

Johnson County 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>Johnson County Community College</u>			<u>Semester</u>	<u>Missouri S&T</u>			
MATH 241 and	Calculus I and	10		MATH 1214 and	Calculus I and	8	
MATH 242	Calculus II			MATH 1215	Calculus II Grade of C or better is required.		
MATH 243	Calculus III	5		MATH 2222	Calculus III Grade of C or better is required.	4	
MATH 254	Differential Equations	4		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 124, 125	General Chemistry I and Lab	5		CHEM 1310, 1319	General Chemistry I and Lab	5	
ENGR 121	Engineering Orientation	2		FR ENG 1100	Study and Careers in Engineering and Computing	1	
ENGL 121	Composition I	3		ENGLISH 1120	Exposition and Argumentation	3	
ECON 231 or	Principles of Microeconomics or	3		ECON 1100 or	Principles of Microeconomics or	3	
ECON 230	Principles of Macroeconomics			ECON 1200	Principles of Macroeconomics		
Total Hours			42	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

Aerospace Engineering Group 2 Major Requirements					
	<u>Johnson County Community College</u>	<u>Semester</u>		<u>Missouri S&T</u>	
HIST 126 or HIST 140 or HIST 141 or POLS 124	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 or American National Government	3		HISTORY 1200 or HISTORY 1300 or HISTORY 1310 or POL SCI 1200	3
ENGL 122 or COMS 121 or ENGL 123	Composition II or Public Speaking or Technical Writing I	3		ENGLISH 1160 or SPMS 1185 or ENGLISH 3560	3
CS 200 or CS 250	Concepts of Programming Algorithms Using C++ or Basic Data Structures using C++	4		CS 1971, 1981	3
ENGR 251	Statics	3		CIV ENG 2200	3
MATH 246	Elementary Linear Algebra	3		MATH 3108	3
ENGL 236 or ENGL 246 or ENGL 251 or ENGL 217	British Literature to 1800 or American Literature I or World Literature to 1620 or Literature by Women or other literature	3		ENGLISH 1211 or ENGLISH 1221 or ENGLISH 1231 or ENGLISH 2242	3
PHIL 143	Ethics or other engineering, business, bio, social ethics approved by advisor	3		PHILOS 1130	3
	<i>No free electives applied to the degree.</i>	0		Maximum Free Electives	0
	Group 2 Major Requirements	22		Group 2 Major Requirements	21
	Group 1 Core Requirements	42		Group 1 Core Requirements	35
	Total Hours	64		Total Hours*	56

*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

Architectural Engineering Group 2 Major Requirements					
	<u>Johnson County Community College</u>	<u>Semester</u>		<u>Missouri S&T</u>	
HIST 126* (or HIST 140 or HIST 141)	Western Civ: Scientific Revolution to Modern Age* (or US History to 1877 or US History since 1877) <small>*HIST 126 is preferred; 140 or 141 will also be accepted.</small>	3		HISTORY 1200* (or HISTORY 1300 or HISTORY 1310)	3
ENGR 251	Statics	3		CIV ENG 2200	3
ENGR 254	Dynamics	3		MECH ENG 2350	2
GEOS 130	General Geology	5		GEOLOGY 1110 (GEO ENG 1150)	3
Humanities or Social Science or Communication	Any history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language or one communication course from this list: ENGL 122, 123 or COMS 121.	3		Humanities or Social Science or Communication	3
	<i>No free electives applied to the degree.</i>	0		Maximum Free Electives	0
	Group 2 Major Requirements	17		Group 2 Major Requirements	14
	Group 1 Core Requirements	42		Group 1 Core Requirements	35
	Total Hours	59		Total Hours*	49

