

Metropolitan Community College — Missouri S&T

General Engineering Transfer Guide

Effective as of Fall 2023

Complete Group 1 - Core Requirements and Group 2 - Major Requirements for major of choice.

Group 1 - Core Requirements: All Majors Take All Courses

Engineering students take all Group 1 - Core Requirements and Group 2 - Major Requirements for major of choice. Math prerequisites: While they are not part of Missouri S&T engineering degree requirements, algebra and trigonometry skills are critical to success in calculus. To prepare for entry into calculus, students should follow math placement testing and advising recommendations at their college.

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|---------------------------------------|------------------------------------|-------------|-----------------|-------------------------|--|-------------------------------------|
| MATH 180 | Analytic Geometry and Calculus I | 5 | | MATH 1214 | Calculus I | Grade of C or better is required. 4 |
| MATH 190 | Analytic Geometry and Calculus II | 5 | | MATH 1215 | Calculus II | Grade of C or better is required. 4 |
| MATH 210 | Analytic Geometry and Calculus III | 5 | | MATH 2222 | Calculus III | Grade of C or better is required. 4 |
| MATH 230 | Differential Equations | 3 | | MATH 3304 | Elementary Differential Equations | 3 |
| PHYS 220 | Engineering Physics I | 5 | | PHYSICS 1135 | Engineering Physics I | Grade of C or better is required. 4 |
| PHYS 221 | Engineering Physics II | 5 | | PHYSICS 2135 | Engineering Physics II | Grade of C or better is required. 4 |
| CHEM 111 | General College Chemistry I | 5 | | CHEM 1310, 1319 | General Chemistry I and Lab | 5 |
| ENGR 101 | Introduction to the Profession | 1 | | FR ENG 1100 | Study and Careers in Engineering and Computing | 1 |
| ENGL 101 | Composition and Reading | 3 | | ENGLISH 1120 | Exposition and Argumentation | 3 |
| ECON 211 or | Microeconomics or | 3 | | ECON 1100 or | Principles of Microeconomics or | 3 |
| ECON 210 | Macroeconomics | | | ECON 1200 | Principles of Macroeconomics | 3 |
| | | Total Hours | 40 | | | Total Hours 35 |

Group 2 - Major Requirements: Take All Courses for Major of Choice

Engineering students take all Group 1 - Core Requirements (above) and Group 2 - Major Requirements for chosen major from list below. See course requirements on following pages.

Aerospace Engineering
Architectural Engineering
Ceramic Engineering
Chemical Engineering
Chemical Engineering/Biochemistry Emphasis
Civil Engineering
Computer Engineering
Electrical Engineering

Engineering Management
Environmental Engineering
Geological Engineering
Mechanical Engineering
Metallurgical Engineering
Mining Engineering
Nuclear Engineering
Petroleum Engineering

Engineering Major Requirements are detailed on the following pages.

Free Electives: Some programs allow Free Electives as indicated within each major. Free Electives should be selected in consultation with your advisor and may not include remedial/deficiency courses, algebra, trigonometry, pre-calculus, or extra credits in required courses.

Humanities/Social Science (HSS) Electives: HSS electives may include any art, English and technical communication, etymology, foreign language, music, philosophy, speech and media studies, or theatre. Your campus may have additional acceptable options. Consult with your advisor or email transfer@mst.edu with questions. See Missouri S&T online catalog at <https://catalog.mst.edu/undergraduate/degreeprogramsandcourses/> for more information.

Aerospace Engineering Group 2 Major Requirements

| Metropolitan Community College | | | Semester | Missouri S&T | | |
|--------------------------------|--|----|----------|------------------|--|----|
| ENGR 113 | Engineering Design & Microcomputer Applications | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| HIST 134 or | Modern Wesern Civilization or | | | HISTORY 1200 or | Modern Western Civilization or | |
| HIST 120 or | United States History to 1865 or | 3 | | HISTORY 1300 or | American History to 1877 or | 3 |
| HIST 121 or | United States History since 1865 or | | | HISTORY 1310 or | American History since 1877 or | |
| POLS 136 | Introduction to American Politics | | | POL SCI 1200 | American Government | |
| ENGL 102 or | Composition and Reading II or | | | ENGLISH 1160 or | Writing and Research or | |
| COMM 100 or | Fundamentals of Speech or | 3 | | SPMS 1185 or | Principles of Speech or | 3 |
| ENGL 215 | Technical Writing | | | ENGLISH 3560 | Technical Writing | |
| CSIS 123 or | Programming Fundamentals or | 3 | | CS 1971, 1981 or | Intro to Programming Method and Lab (C++) (3) or | 3 |
| ENGR 204 | Programming for Engineers and Scientists | | | CS 1972, 1982 | Intro to MATLAB Programming and Lab (3) | |
| ENGR 233 | Circuit Analysis I | 4 | | EE 2800 | Circuit Analysis I | 3 |
| ENGR 229 | Statics | 3 | | CIV ENG 2200 | Engineering Mechanics-Statics | 3 |
| ENGR 230 | Dynamics | 3 | | AERO ENG 2360 | Dynamics | 3 |
| ENGR 223 | Thermodynamics and Heat Transfer | 4 | | MECH ENG 2519 | Thermodynamics | 3 |
| ENGR 240 | Mechanics of Materials | 3 | | CIV ENG 2210 | Mechanics of Materials | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics (Will satisfy the Advanced Math/Comp Sci elective requirement.) | 3 |
| ENGL 220 or | British Literature to 1750 or | | | ENGLISH 1211 or | British Literature I: The Beginnings to 1800 or | |
| ENGL 222 or | American Literature I or | | | ENGLISH 1221 or | American Literature: 1600 to 1865 or | |
| ENGL 254 or | World Literature I or | | | ENGLISH 1231 or | World Literature I or | |
| ENGL 260 or | African-American Literature or | 3 | | ENGLISH 2242 or | Literature by Women or | 3 |
| ENGL 262/268 | Women's Lives and Autobiography/Women's Literature (or other literature elective) | | | ENGLISH 2245 or | African American Literature (or other literature elective) | |
| | Ethics Elective Engineering, business, bio, social or other ethics approved by advisor. | 3 | | | Ethics Elective Engineering, business, bio, social or other ethics approved by advisor. | 3 |
| | <i>No free electives applied to the degree.</i> | 0 | | | Maximum Free Electives | 0 |
| | Group 2 Major Requirements | 38 | | | Group 2 Major Requirements | 36 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | Total Hours | 78 | | | Total Hours* | 71 |

