second Semester

ME 220 Engineering Thermodynamics I.....PHY 375...3
ME 251 Introduction to Materials and Manufacturing Processes 3
MA 214 Calculus IV .....MAT 225H or 353...3
EM 313 Dynamics 3

Guided Elective **or**
UK Core* – Humanities

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

Junior Year

First Semester — **Hours**

EM 302 Mechanics of Deformable Solids.....3
EE 305 Electrical Circuits and Electronics.....3
ME 330 Fluid Mechanics.....3
ME 340 Introduction to Mechanical Systems.....3
WRD 204 Technical Writing**.....3

Second Semester

ME 310 Engineering Experimentation I.....3
ME 321 Engineering Thermodynamics II 3
ME 325 Elements of Heat Transfer 3
ME 344 Mechanical Design.....3
Mathematics Elective***.....3

Senior Year

First Semester — **Hours**

ME 411 ME Capstone Design I 3
ME 311 Engineering Experimentation II.....3
ME 440 Design of Control Systems 3

ME 501 Mechanical Design with Finite Element Methods
or
ME 590 Computational Fluid Dynamics 3

Technical Elective††.....3

Second Semester

ME 412 ME Capstone Design II.....3
Technical Elective††.....3
Technical Elective††.....3
UK Core* – Citizenship - US 3
UK Core* – Global Dynamics 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 (ENG 101, 101R, or 105) and ENG 102 (ENG 102,102R, or 105) should also complete COM 252 (CMS 200 or SPE 200), COM 281 (CMS 310 or SPE 310), or COM 287 (CMS 205).

§ 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.

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

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

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

Mechanical Engineering • 2

Mathematics Elective **Hours**

Choose one course from the following:

MA 320 Introductory Probability....3
MA 321 Introduction to Numerical Methods....3
MA 322 Matrix Algebra and Its Applications....MAT 214 or 239....3
MA 416G Introduction to Optimization....3
MA 432G Methods of Applied Mathematics I....MAT 540....3
MA 433G Introduction to Complex Variables....MAT 550....3
MA 481G Differential Equations....3
STA 381 Engineering Statistics – A Conceptual Approach....3

Subtotal: Mathematics Elective....3

Technical Electives **Hours**

Choose 9 hours from the following:*

ME 380 Topics in Mechanical Engineering (Variable Topics)....3
ME 395 Independent Work in Mechanical Engineering....1-3
ME 416 Automotive Painting Technology....3
ME 417 Sheet Metal Forming....3
ME 418 Automotive Assembly and Quality Control....3
ME 501 Mechanical Design with Finite Element Methods....3
ME/MFS 503 Lean Manufacturing Principles and Practices....3
ME/MFS 505 Modeling of Manufacturing Processes and Machines....3
ME/MSE 506 Mechanics of Composite Materials....3
ME/MFS 507 Design for Manufacturing....3
ME 510 Vibro-Acoustic Design in Mechanical Systems....3
ME/MFS 511 Machining of Materials and Applications....3
ME/MFS 512 Manufacturing Systems....3
ME 513 Mechanical Vibrations....3
ME 514 Computational Techniques in Mechanical System Analysis....3
ME 515 Rotordynamics of Turbomachinery....3
ME 516 Systems Engineering....3
ME/EE/MFS 526 Lean Operations Management I....3
ME 527 Applied Mathematics in the Natural Sciences I....3
ME 530 Gas Dynamics....3
ME 531 Fluid Dynamics I....3
ME 532 Advanced Strength of Materials....3
ME 542 Kinematic Synthesis of Mechanisms....3
ME 548 Aerodynamics of Turbomachinery....3
ME 549 Power Generation....3
ME/MFS/CME/MSE 554 Chemical and Physical Processing of Polymer Systems....3
ME/EE/MSE 555 Introduction to Micro-/Nano-Electromechanical Systems....3
ME/MFS/CME/MSE 556 Introduction to Composite Materials....3
ME 560 Engineering Optics....3
ME 563 Basic Combustion Phenomena....3
ME 565 Scale Modeling in Engineering....3
ME/EE/MSE 570 Fundamentals of Nanoelectric Devices and Materials....3
ME/BAE 580 Heating, Ventilating and Air-Conditioning....3
ME/BAE/EGR/MFS/EE 583 Industrial Energy Utilization and Assessment....3
ME 585 Fourier Series and Boundary Value Problems....3
ME 590 Applied CFD and Numerical Heat Transfer....3
ME 599 Topics in Mechanical Engineering (Subtitle required)....3
MFS 599 Topics in Manufacturing Systems Engineering (Subtitle required)....3

