

Metropolitan Community College — Missouri S&T

General Engineering

Transfer Guide Effective as of Fall 2024

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	Intro to the Profession	1	FR ENG 1100	Study and Careers in Engineering and Computing		1
ENGL 101	Composition and Reading I	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

<u>Metropolitan Community College</u>	<u>Semester</u>	<u>Missouri S&T</u>	
ENGR 113	Engineering Design & Microcomputer Applications	MECH ENG 1720	Intro to Engineering Design
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	HISTORY 1310 or	American History since 1877 or
POLS 136	Intro to U.S. National 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	SPMS 1185 or	Principles of Speech or
ENGL 215	Technical Writing	ENGLISH 3560	Technical Writing
CSIS 123 or	Programming Fundamentals or	CS 1971, 1981 or	Intro to Programming Method and Lab (C++) (3) or
ENGR 204	Programming for Engineers and Scientists	CS 1972, 1982	Intro to MATLAB Programming and Lab (3)
ENGR 233	Circuit Analysis I	EE 2800	Electrical Circuits
ENGR 229	Statics	CIV ENG 2200	Engineering Mechanics-Statics
ENGR 230	Dynamics	AERO ENG 2360	Dynamics
ENGR 223	Thermodynamics and Heat Transfer	MECH ENG 2519	Thermodynamics
ENGR 240	Mechanics of Materials	CIV ENG 2210	Mechanics of Materials
ENGR 215	Engineering Statistics and Computation	STAT 3115	Engineering Statistics
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 268 or	Women's Literature or	ENGLISH 2242 or	Literature by Women or
ENGL 260	African-American Literature or other literature	ENGLISH 2245 or	African American Literature or other literature
PHIL 203	Ethics or other engineering, business, bio, social ethics approved by advisor	PHILOS 1130	How Should I Live? An Intro to Ethics or other engineering, business, bio, social ethics approved by advisor
	<i>No free electives applied to the degree.</i>		Maximum Free Electives
	Group 2 Major Requirements		Group 2 Major Requirements
	Group 1 Core Requirements		Group 1 Core Requirements
	Total Hours		Total Hours*
	78		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

<u>Metropolitan Community College</u>	<u>Semester</u>	<u>Missouri S&T</u>	
ENGR 113	Engineering Design & Microcomputer Applications	MECH ENG 1720	Intro to Engineering Design
HIST 134*	Modern Western Civilization*	HISTORY 1200*	Modern Western Civilization*
(or HIST 120 or	(or United States History to 1865 or	(or HISTORY 1300 or	(or American History to 1877 or
HIST 121)	United States History since 1865)	HISTORY 1310)	American History since 1877)
	<small>*HIST 134 is preferred; 120 or 121 will also be accepted.</small>		<small>*HISTORY 1200 is preferred; 1300 or 1310 will also be accepted.</small>
ENGR 229	Statics	CIV ENG 2200	Engineering Mechanics-Statics
ENGR 230	Dynamics	MECH ENG 2350	Engineering Mechanics-Dynamics
ENGR 240	Mechanics of Materials	CIV ENG 2210	Mechanics of Materials
SRVY 135	Elementary Surveying	CIV ENG 2401	Fundamentals of Surveying
ENGR 215	Engineering Statistics and Computation	STAT 3115	Engineering Statistics
			<small>Will be substituted for STAT 3113.</small>
GEOL 101	Physical Geology	GEOLOGY 1110 (GEO ENG 1150)	Physical and Environmental Geology
Humanities or	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language	Humanities or	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language
Social Science or	or one communication course from this list: ENGL 102, ENGL 215, or COMM 100.	Social Science or	or one communication course from this list: ENGLISH 1160, 3560, or SPMS 1185.
Communication		Communication	
	<i>No free electives applied to the degree.</i>		Maximum Free Electives
	Group 2 Major Requirements		Group 2 Major Requirements
	Group 1 Core Requirements		Group 1 Core Requirements
	Total Hours		Total Hours*
	66		61