*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>Johnson County Community College</u>		<u>Semester</u>	<u>Missouri S&T</u>		
COMS 121	Public Speaking	3	SP&MS 1185	Principles of Speech	3
ENGL 123	Technical Writing I	3	ENGLISH 3560	Technical Writing	3
HIST 126 or HIST 140 or HIST 141 or POLS 124	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 or American National Government	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 131	General Chemistry II	4	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 220	Organic Chemistry I	5	CHEM 2210, 2219	Organic Chemistry I and Lab	4
CHEM 221 or BIOL 121 or BIOL 205	Organic Chemistry II (5) or Introductory Biology for Nonmajors (4) or General Genetics (4)	4	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
BIOL 135	Principles of Cell and Molecular Biology	4	BIO SCI 2213, 2219	Cell Biology and Lab	4
BIOL 144	Human Anatomy and Physiology	5	BIO SCI 3333, 3339	Anatomy and Physiology I and Lab	4
CS 235 or CS 250 or CS 200*	Object-Oriented Programming Using C++ or Basic Data Structures using C++ or Concepts of Programming Algorithms Using C++*	4	CS 1500 or CS 1971,1981*	Computational Problem Solving or Intro to Programming Methodology and Lab* C++ <small>*Will be substituted for CS 1500.</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	35		Group 2 Major Requirements	34
	Group 1 Core Requirements	42		Group 1 Core Requirements	35
	Total Hours	77		Total Hours*	69

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

Biomedical Engineering-Biomaterials Group 2 Major Requirements

<u>Johnson County Community College</u>		<u>Semester</u>	<u>Missouri S&T</u>		
COMS 121	Public Speaking	3	SP&MS 1185	Principles of Speech	3
ENGL 123	Technical Writing I	3	ENGLISH 3560	Technical Writing	3
HIST 126 or HIST 140 or HIST 141 or POLS 124	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 or American National Government	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 131	General Chemistry II	4	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 220	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 221	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 121	Introductory Biology for Nonmajors	4	BIO SCI 1113*, 1219*	General General Biology* and Lab* <small>*Applies to degree as Track Elective (Non-engineering).</small>	4
BIOL 135	Principles of Cell and Molecular Biology	4	BIO SCI 2213, 2219	Cell Biology and Lab	4
BIOL 144	Human Anatomy and Physiology	5	BIO SCI 3333, 3339	Human Anatomy and Physiology I and Lab	4
CS 235 or CS 250 or CS 200*	Object-Oriented Programming Using C++ or Basic Data Structures using C++ or Concepts of Programming Algorithms Using C++*	4	CS 1500 or CS 1971,1981*	Computational Problem Solving or Intro to Programming Methodology and Lab* C++ <small>*Will be substituted for CS 1500.</small>	3
ENGR 251	Statics	3	CIV ENG 2200	Engineering Mechanics-Statics	3
	<i>No free electives applied to the degree.</i>	0		Maximum Free Electives	0
	Group 2 Major Requirements	43		Group 2 Major Requirements	38
	Group 1 Core Requirements	42		Group 1 Core Requirements	35
	Total Hours	85		Total Hours*	73

*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

Johnson County Community College		Semester	Missouri S&T	
HIST 126 or HIST 140 or HIST 141 or POLS 124	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 or American National Government	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
ENGR 251	Statics	3	CIV ENG 2200	Engineering Mechanics-Statics
CHEM 220	Organic Chemistry I	5	CHEM 2210	Organic Chemistry I (3) <i>Will satisfy the advanced chemistry elective requirement.</i>
CHEM 131	General Chemistry II	4	CHEM 1320, 1510*	General Chemistry II (3) and Qualitative Analysis (2) <i>*CHEM 1510 is not an S&T degree requirement. Will transfer as general credit.</i>
ENGL 122 or COMS 121 or HSS Elective	Composition II or Public Speaking 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.
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.
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.
	<i>No free electives applied to the degree.</i>	0		Maximum Free Electives
	Group 2 Major Requirements	24		Group 2 Major Requirements
	Group 1 Core Requirements	42		Group 1 Core Requirements
	Total Hours	66		Total Hours*
				56