Non-ME Technical Electives

BAE 502 Modeling of Biological Systems....3
BAE 515 Fluid Power Systems....3
BAE 516 Control of Off-Road Vehicles....3
BME 440 Introduction to Biomedical Signal Processing....3
BME 472 Human Biomechanics....3
BME 473 Fundamentals of Biofluid Mechanics....3
BME 488 Introduction to Biomaterials....3
BME 532 Modeling of Physiological Systems....3
BME 540 Biomedical Instrumentation....3
BME 550 Introduction to Biomedical Imaging....3
BME 571 Mechanical Modeling of Human Motion....3
BME 573 Cell Mechanics and Mechanobiology....3
BME 579 Neural Engineering: Merging Engineering with Neuroscience....3
EGR 523 Concepts, Assessment Tools and Methods in Sustainable Power and Energy....3
EGR 537 Numerical Analysis....3
EGR 540 Power Economics and Public Policy....3
EGR 542 Electric Power Generation Technologies....3
EGR 546 Electric Power System Fundamentals....3
EGR 553 Environmental Consequence of Energy Production....3
MFS 509 Leadership for a Lean Enterprise....3
MFS/MNG 520 Industrial Automation and Control....3
MFS 525 Organizational Learning for Lean Manufacturing....3
MFS 581 Quality Control....3
MFS 599 Topics in Manufacturing Systems Engineering (Subtitle required)....3
MSE 201 Materials Science....3
MSE/CME 552 Automotive Plastics....3

**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

Pathway for
Eastern Kentucky University
Transfers : 2021-2022

Mining Engineering

College of Engineering

Freshman Year

First Semester	Hours
CHE 105 General College Chemistry I*	CHE 111...4
CIS/WRD 110 Composition and Communication I*Δ	HON 102...3
EGR 101 Engineering Exploration I § †	1
EGR 102 Fundamentals of Engineering Computing	CIS 215, CSC 160, or CSC 190...2
MA 113 Calculus I*	MAT 121, 124, 124H or 234...4

Second Semester	
CIS/WRD 111 Composition and Communication II Δ	HON 103...3
EGR 103 Engineering Exploration II § †	2
MA 114 Calculus II*	MAT 224, 224H, or 244...4
PHY 231 General University Physics*	PHY 201...4
PHY 241 General University Physics Laboratory	(PHY 201)
or	
CHE 111 General Chemistry I Laboratory ¶	CHE111Lor115...1
UK Core – Social Sciences	3

Sophomore Year

First Semester	Hours
EES 220 Principles of Physical Geology	4
EM 221 Statics	PHY 375...3
MA 213 Calculus III*	MAT 225 or 254...4
MNG 201 Mining Engineering Fundamentals	3
PHY 232 General University Physics	PHY 201...4

Second Semester	
EES 230 Fundamentals of Geology I	3
EM 302 Mechanics of Deformable Solids	3
MA 214 Calculus IV	MAT 225H or 353...3
MNG 291 Elements of Mine Design	3
MNG 303 Deformable Solids Laboratory	1
MNG 322 Mine Safety and Health Management and Processes	2
MNG 331 Explosives and Blasting	2

Junior Year

First Semester	Hours
EM 313 Dynamics	3
MNG 211 Mine Surveying	2
MNG 301 Minerals Processing	3
MNG 335 Introduction to Mine Systems Analysis†	3
MNG 463 Surface Mine Design	3
UK Core – Humanities	3

Second Semester	
CE 341 Introduction to Fluid Mechanics	4
MNG 311 Electrical Circuits and Mining Machinery	3
MNG 371 Professional Development of Mining Engineers ∞	3
MNG 435 Mine Systems Engineering and Economics	3
MNG 551 Rock Mechanics	4

Senior Year

First Semester	Hours
MNG 332 Mine Plant Machinery	3
MNG 341 Mine Ventilation	3
MNG 351 Underground Mine Design	3
MNG 591 Mine Design Project I	1
UK Core – Citizenship - USA	3

Second Semester	
BAE 535/MNG 535 Environmental Control System Design and Reclamation	3
MNG 592 Mine Design Project II (UK Core – Arts and Creativity)	3
Minerals Processing Technical Elective[1]	3
Technical Elective**	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: 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 (ENG 101, 101R, or 105) and ENG 102 (ENG 102,102R, or 105) should also complete COM 252 (CMS 200 or SPE 200), COM 281 (CMS 310 or SPE 310), or COM 287 (CMS 205).

§ 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.

[1]The Minerals Processing Technical Elective is to be chosen between MNG 575, Coal Preparation Design, and MNG 580, Mineral Processing Plant Design.

∞ Graduation Composition and Communication Requirement (GCCR) course.

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

***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

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Mining Engineering Å2

MNG 555 Advanced Geomechanics I
MNG 561 Mine Construction Engineering I
MNG 575 Coal Preparation Design
MNG 580 Mineral Processing Plant Design
MNG 585 Applied Surface Chemistry
MNG 599 Topic in Mining Engineering