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

Biomedical Engineering-Biomanufacturing Group 2 Major Requirements

<u>Metropolitan Community College</u>		<u>Semester</u>	<u>Missouri S&T</u>		
COMM 100	Fundamentals of Speech	3	SP&MS 1185	Principles of Speech	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 Intro to U.S. National 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, 1510*	General Chemistry II (3) and Qualitative Analysis (2) <small>*CHEM 1510 is not an S&T degree requirement. Will transfer as general credit.</small>	3
CHEM 221	Organic Chemistry I	5	CHEM 2210, 2219	Organic Chemistry I and Lab	4
CHEM 222 or BIOL 101 or BIOL 204	Organic Chemistry II (5) or General Biology (5) or Genetics (3)	3	CHEM 2220, 2229 or BIO SCI 1113, 1219 or BIO SCI 2223	Organic Chemistry II and Lab or General Biology and Lab or General Genetics <small>Applies to degree as Track Elective.</small>	4
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* <small>*Will be substituted for CS 1500.</small>	3
ENGR 223	Thermodynamics and Heat Transfer	4	MECH ENG 2519*	Thermodynamics* <small>*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 biomedical engineering department. Students must complete both courses to receive credit.</small>	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
	<i>No free electives applied to the degree.</i>	0		Maximum Free Electives	0
	Group 2 Major Requirements	32		Group 2 Major Requirements	29
	Group 1 Core Requirements	40		Group 1 Core Requirements	35
	Total Hours	72		Total Hours*	64

*S&T advisor permission is required to transfer more than 68 credit hours toward the degree.

Biomedical Engineering-Biomaterials Group 2 Major Requirements

<u>Metropolitan Community College</u>		<u>Semester</u>	<u>Missouri S&T</u>		
COMM 100	Fundamentals of Speech	3	SP&MS 1185	Principles of Speech	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 Intro to U.S. National 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, 1510*	General Chemistry II (3) and Qualitative Analysis (2) <small>*CHEM 1510 is not an S&T degree requirement. Will transfer as general credit.</small>	3
CHEM 221	Organic Chemistry I	5	CHEM 2210, 2219*	Organic Chemistry I and Lab* <small>*CHEM 2219 Lab applies to the degree as a Track Elective (non-engineering).</small>	4
CHEM 222	Organic Chemistry II	5	CHEM 2220, 2229*	Organic Chemistry II and Lab* <small>CHEM 2229 Lab applies to the degree as a Track Elective (non-engineering).</small>	4
BIOL 101	General Biology	5	BIO SCI 1113*, 1219*	General General Biology* and Lab* <small>*Applies to degree as Track Elective (Non-engineering).</small>	4
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* <small>*Will be substituted for CS 1500.</small>	3
ENGR 229	Statics	3	CIV ENG 2200	Engineering Mechanics-Statics	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. Applies to the degree as a Track Elective (Engineering).	3
	<i>No free electives applied to the degree.</i>	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 65 credits toward the S&T Biomedical 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	Intro to Engineering Design	3
HIST 134 or HIST 120 or HIST 121 or POL S 136	Modern Western Civilization or United States History to 1865 or United States History since 1865 or Intro to U.S. National 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, 2219*	Organic Chemistry I and Lab* <small>Will satisfy the advanced chemistry elective requirement. *The lab is not an S&T degree requirement. Will transfer as general credit.</small>	4
CHEM 112	General College Chemistry II	5	CHEM 1320, 1510*	General Chemistry II (3) and Qualitative Analysis (2) <small>*CHEM 1510 is not an S&T degree requirement. Will transfer as general credit.</small>	3
ENGR 215	Engineering Statistics and Computation	3	STAT 3115	Engineering Statistics <small>or any statistics course 3000-level or higher. Satisfies statistics elective requirement.</small>	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 Principles of Speech or Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
	<i>No free electives applied to the degree.</i>	0		Maximum Free Electives	0
	Group 2 Major Requirements	34		Group 2 Major Requirements	31
	Group 1 Core Requirements	40		Group 1 Core Requirements	35
	Total Hours	74		Total Hours*	66

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

Chemical Engineering or 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		3
ENGL 215	Technical Writing	3	ENGLISH 3560	Technical Writing	3
COMM 100	Fundamentals of Speech	3	SP&MS 1185	Principles of Speech	3
HIST 134 or HIST 120 or HIST 121 or POL S 136	Modern Western Civilization or United States History to 1865 or United States History since 1865 or Intro to U.S. National 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, 1510*	General Chemistry II (3) and Qualitative Analysis (2) <small>*CHEM 1510 is not an S&T degree requirement. Will transfer as general credit.</small>	3
CHEM 221	Organic Chemistry I	5	CHEM 2210, 2219*	Organic Chemistry I and Lab* <small>*The lab will apply to the degree as 1 of the 9 science elective credits (below) .</small>	4
CHEM 222	Organic Chemistry II	5	CHEM 2220, 2229*	Organic Chemistry II (3) and Lab* (1) <small>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.</small>	4
BIOL 208	Microbiology	5	BIO SCI 3313, 3319	Microbiology and Lab (5) <small>Will satisfy 5 of 9 required hours of science electives .</small>	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* <small>*Will be substituted for CS 1500.</small>	3
ENGR 215	Engineering Statistics and Computation	3	STAT 3115	Engineering Statistics <small>Will be substituted for STAT 3113.</small>	3
ENGR 223	Thermodynamics and Heat Transfer	4	MECH ENG 2519*	Thermodynamics* <small>*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.</small>	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
	<i>No free electives applied to the degree.</i>	0		Maximum Free Electives	0
	Group 2 Major Requirements	45		Group 2 Major Requirements	40
	Group 1 Core Requirements	40		Group 1 Core Requirements	35
	Total Hours	85		Total Hours*	75