*S&T advisor permission is required to transfer more than 68 credits toward the S&T Aerospace Engineering degree.

Architectural Engineering Group 2 Major Requirements

| Metropolitan Community College | | | Semester | Missouri S&T | | |
|--------------------------------|--|----|----------|-----------------------------|--|----|
| ENGR 113 | Engineering Design & Microcomputer Applications | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| HIST 134* | Modern Wesern Civilization* | | | HISTORY 1200* | Modern Western Civilization* | |
| (or HIST 120 or | (or American History I or | 3 | | (or HISTORY 1300 or | (or American History to 1877 or | 3 |
| HIST 121) | American History II) | | | HISTORY 1310) | American History since 1877) | |
| | *HIST 134 is preferred; 120 or 121 will be accepted. | | | | *HISTORY 1200 is preferred; 1300 or 1310 will also be accepted. | |
| ENGR 229 | Statics | 3 | | CIV ENG 2200 | Engineering Mechanics-Statics | 3 |
| ENGR 230 | Dynamics | 3 | | MECH ENG 2350 | Engineering Mechanics-Dynamics | 2 |
| ENGR 240 | Mechanics of Materials | 3 | | CIV ENG 2210 | Mechanics of Materials | 3 |
| SRVY 135 | Elementary Surveying | 3 | | CIV ENG 2401 | Fundamentals of Surveying | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics (Will be substituted for STAT 3113.) | 3 |
| HSS Elective | Humanities/Social Science Elective: history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language | 3 | | HSS Elective | Humanities/Social Science Elective: history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language | 3 |
| GEOI 101 | Physical Geology | 5 | | GEOLOGY 1110 (GEO ENG 1150) | Physical and Environmental Geology | 3 |
| ENGR 223 | Thermodynamics and Heat Transfer | 4 | | MECH ENG 2527 | Thermal Analysis | 3 |
| | <i>No free electives applied to the degree.</i> | 0 | | | Maximum Free Electives | 0 |
| | Group 2 Major Requirements | 33 | | | Group 2 Major Requirements | 29 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | Total Hours | 73 | | | Total Hours* | 64 |

*S&T advisor permission is required to transfer more than 69 credits toward the S&T Architectural Engineering degree.

Ceramic Engineering Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|---|---|----|-----------------|---|---|----|
| ENGR 113 | Engineering Design & Microcomputer Applications | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| HIST 134 or HIST 120 or HIST 121 or POLS 136 | Modern Western Civilization or United States History to 1865 or United States History since 1865 or Introduction to American Politics | 3 | | HISTORY 1200 or HISTORY 1300 or HISTORY 1310 or POL SCI 1200 | Modern Western Civilization or American History to 1877 or American History since 1877 or American Government | 3 |
| ENGR 229 | Statics | 3 | | CIV ENG 2200 | Engineering Mechanics-Statics | 3 |
| ENGR 240 | Mechanics of Materials | 3 | | CIV ENG 2210 | Mechanics of Materials | 3 |
| CHEM 221 | Organic Chemistry I | 5 | | CHEM 2210 | Organic Chemistry I (Will satisfy the advanced chemistry elective requirement.) | 4 |
| CHEM 112 | General College Chemistry II | 5 | | CHEM 1320 | General Chemistry II | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics (or any statistics course 3000-level or higher. Satisfies statistics elective requirement.) | 3 |
| ENGL 102 or COMM 100 or HSS Elective | Composition and Reading II or Fundamentals of Speech or Humanities/Social Science Elective: history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language | 3 | | ENGLISH 1160 or SPMS 1185 or HSS Elective | Writing and Research or Public Speaking or Humanities/Social Science Elective: history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | <i>No free electives applied to the degree.</i> | 0 | | | Maximum Free Electives | 0 |
| | Group 2 Major Requirements | 31 | | | Group 2 Major Requirements | 28 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | Total Hours | 71 | | | Total Hours* | 63 |

*S&T advisor permission is required to transfer more than 68 credits toward the S&T Ceramic Engineering degree.