*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

Johnson County Community College		Semester	Missouri S&T	
COMS 121	Public Speaking	3	SP&MS 1185	Principles of Speech
ENGL 123	Technical Writing I	3	ENGLISH 3560	Technical Writing
HIST 126 or HIST 140 or HIST 141 or POLS 124	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 or American National Government	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
CHEM 131	General Chemistry II	4	CHEM 1320, 1510*	General Chemistry II (3) and Qualitative Analysis (2) <i>*CHEM 1510 is not an S&T degree requirement. Will transfer as general credit.</i>
CHEM 220	Organic Chemistry I	5	CHEM 2210, 2219*	Organic Chemistry I and Lab* <i>*The lab will apply to the degree as 1 of the 9 science elective credits (below) .</i>
CHEM 221 or BIOL 135 or BIOL 230,231	Organic Chemistry II (5) or Principles of Cell and Molecular Biology (4) or Microbiology and Lab (5) <i>Will satisfy science elective requirement. Select up to 8 hours from these options.</i>	9	CHEM 2220, 2219 or BIO SCI 2213, 2219 or BIO SCI 3313, 3319	Organic Chemistry II and Lab (4 hours) or Cell Biology and Lab (4 hours) or Microbiology and Lab (5 hours) <i>Will satisfy science elective requirement. Select up to 8 hours from these options.</i>
CS 235 or CS 250 or CS 200*	Object-Oriented Programming Using C++ or Basic Data Structures using C++ or Concepts of Programming Algorithms Using C++*	4	CS 1500 or CS 1971,1981*	Computational Problem Solving or Intro to Programming Methodology and Lab* C++ <i>*Will be substituted for CS 1500.</i>
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.
	<i>No free electives applied to the degree.</i>	0		Maximum Free Electives
	Group 2 Major Requirements	34		Group 2 Major Requirements
	Group 1 Core Requirements	42		Group 1 Core Requirements
	Total Hours	76		Total Hours*
				65

*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>Johnson County Community College</u>		<u>Semester</u>	<u>Missouri S&T</u>		
ENGL 122 or COMS 121 or ENGL 123	Composition II or Public Speaking or Technical Writing I	3	ENGLISH 1160 or SPMS 1185 or ENGLISH 3560	Writing and Research or Principles of Speech or Technical Writing	3
HIST 126 or HIST 140 or HIST 141 or POLS 124	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 or American National Government	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
GEOS 130	General Geology	5	GEOLOGY 1110 (GEO ENG 1150)	Physical and Environmental Geology	3
ENGR 251	Statics	3	CIV ENG 2200	Engineering Mechanics-Statics	3
ENGR 254	Dynamics	3	MECH ENG 2350	Engineering Mechanics-Dynamics	2
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	20		Group 2 Major Requirements	17
	Group 1 Core Requirements	42		Group 1 Core Requirements	35
	Total Hours	62		Total Hours*	52

*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

Johnson County Community College		Semester	Missouri S&T		
COMS 121	Public Speaking	3	SPMS 1185	Principles of Speech	3
ENGL 122 or ENGL 123	Composition II or Technical Writing I	3	ENGLISH 1160 or ENGLISH 3560	Writing and Research or Technical Writing	3
HIST 126 or HIST 140 or HIST 141 or	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 or	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
POLS 124	American National Government				
CS 210 or CS 211	Discrete Structures I or Discrete Structures II	3	CS 1200	Discrete Math for Computer Science	3
CS 235 or CS 250	Object-Oriented Programming Using C++ or Basic Data Structures using C++	4	CS 1500	Computational Problem Solving	3
ENGR 251 or ENGR 254 or CHEM 220 or BIOL 135 or BIOL 205	Statics (3) or Dynamics (3) or Organic Chemistry I (4) or Principles of Cell and Molecular Biology (4) or General Genetics (4)	3	CIV ENG 2200 or MECH ENG 2350 or CHEM 2210 or BIO SCI 2213 or BIO SCI 2223	Engineering Mechanics-Statics (3) or Engineering Mechanics-Dynamics (2) or Organic Chemistry I (4) or Cell Biology (3) or General Genetics (3) <small>Satisfies a required engineering/science elective.</small>	3
MATH 246	Elementary Linear Algebra	3	MATH 3108	Linear Algebra <small>Will satisfy a required math elective.</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	28		Group 2 Major Requirements	27
	Group 1 Core Requirements	42		Group 1 Core Requirements	35
	Total Hours	70		Total Hours*	62