*S&T advisor permission is required to transfer more than 68 credits toward the S&T Chemical 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	Intro to Engineering Design	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
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 Intro to U.S. National 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
ENGR 215	Engineering Statistics and Computation	3	STAT 3115	Engineering Statistics <small>Will be substituted for STAT 3113.</small>	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
	<i>No free electives applied to the degree.</i>	0		Maximum Free Electives	0
	Group 2 Major Requirements	32		Group 2 Major Requirements	29
	Group 1 Core Requirements	40		Group 1 Core Requirements	35
	Total Hours	72		Total Hours*	64

*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	Principles of Speech	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 Western Civilization or United States History to 1865 or United States History since 1865 or Intro to U.S. National 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 121* and MATH 122*	Discrete Structures for Computer Science I* and Discrete Structures for Computer Science II* <small>*The combination of MCC MATH 121 AND 122 is equivalent to Missouri S&T CS 1200. Both courses must be taken to receive credit for Missouri S&T CS 1200.</small>	6	CS 1200*	Discrete Mathematics for Computer Science* <small>*The combination of MCC MATH 121 AND 122 is equivalent to Missouri S&T CS 1200. Both courses must be taken to receive credit for Missouri S&T CS 1200.</small>	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
ENGR 215	Engineering Statistics and Computation	3	STAT 3115	Engineering Statistics <small>Will be substituted for STAT 3117.</small>	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
Electives	Maximum Free Electives	3	Electives	Maximum Free Electives	3
	Group 2 Major Requirements	34		Group 2 Major Requirements	30
	Group 1 Core Requirements	40		Group 1 Core Requirements	35
	Total Hours	74		Total Hours*	65

*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	Intro to Engineering Design	3
COMM 100	Fundamentals of Speech	3	SPMS 1185	Principles of Speech	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 Western Civilization or United States History to 1865 or United States History since 1865 or Intro to U.S. National 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 223 or CSIS 271	Object-Oriented Programming with C++ or Data Structures and Algorithm Analysis	3	CS 1500	Computational Problem Solving	3
ENGR 229 and ENGR 230 <small>(BOTH of the courses above or ONE of the courses below.)</small>	Statics (3) and Dynamics (3) <small>(Both courses above combined or any one of the following courses will satisfy a required engineering science elective.)</small>	4	CIV ENG 2200 and MECH ENG 2350 <small>(BOTH of the courses above or ONE of the courses below.)</small>	Engineering Mechanics-Statics (3) and Engineering Mechanics-Dynamics (3) <small>(Both courses above combined or any one of the following courses will satisfy a required engineering science elective.)</small>	3
OR ENGR 223 or CHEM 221 or BIOL 214	OR Thermodynamics and Heat Transfer (4) or Organic Chemistry I (5) or Principles of Genetics (4)	4	OR MECH ENG 2519 or CHEM 2210 or BIO SCI 2223	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
ENGR 215	Engineering Statistics and Computation	3	STAT 3115	Engineering Statistics <small>Will be substituted for STAT 3117.</small>	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
Electives	Maximum Free Electives	3	Electives	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.