Chemical Engineering Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|---|---|----|-----------------|---|---|----|
| ENGR 113 | Engineering Design & Microcomputer Applications | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| ENGL 215 | Technical Writing | 3 | | ENGLISH 3560 | Technical Writing | 3 |
| HIST 134 or HIST 120 or HIST 121 or POLS 136 | Modern Western Civilization or United States History to 1865 or United States History since 1865 or Introduction to American Politics | 3 | | HISTORY 1200 or HISTORY 1300 or HISTORY 1310 or POL SCI 1200 | Modern Western Civilization or American History to 1877 or American History since 1877 or American Government | 3 |
| CHEM 112 | General College Chemistry II | 5 | | CHEM 1320 | General Chemistry II | 3 |
| CHEM 221 | Organic Chemistry I | 5 | | CHEM 2210, 2219* | Organic Chemistry I (3) and Lab*(1) *The lab is not required for the degree, will satisfy 1 of 9 required hours of science electives. | 3 |
| CHEM 222 | Organic Chemistry II | 5 | | CHEM 2220, 2229* | Organic Chemistry II (3) and Lab* (1) CHEM 2220 Will satisfy 3 of 9 required hours of science electives CHEM 2229 is not required for the degree, will transfer as general credit. | 4 |
| BIOL 208 | Microbiology | 5 | | BIO SCI 3313, 3319 | Microbiology and Lab (5) Will satisfy 5 of 9 required hours of science electives. | 5 |
| CSIS 223 or CSIS 271 or CSIS 123 or ENGR 204 | Object-Oriented Programming With C++ or Data Structures and Algorithm Analysis or Programming Fundamentals or Programming for Engineers and Scientists | 3 | | CS 1500 or CS 1972, 1982 | Computational Problem Solving or Intro to MATLAB Programming and Lab | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics (Will be substituted for STAT 3113.) | 3 |
| ENGR 223 | Thermodynamics and Heat Transfer | 4 | | MECH ENG 2519* | Thermodynamics* *The combination of MECH ENG 2519 AND CHEM ENG 4000 (an independent study, online S&T course) will be substituted for CHEM ENG 2110 by the chemical engineering department. Students must complete both courses to receive credit. | 3 |
| COMM 100 | Fundamentals of Speech | 3 | | SP&MS 1185 | Principles of Speech | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | <i>No free electives applied to the degree.</i> | 0 | | | Maximum Free Electives | 0 |
| | Group 2 Major Requirements | 45 | | | Group 2 Major Requirements | 39 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | Total Hours | 85 | | | Total Hours* | 74 |

*S&T advisor permission is required to transfer more than 68 credits toward the S&T Chemical Engineering degree.

Chemical Engineering - Biochemical Engineering Emphasis Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|---|---|----|-----------------|---|--|----|
| ENGR 113 | Engineering Design & Microcomputer Applications | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| ENGL 215 | Technical Writing | 3 | | ENGLISH 3560 | Technical Writing | 3 |
| HIST 134 or HIST 120 or HIST 121 or POLS 136 | Modern Western Civilization or United States History to 1865 or United States History since 1865 or Introduction to American Politics | 3 | | HISTORY 1200 or HISTORY 1300 or HISTORY 1310 or POL SCI 1200 | Modern Western Civilization or American History to 1877 or American History since 1877 or American Government | 3 |
| CHEM 112 | General College Chemistry II | 5 | | CHEM 1320 | General Chemistry II | 3 |
| CHEM 221 | Organic Chemistry I | 5 | | CHEM 2210, 2219* | Organic Chemistry I (3) and Lab*(1) *The lab is not required for the degree, will satisfy 1 of 9 required hours of science electives. | 3 |
| CHEM 222 | Organic Chemistry II | 5 | | CHEM 2220, 2229* | Organic Chemistry II (3) and Lab* (1) CHEM 2220 Will satisfy 3 of 9 required hours of science electives CHEM 2229 is not required for the degree, will transfer as general credit. | 4 |
| BIOL 208 | Microbiology | 5 | | BIO SCI 3313, 3319 | Microbiology and Lab (5) Will satisfy 5 of 9 required hours of science electives . | 5 |
| CSIS 223 or CSIS 271 or CSIS 123 or ENGR 204 | Object-Oriented Programming With C++ or Data Structures and Algorithm Analysis or Programming Fundamentals or Programming for Engineers and Scientists | 3 | | CS 1500 or CS 1972, 1982 | Computational Problem Solving or Intro to MATLAB Programming and Lab | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics (Will be substituted for STAT 3113.) Thermodynamics* | 3 |
| ENGR 223 | Thermodynamics and Heat Transfer | 4 | | MECH ENG 2519* | *The combination of MECH ENG 2519 AND CHEM ENG 4000 (an independent study, online S&T course) will be substituted for CHEM ENG 2110 by the chemical engineering department. Students must complete both courses to receive credit. | 3 |
| COMM 100 | Fundamentals of Speech | 3 | | SP&MS 1185 | Principles of Speech | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | <i>No free electives applied to the degree.</i> | 0 | | | Maximum Free Electives | 0 |
| | Group 2 Major Requirements | 45 | | | Group 2 Major Requirements | 39 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | Total Hours | 85 | | | Total Hours* | 74 |

*S&T advisor permission is required to transfer more than 70 credits toward the S&T Chemical/Biochemical Engineering degree.