*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

Johnson County Community College		Semester	Missouri S&T		
COMS 121	Public Speaking	3	SPMS 1185	Principles of Speech	3
ENGL 122 or ENGL 123	Composition II or Technical Writing I	3	ENGLISH 1160 or ENGLISH 3560	Writing and Research or Technical Writing	3
HIST 126 or HIST 140 or HIST 141 or	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 or	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
POLS 124	American National Government				
CS 235 or CS 250	Object-Oriented Programming Using C++ or Basic Data Structures using C++	4	CS 1500	Computational Problem Solving	3
ENGR 251 and ENGR 254 <small>(BOTH of the courses above or ONE of the courses below.)</small> OR	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> OR	4	CIV ENG 2200 and MECH ENG 2350 <small>(BOTH of the courses above or ONE of the courses below.)</small> OR	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> OR	3
CHEM 220 or BIOL 135 or BIOL 205	Organic Chemistry I (4) or Principles of Cell and Molecular Biology (4) or General Genetics (4)	4	CHEM 2210, 2219* or BIO SCI 2213 or BIO SCI 2223	Organic Chemistry I (4) and Lab* (1) or Cell Biology (3) or Genetics (3) <small>*CHEM 2219 is not an S&T degree requirement; will transfer as elective credit.</small>	35 General
MATH 246	Elementary Linear Algebra	3	MATH 3108	Linear Algebra	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	26		Group 2 Major Requirements	24
	Group 1 Core Requirements	42		Group 1 Core Requirements	35
	Total Hours	68		Total Hours*	59

*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>Johnson County Community College</u>		<u>Semester</u>	<u>Missouri S&T</u>		
PSYC 130	Intro to Psychology	3	PSYCH 1101	General Psychology	3
HIST 126 or HIST 140 or HIST 141 or	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 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 124	American National Government		POL SCI 1200	American Government	
COMS 121	Public Speaking	3	SPMS 1185	Principles of Speech	3
ENGL 122 or	Composition II or	3	ENGLISH 1160 or	Writing and Research or	3
ENGL 123	Technical Writing I		ENGLISH 3560	Technical Writing	
CS 200 or CS 250	Concepts of Programming Algorithms Using C++ or Basic Data Structures using C++	4	CS 1971, 1981	Intro to Programming Method and Lab (C++)	3
ENGR 251	Statics	3	CIV ENG 2200	Engineering Mechanics-Statics	3
ENGR 254	Dynamics	3	MECH ENG 2350	Engineering Mechanics-Dynamics	2
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	28		Group 2 Major Requirements	23
	Group 1 Core Requirements	42		Group 1 Core Requirements	35
	Total Hours	70		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>Johnson County Community College</u>		<u>Semester</u>	<u>Missouri S&T</u>		
ENGL 122 or COMS 121 or ENGL 123	Composition II or Public Speaking or Technical Writing I	3	ENGLISH 1160 or SPMS 1185 or ENGLISH 3560	Writing and Research or Principles of Speech or Technical Writing	3
HIST 126 or HIST 140 or HIST 141	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877	3	HISTORY 1200 or HISTORY 1300 or HISTORY 1310	Modern Western Civilization or American History to 1877 or American History since 1877	3
GEOS 130	General Geology	5	GEOLOGY 1110 (GEO ENG 1150)	Physical and Environmental Geology	3
CHEM 131	General Chemistry II	4	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 121	Introductory Biology for Non-Majors	4	BIO SCI 1113, 1219*	General Biology and Lab* <small>*BIO SCI 1219 is not an S&T degree requirement, will transfer as general elective credit.</small>	3
ENGR 251	Statics	3	CIV ENG 2200	Engineering Mechanics-Statics	3
ENGR 254	Dynamics	3	MECH ENG 2350	Engineering Mechanics-Dynamics	2
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	28		Group 2 Major Requirements	23
	Group 1 Core Requirements	42		Group 1 Core Requirements	35
	Total Hours	70		Total Hours*	58