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	Intro to Engineering Design	3
PSYC 140	General Psychology	3	PSYCH 1101	General Psychology	3
HIST 134 or HIST 120 or HIST 121 or	Modern Western Civilization or United States History to 1865 or United States History since 1865 or	3	HISTORY 1200 or HISTORY 1300 or HISTORY 1310 or	Modern Western Civilization or American History to 1877 or American History since 1877 or	3
POLS 136	Intro to U.S. National Politics		POL SCI 1200	American Government	
COMM 100	Fundamentals of Speech	3	SPMS 1185	Principles of Speech	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
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	Electrical Circuits	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
ENGR 215	Engineering Statistics and Computation	3	STAT 3115	Engineering Statistics	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
	<i>No free electives applied to the degree.</i>	3	Electives	Maximum Free Electives	0
	Group 2 Major Requirements	44		Group 2 Major Requirements	38
	Group 1 Core Requirements	40		Group 1 Core Requirements	35
	Total Hours	84		Total Hours*	61

*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	Intro to Engineering Design	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
HIST 134 or HIST 120 or HIST 121	Modern Western Civilization or United States History to 1865 or United States History since 1865	3	HISTORY 1200 or HISTORY 1300 or HISTORY 1310	Modern Western Civilization or American History to 1877 or American History since 1877	3
GEO 101	Physical Geology	5	GEOLOGY 1110 (GEO ENG 1150)	Physical and Environmental Geology	3
CHEM 112	General College Chemistry II	5	CHEM 1320, 1510*	General Chemistry II (3) and Qualitative Analysis (2) <small>*CHEM 1510 is not an S&T degree requirement. Will transfer as general credit.</small>	3
BIOL 101	General Biology	5	BIO SCI 1113, 1219*	General Biology and Lab* <small>*The lab is not an S&T degree requirement, transfers as general elective credit.</small>	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 215	Engineering Statistics and Computation	3	STAT 3115	Engineering Statistics <small>Will be substituted for STAT 3113.</small>	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
	<i>No free electives applied to the degree.</i>	0		Maximum Free Electives	0
	Group 2 Major Requirements	39		Group 2 Major Requirements	32
	Group 1 Core Requirements	40		Group 1 Core Requirements	35
	Total Hours	79		Total Hours*	67

*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	Intro to Engineering Design	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 Intro to U.S. National 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 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
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
ENGR 215	Engineering Statistics and Computation	3	STAT 3115	Engineering Statistics	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
	<i>No free electives applied to the degree.</i>	0		Maximum Free Electives	0
	Group 2 Major Requirements	35		Group 2 Major Requirements	32
	Group 1 Core Requirements	40		Group 1 Core Requirements	35
	Total Hours	75		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 Applications	3	MECH ENG 1720	Intro to Engineering Design	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 Intro to U.S. National 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	Electrical Circuits	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
ENGR 215	Engineering Statistics and Computation	3	STAT 3115	Engineering Statistics	3
ENGL 220 or ENGL 222 or ENGL 254 or ENGL 268 or ENGL 260	British Literature to 1750 or American Literature I or World Literature I or Women's Literature or African-American Literature or other literature	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 or other literature	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	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 Applications	3	MECH ENG 1720	Intro to Engineering Design	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
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 Intro to U.S. National 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 215	Engineering Statistics and Computation	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, 1510*	General Chemistry II (3) and Qualitative Analysis (2) <small>*CHEM 1510 is not an S&T degree requirement. Will transfer as general credit.</small>	3
CHEM 221 or ENGR 233	Organic Chemistry 1 or Circuit Analysis I	4	CHEM 2210, 2219* or EE 2800	Organic Chemistry I and Lab* or Electrical Circuits <small>Not specifically required for the degree but will satisfy out-of-department technical elective requirement. **The lab is not an S&T degree requirement, transfers as general elective credit.</small>	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
Electives	Maximum Free Electives	5	Electives	Maximum Free Electives	3
	Group 2 Major Requirements	38		Group 2 Major Requirements	33
	Group 1 Core Requirements	40		Group 1 Core Requirements	35
	Total Hours	78		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 Applications	3	MECH ENG 1720	Intro to Engineering Design	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 Western Civilization or United States History to 1865 or United States History since 1865 or Intro to U.S. National 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 215	Engineering Statistics and Computation	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 or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	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 Applications	3	MECH ENG 1720	Intro to Engineering Design	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
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 Intro to U.S. National 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
ENGR 215	Engineering Statistics and Computation	3	STAT 3115	Engineering Statistics	3
ENGR 233	Circuit Analysis I	4	EE 2800	Electrical Circuits	3
ENGR 223	Thermodynamics and Heat Transfer	4	MECH ENG 2519	Thermodynamics	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
Electives	Maximum Free Electives	6	Electives	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 Applications	3	MECH ENG 1720	Intro to Engineering Design	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 Western Civilization or United States History to 1865 or United States History since 1865 or Intro to U.S. National 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 MATLAB Programming and Lab	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 or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3
Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	3	Humanities or Social Science	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language.	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.