Civil Engineering Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|---|--|----|-----------------|---|--|----|
| ENGR 113 | Engineering Design & Microcomputer Applications | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| ENGL 102 or COMM 100 or ENGL 215 | Composition and Reading II or Fundamentals of Speech or Technical Writing | 3 | | ENGLISH 1160 or SPMS 1185 or ENGLISH 3560 | Writing and Research or Public Speaking or Technical Writing | 3 |
| HIST 134 or HIST 120 or HIST 121 or POLS 136 | Modern Western Civilization or United States History to 1865 or United States History since 1865 or Introduction to American Politics | 3 | | HISTORY 1200 or HISTORY 1300 or HISTORY 1310 or POL SCI 1200 | Modern Western Civilization or American History to 1877 or American History since 1877 or American Government | 3 |
| GEO 101 | Physical Geology | 5 | | GEOLOGY 1110 (GEO ENG 1150) | Physical and Environmental Geology | 3 |
| ENGR 229 | Statics | 3 | | CIV ENG 2200 | Engineering Mechanics-Statics | 3 |
| ENGR 230 | Dynamics | 3 | | MECH ENG 2350 | Engineering Mechanics-Dynamics | 2 |
| ENGR 240 | Mechanics of Materials | 3 | | CIV ENG 2210 | Mechanics of Materials | 3 |
| SRVY 135 | Elementary Surveying | 3 | | CIV ENG 2401 | Fundamentals of Surveying | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics (Will be substituted for STAT 3113.) Humanities/Social Science Elective | 3 |
| | Humanities/Social Science Elective | 3 | | | Maximum Free Electives | 0 |
| | <i>No free electives applied to the degree.</i> | 0 | | | Group 2 Major Requirements | 29 |
| | Group 2 Major Requirements | 32 | | | Group 1 Core Requirements | 35 |
| | Group 1 Core Requirements | 40 | | | Total Hours* | 64 |
| | Total Hours | 72 | | | | |

*S&T advisor permission is required to transfer more than 69 credits toward the S&T Civil Engineering degree.

Computer Engineering Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|--|---|----|-----------------|--|---|----|
| COMM 100 | Fundamentals of Speech | 3 | | SPMS 1185 | Public Speaking | 3 |
| ENGL 102 or ENGL 215 | Composition and Reading II or Technical Writing | 3 | | ENGLISH 1160 or ENGLISH 3560 | Writing and Research or Technical Writing | 3 |
| HIST 134 or HIST 120 or HIST 121 or POLS 136 | Modern Wesern Civilization or United States History to 1865 or United States History since 1865 or Introduction to American Politics | 3 | | HISTORY 1200 or HISTORY 1300 or HISTORY 1310 or POL SCI 1200 | Modern Western Civilization or American History to 1877 or American History since 1877 or American Government | 3 |
| MATH 141 | Discrete Structures for Comp Sci I | 3 | | CS 1200 | Discrete Math for Computer Science | 3 |
| CSIS 223 or CSIS 271 | Object-Oriented Programming with C++ or Data Structures and Algorithm Analysis | 3 | | CS 1500 | Computational Problem Solving | 3 |
| ENGR 229 or ENGR 230 or ENGR 223 or CHEM 221 or BIOL 214 | Statics (3) or Dynamics (3) Thermodynamics and Heat Transfer (4) or Organic Chemistry I (5) or Principles of Genetics (4) | 3 | | CIV ENG 2200 or MECH ENG 2350 or MECH ENG 2519 or CHEM 2210 or BIO SCI 2223 | Engineering Mechanics-Statics (3) or Engineering Mechanics-Dynamics (2) or Thermodynamics (3) or Organic Chemistry I (4)or General Genetics (3) | 3 |
| ENGR 233 | Circuit Analysis I | 4 | | EE 2100** | Circuits I **A passing grade on the Missouri S&T EE Advancement Exam I is required to receive credit for EE 2100. | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics (Will be substituted for STAT 3117.) | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | Maximum Free Electives | 3 | | | Maximum Free Electives | 3 |
| | Group 2 Major Requirements | 31 | | | Group 2 Major Requirements | 30 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | Total Hours | 71 | | | Total Hours* | 65 |
| | | | | *S&T advisor permission is required to transfer more than 68 credits toward the S&T Computer Engineering degree. | | |

*S&T advisor permission is required to transfer more than 68 credits toward the S&T Computer Engineering degree.

Electrical Engineering Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|--|--|----|-----------------|-------------------------------|---|----|
| ENGR 113 | Engineering Design & Microcomputer Applications | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| COMM 100 | Fundamentals of Speech | 3 | | SPMS 1185 | Public Speaking | 3 |
| ENGL 102 or | Composition and Reading II or | 3 | | ENGLISH 1160 or | Writing and Research or | 3 |
| ENGL 215 | Technical Writing | | | ENGLISH 3560 | Technical Writing | |
| HIST 134 or | Modern Wesern Civilization or | 3 | | HISTORY 1200 or | Modern Western Civilization or | 3 |
| HIST 120 or | United States History to 1865 or | | | HISTORY 1300 or | American History to 1877 or | |
| HIST 121 or | United States History since 1865 or | | | HISTORY 1310 or | American History since 1877 or | |
| POLS 136 | Introduction to American Politics | | | POL SCI 1200 | American Government | |
| CSIS 223 or | Object-Oriented Programming with C++ or | 3 | | CS 1500 | Computational Problem Solving | 3 |
| CSIS 271 | Data Structures and Algorithm Analysis | | | | | |
| ENGR 229 and | Statics (3) and | 4 | | CIV ENG 2200 and | Engineering Mechanics-Statics (3) and | 3 |
| ENGR 230 | Dynamics (3) | | | MECH ENG 2350 | Engineering Mechanics-Dynamics (3) | |
| (BOTH of the courses above or | (Both courses above combined or any one of the following courses | | | (BOTH of the courses above or | (Both courses above combined or any one of the following courses will satisfy | |
| ONE of the courses below.) | will satisfy a required engineering science elective.) | | | ONE of the courses below.) | a required engineering science elective.) | |
| OR | OR | | | OR | OR | |
| ENGR 223 or | Thermodynamics and Heat Transfer (4) or | | | MECH ENG 2519 or | Thermodynamics (3) or | |
| CHEM 221 or | Organic Chemistry I (5) or | | CHEM 2210 or | Organic Chemistry I (4) or | | |
| BIOL 214 | Principles of Genetics (4) | | BIO SCI 2223 | General Genetics (3) | | |
| ENGR 233 | Circuit Analysis I | 4 | | EE 2100** | Circuits I **A passing grade on the Missouri S&T EE Advancement Exam I is required to receive credit for EE 2100. | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics (Will be substituted for STAT 3117.) | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | Maximum Free Electives | 3 | | | Maximum Free Electives | 3 |
| | Group 2 Major Requirements | 32 | | | Group 2 Major Requirements | 30 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | Total Hours | 72 | | | Total Hours* | 65 |
| *S&T advisor permission is required to transfer more than 68 credits toward the S&T Electrical Engineering degree. | | | | | | |

*S&T advisor permission is required to transfer more than 68 credits toward the S&T Electrical Engineering degree.

Engineering Management Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|---------------------------------------|---|----|-----------------|-------------------------|--|----|
| ENGR 113 | Engineering Design & Microcomputer Applications | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| PSYC 140 | General Psychology | 3 | | PSYCH 1101 | General Psychology | 3 |
| HIST 134 or | Modern Western Civilization or | | | HISTORY 1200 or | Modern Western Civilization or | |
| HIST 120 or | United States History to 1865 or | | | HISTORY 1300 or | American History to 1877 or | |
| HIST 121 or | United States History since 1865 or | 3 | | HISTORY 1310 or | American History since 1877 or | 3 |
| POLS 136 | Introduction to American Politics | | | POL SCI 1200 | American Government | |
| COMM 100 | Fundamentals of Speech | 3 | | SPMS 1185 | Principles of Speech | 3 |
| ENGL 102 or | Composition and Reading II or | | | ENGLISH 1160 or | Writing and Research or | |
| ENGL 215 | Technical Writing | 3 | | ENGLISH 3560 | Technical Writing | 3 |
| CSIS 123 or | Programming Fundamentals or | | | CS 1971, 1981 or | Intro to Programming Method and Lab (C++) or | |
| CSIS 223 or | Object-Oriented Programming in C++ or | | | CS 1972, 1982 | Intro to MATLAB Programming and Lab | 3 |
| ENGR 204 | Programming for Engineers and Scientists | 3 | | | | |
| ENGR 233 | Circuit Analysis I | 4 | | EE 2800 | Circuit Analysis I | 3 |
| ENGR 229 | Statics | 3 | | CIV ENG 2200 | Engineering Mechanics-Statics | 3 |
| ENGR 230 | Dynamics | 3 | | MECH ENG 2350 | Engineering Mechanics-Dynamics | 2 |
| ENGR 223 | Thermodynamics and Heat Transfer | 4 | | MECH 2527 | Thermal Analysis | 3 |
| ENGR 240 | Mechanics of Materials | 3 | | CIV ENG 2210 | Mechanics of Materials | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | Maximum Free Electives | 3 | | | Maximum Free Electives | 3 |
| | Group 2 Major Requirements | 44 | | | Group 2 Major Requirements | 41 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | Total Hours | 84 | | | Total Hours* | 76 |

*S&T advisor permission is required to transfer more than 68 credits toward the S&T Engineering Management degree.

Environmental Engineering Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|---------------------------------------|---|----|-----------------|--------------------------------|---|----|
| ENGR 113 | Engineering Design & Microcomputer Applications | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| ENGL 102 or | Composition and Reading II or | | | ENGLISH 1160 or | Writing and Research or | |
| COMM 100 or | Fundamentals of Speech or | 3 | | SPMS 1185 or | Public Speaking or | 3 |
| ENGL 215 | Technical Writing | | | ENGLISH 3560 | Technical Writing | |
| HIST 120 or | American History I or | | | HISTORY 1300 or | American History to 1877 or | |
| HIST 121 or | American History II or | 3 | | HISTORY 1310 or | American History since 1877 or | 3 |
| HIST 134 | Modern Western Civilization | | | HISTORY 1200 | Modern Western Civilization | |
| GEO 101 | Physical Geology | 5 | | GEOLOGY 1110 (GEO ENG 1150) | Physical and Environmental Geology | 3 |
| CHEM 112 | General College Chemistry II | 5 | | CHEM 1320 | General Chemistry II | 3 |
| BIOL 101 | General Biology | 5 | | BIO SCI 1113 | General Biology | 4 |
| ENGR 229 | Statics | 3 | | CIV ENG 2200 | Engineering Mechanics-Statics | 3 |
| ENGR 230 | Dynamics | 3 | | MECH ENG 2350 | Engineering Mechanics-Dynamics | 2 |
| ENGR 240 | Mechanics of Materials | 3 | | CIV ENG 2210 | Mechanics of Materials | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics (Will be substituted for STAT 3113.) | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | No free electives applied to the degree. | 0 | | | Maximum Free Electives | 0 |
| | Group 2 Major Requirements | 39 | | | Group 2 Major Requirements | 33 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | Total Hours | 79 | | | Total Hours* | 68 |

*S&T advisor permission is required to transfer more than 69 credits toward the S&T Environmental Engineering degree.

Geological Engineering Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|---|--|-------------|-----------------|---|--|-----------------|
| ENGR 113 | Engineering Design & Microcomputer Applications | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| ENGL 215 | Technical Writing | 3 | | ENGLISH 3560 | Technical Writing | 3 |
| HIST 134 or HIST 120 or HIST 121 or POLS 136 | Modern Western Civilization or United States History to 1865 or United States History since 1865 or Introduction to American Politics | 3 | | HISTORY 1200 or HISTORY 1300 or HISTORY 1310 or POL SCI 1200 | Modern Western Civilization or American History to 1877 or American History since 1877 or American Government | 3 |
| GEO 101 | Physical Geology | 5 | | GEO ENG 1150 (GEOLOGY 1110) | Physical and Environmental Geology | 3 |
| ENGR 229 | Statics | 3 | | CIV ENG 2200 | Engineering Mechanics-Statics | 3 |
| ENGR 230 | Dynamics | 3 | | MECH ENG 2350 | Engineering Mechanics-Dynamics | 2 |
| ENGR 240 | Mechanics of Materials | 3 | | CIV ENG 2210 | Mechanics of Materials | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics (Will satisfy the Advanced Math/Comp Sci elective requirement.) | 3 |
| BIOL 101 or CHEM 112 or CHEM 221 | General Biology or General Chemistry II or Organic Chemistry I <i>or any 3+-hour course in chemistry, geochemistry, or biology</i> | 5 | | BIO SCI 1113 or CHEM 1320 or CHEM 2210 | General Biology or General Chemistry II or Organic Chemistry I <i>or any 3-hour course in chemistry, geochemistry, or biology. Satisfies chemistry/geochemistry elective requirement.</i> | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | <i>No free electives applied to the degree.</i> | 0 | | | Maximum Free Electives | 0 |
| | Group 2 Major Requirements | 37 | | | Group 2 Major Requirements | 32 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | | Total Hours | 77 | | | Total Hours* 67 |

*S&T advisor permission is required to transfer more than 68 credits toward the S&T Geological Engineering degree.

Mechanical Engineering Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|--|--|-------------|-----------------|---|--|-----------------|
| ENGR 113 | Engineering Design & Microcomputer Appl | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| HIST 134 or HIST 120 or HIST 121 or POLS 136 | Modern Western Civilization or United States History to 1865 or United States History since 1865 or Introduction to American Politics | 3 | | HISTORY 1200 or HISTORY 1300 or HISTORY 1310 or POL SCI 1200 | Modern Western Civilization or American History to 1877 or American History since 1877 or American Government | 3 |
| ENGL 102 or COMM 100 or ENGL 215 | Composition and Reading II or Fundamentals of Speech or Technical Writing | 3 | | ENGLISH 1160 or SPMS 1185 or ENGLISH 3560 | Writing and Research or Principles of Speech or Technical Writing | 3 |
| CSIS 123 or CSIS 223 or ENGR 204 | Programming Fundamentals or Object-Oriented Programming in C++ or Programming for Engineers and Scientists | 3 | | CS 1971, 1981 or CS 1972, 1982 | Intro to Programming Method and Lab (C++) or Intro to MATLAB Programming and Lab | 3 |
| ENGR 233 | Circuit Analysis I | 4 | | EE 2800 | Circuit Analysis I | 3 |
| ENGR 229 | Statics | 3 | | CIV ENG 2200 | Engineering Mechanics-Statics | 3 |
| ENGR 230 | Dynamics | 3 | | MECH ENG 2360 | Dynamics | 3 |
| ENGR 223 | Thermodynamics and Heat Transfer | 4 | | MECH ENG 2519 | Thermodynamics | 3 |
| ENGR 240 | Mechanics of Materials | 3 | | CIV ENG 2210 | Mechanics of Materials | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics (Will satisfy the Advanced Math/Comp Sci elective requirement.) | 3 |
| ENGL 220 or ENGL 222 or ENGL 254 or ENGL 260 or ENGL 262/268 | British Literature to 1750 or American Literature I or World Literature I or African-American Literature or Women's Lives and Autobiography/Women's Literature <i>(or other literature elective)</i> | 3 | | ENGLISH 1211 or ENGLISH 1221 or ENGLISH 1231 or ENGLISH 2242 or ENGLISH 2245 or | British Literature I: The Beginnings to 1800 or American Literature: 1600 to 1865 or World Literature I or Literature by Women or African American Literature <i>(or other literature elective)</i> | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | <i>No free electives applied to the degree.</i> | 0 | | | Maximum Free Electives | 0 |
| | Group 2 Major Requirements | 38 | | | Group 2 Major Requirements | 36 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | | Total Hours | 78 | | | Total Hours* 71 |

*S&T advisor permission is required to transfer more than 68 credits toward the S&T Mechanical Engineering degree.

Metallurgical Engineering Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|---|---|-------------|-----------------|---|--|-----------------|
| ENGR 113 | Engineering Design & Microcomputer Appl | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| ENGL 102 or COMM 100 or ENGL 215 | Composition and Reading II or Fundamentals of Speech or Technical Writing | 3 | | ENGLISH 1160 or SPMS 1185 or ENGLISH 3560 | Writing and Research or Public Speaking or Technical Writing | 3 |
| HIST 134 or HIST 120 or HIST 121 or POLS 136 | Modern Wesern Civilization or United States History to 1865 or United States History since 1865 or Introduction to American Politics | 3 | | HISTORY 1200 or HISTORY 1300 or HISTORY 1310 or POL SCI 1200 | Modern Western Civilization or American History to 1877 or American History since 1877 or American Government | 3 |
| ENGR 229 | Statics | 3 | | CIV ENG 2200 | Engineering Mechanics-Statics | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics | 3 |
| ENGR 240 | Mechanics of Materials | 3 | | CIV ENG 2210 | Mechanics of Materials | 3 |
| CHEM 112 | General College Chemistry II | 5 | | CHEM 1320 | General Chemistry II | 3 |
| CHEM 221 or ENGR 233 | Organic Chemistry 1 or Circuit Analysis I | 4 | | CHEM 2210 or EE 2800 | Organic Chemistry I or Electrical Circuits | 3 |
| | | | | <i>Not specifically required for the degree but will satisfy Out-of-Department Technical Elective Requirement</i> | | |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | <i>See your advisor for course options.</i> | 3 | | | Maximum Free Electives | 3 |
| | Group 2 Major Requirements | 36 | | | Group 2 Major Requirements | 33 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | | Total Hours | 76 | | | Total Hours* 68 |

*S&T advisor permission is required to transfer more than 68 credits toward the S&T Metallurgical Engineering degree.

Mining Engineering Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|---|---|-------------|-----------------|---|--|-----------------|
| ENGR 113 | Engineering Design & Microcomputer Appl | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| ENGL 102 or ENGL 215 | Composition and Reading II or Technical Writing | 3 | | ENGLISH 1160 or ENGLISH 3560 | Writing and Research or Technical Writing | 3 |
| HIST 134 or HIST 120 or HIST 121 or POLS 136 | Modern Wesern Civilization or United States History to 1865 or United States History since 1865 or Introduction to American Politics | 3 | | HISTORY 1200 or HISTORY 1300 or HISTORY 1310 or POL SCI 1200 | Modern Western Civilization or American History to 1877 or American History since 1877 or American Government | 3 |
| MATH 215 | Engineering Statistics and Computations | 3 | | STAT 3115 | Engineering Statistics | 3 |
| ENGR 229 | Statics | 3 | | CIV ENG 2200* | Engineering Mechanics-Statics | 3 |
| ENGR 230 | Dynamics | 3 | | MECH ENG 2350 | Engineering Mechanics-Dynamics | 2 |
| ENGR 223 | Thermodynamics and Heat Transfer | 4 | | MECH ENG 2527 | Thermal Analysis | 3 |
| ENGR 240 | Mechanics of Materials | 3 | | CIV ENG 2210 | Mechanics of Materials | 3 |
| GEO 101 | Physical Geology | 5 | | GEOLOGY 1110 (GEO ENG 1150) | Physical and Environmental Geology | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | <i>No free electives applied to the degree.</i> | 0 | | | Maximum Free Electives | 0 |
| | Group 2 Major Requirements | 36 | | | Group 2 Major Requirements | 32 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | | Total Hours | 76 | | | Total Hours* 67 |

*S&T advisor permission is required to transfer more than 68 credits toward the S&T Mining Engineering degree.

Nuclear Engineering Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|---|---|----|---|--|----|--|
| ENGR 113 | Engineering Design & Microcomputer Appl | 3 | MECH ENG 1720 | Engineering Design with Computer Appl | 3 | |
| ENGL 102 or COMM 100 or ENGL 215 | Composition and Reading II or Fundamentals of Speech or Technical Writing | 3 | ENGLISH 1160 or SPMS 1185 or ENGLISH 3560 | Writing and Research or Public Speaking or Technical Writing | 3 | |
| HIST 134 or HIST 120 or HIST 121 or POLS 136 | Modern Wesern Civilization or United States History to 1865 or United States History since 1865 or Introduction to American Politics | 3 | HISTORY 1200 or HISTORY 1300 or HISTORY 1310 or POL SCI 1200 | Modern Western Civilization or American History to 1877 or American History since 1877 or American Government | 3 | |
| CSIS 123 or ENGR 204 | Programming Fundamentals or Programming for Engineers and Scientists | 3 | CS 1971, 1981 or CS 1972, 1982 | Intro to Programming Method and Lab (C++) (3) or Intro to MATLAB Programming and Lab (3) | 3 | |
| ENGR 229 | Statics | 3 | CIV ENG 2200 | Engineering Mechanics-Statics | 3 | |
| ENGR 240 | Mechanics of Materials | 3 | CIV ENG 2210 | Mechanics of Materials | 3 | |
| MATH 215 | Engineering Statistics and Computations | 3 | STAT 3115 | Engineering Statistics | 3 | |
| ENGR 233 | Circuit Analysis I | 4 | EE 2800 | Circuit Analysis I | 3 | |
| ENGR 223 | Thermodynamics and Heat Transfer | 4 | MECH ENG 2519 | Thermodynamics | 3 | |
| | Humanities/Social Science Elective | 3 | | Humanities/Social Science Elective | 3 | |
| | Humanities/Social Science Elective | 3 | | Humanities/Social Science Elective | 3 | |
| | <i>See your advisor for course options.</i> | 6 | | Maximum Free Electives | 6 | |
| | Group 2 Major Requirements | 41 | | Group 2 Major Requirements | 39 | |
| | Group 1 Core Requirements | 40 | | Group 1 Core Requirements | 35 | |
| Total Hours | | 81 | Total Hours* | | 74 | |
| *S&T advisor permission is required to transfer more than 68 credits toward the S&T Nuclear Engineering degree. | | | | | | |

Petroleum Engineering Group 2 Major Requirements

| <u>Metropolitan Community College</u> | | | <u>Semester</u> | <u>Missouri S&T</u> | | |
|---|---|----|-----------------|---|--|----|
| ENGR 113 | Engineering Design & Microcomputer Appl | 3 | | MECH ENG 1720 | Engineering Design with Computer Appl | 3 |
| ENGL 215 or ENGL 102 | Technical Writing or Composition and Reading II | 3 | | ENGLISH 3560 or ENGLISH 1160 | Technical Writing (preferred) or Writing and Research or | 3 |
| HIST 134 or HIST 120 or HIST 121 or POLS 136 | Modern Wesern Civilization or United States History to 1865 or United States History since 1865 or Introduction to American Politics | 3 | | HISTORY 1200 or HISTORY 1300 or HISTORY 1310 or POL SCI 1200 | Modern Western Civilization or American History to 1877 or American History since 1877 or American Government | 3 |
| ENGR 204 | Programming for Engineers and Scientists | 3 | | CS 1972, 1982 | Intro to Programming Method and Lab (C++) | 3 |
| GEO 101 | Physical Geology | 5 | | GEOLOGY 1110 (GEO ENG 1150) | Physical and Environmental Geology | 3 |
| ENGR 229 | Statics | 3 | | CIV ENG 2200 | Engineering Mechanics-Statics | 3 |
| ENGR 230 | Dynamics | 3 | | MECH ENG 2350 | Engineering Mechanics-Dynamics | 2 |
| ENGR 240 | Mechanics of Materials | 3 | | CIV ENG 2210 | Mechanics of Materials | 3 |
| ENGR 223 | Thermodynamics and Heat Transfer | 4 | | MECH ENG 2527 | Thermal Analysis | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | Humanities/Social Science Elective | 3 | | | Humanities/Social Science Elective | 3 |
| | <i>No free electives applied to the degree.</i> | 0 | | | Maximum Free Electives | 0 |
| | Group 2 Major Requirements | 36 | | | Group 2 Major Requirements | 32 |
| | Group 1 Core Requirements | 40 | | | Group 1 Core Requirements | 35 |
| | Total Hours | 76 | | | Total Hours* | 67 |
| | | | | *S&T advisor permission is required to transfer more than 69 credits toward the S&T Petroleum Engineering degree. | | |