*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>Johnson County Community College</u>		<u>Semester</u>	<u>Missouri S&T</u>		
ENGL 123	Technical Writing I	3	ENGLISH 3560	Technical Writing	3
HIST 126 or HIST 140 or HIST 141 or	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 or	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
POLS 124	American National Government				
CS 235 or CS 250 or CS 200*	Object-Oriented Programming Using C++ or Basic Data Structures using C++ or Concepts of Programming Algorithms Using C++*	4	CS 1500 or CS 1971,1981	Computational Problem Solving or Intro to Programming Methodology and Lab C++)	3
GEOS 130	General Geology	5	GEO ENG 1150 (GEOLOGY 1110)	Physical and Environmental Geology	3
ENGR 251	Statics	3	CIV ENG 2200	Engineering Mechanics-Statics	3
ENGR 254	Dynamics	3	MECH ENG 2350	Engineering Mechanics-Dynamics	2
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	27		Group 2 Major Requirements	23
	Group 1 Core Requirements	42		Group 1 Core Requirements	35
	Total Hours	69		Total Hours*	58

*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>Johnson County Community College</u>		<u>Semester</u>	<u>Missouri S&T</u>		
HIST 126 or HIST 140 or HIST 141 or	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 or	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
POLS 124	American National Government				
ENGL 122 or COMS 121 or ENGL 123	Composition II or Public Speaking or Technical Writing I	3	ENGLISH 1160 or SPMS 1185 or ENGLISH 3560	Writing and Research or Principles of Speech or Technical Writing	3
CS 200 or CS 250	Concepts of Programming Algorithms Using C++ or Basic Data Structures using C++	4	CS 1971, 1981	Intro to Programming Method and Lab (C++)	3
ENGR 251	Statics	3	CIV ENG 2200	Engineering Mechanics-Statics	3
MATH 246	Elementary Linear Algebra	3	MATH 3108	Linear Algebra I <small>Will satisfy the Advanced Math/Statistics elective requirement.</small>	3
ENGL 236 or ENGL 246 or ENGL 251 or ENGL 217	British Literature to 1800 or American Literature I or World Literature to 1620 or Literature by Women or other literature	3	ENGLISH 1211 or ENGLISH 1221 or ENGLISH 1231 or ENGLISH 2242	British Literature I: The Beginnings to 1800 or American Literature: 1600 to 1865 or World Literature I or Literature by Women 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	22		Group 2 Major Requirements	21
	Group 1 Core Requirements	42		Group 1 Core Requirements	35
	Total Hours	64		Total Hours*	56

*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>Johnson County Community College</u>		<u>Semester</u>	<u>Missouri S&T</u>	
ENGL 122 or COMS 121 or ENGL 123	Composition II or Public Speaking or Technical Writing I	3	ENGLISH 1160 or SPMS 1185 or ENGLISH 3560	Writing and Research or Principles of Speech or Technical Writing 3
HIST 126 or HIST 140 or HIST 141 or POLS 124	Western Civ: Scientific Rev to Modern Age or US History to 1877 or US History since 1877 or American National Government	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 251	Statics	3	CIV ENG 2200	Engineering Mechanics-Statics 3
CHEM 131	General Chemistry II	4	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 220	Organic Chemistry I	5	CHEM 2210, 2219*	Organic Chemistry I (4) and Lab* (1) <small>CHEM 22100 is not specifically required for the degree but will satisfy Out-of-Department Technical Elective Requirement. *CHEM 2219 is not an S&T requirement; will transfer as elective credit.</small> 4
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 Group 2 Major Requirements Group 1 Core Requirements	5 29 42	Electives	Maximum Free Electives Group 2 Major Requirements Group 1 Core Requirements 3 25 35
Total Hours		71	Total Hours*	
			60	

*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>Johnson County Community College</u>		<u>Semester</u>	<u>Missouri S&T</u>	
ENGL 122 or COMS 121	Composition II or Public Speaking	3	ENGLISH 1160 or ENGLISH 3560	Writing and Research or Technical Writing 3
HIST 126 or HIST 140 or HIST 141 or POLS 124	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 or American National Government	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 251	Statics	3	CIV ENG 2200	Engineering Mechanics-Statics 3
ENGR 254	Dynamics	3	MECH ENG 2350	Engineering Mechanics-Dynamics 2
GEOS 130	General 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	23		Group 2 Major Requirements 20
	Group 1 Core Requirements	42		Group 1 Core Requirements 35
Total Hours		65	Total Hours*	
			55	

*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>Johnson County Community College</u>		<u>Semester</u>	<u>Missouri S&T</u>		
ENGL 122 or COMS 121 or ENGL 123	Composition II or Public Speaking or Technical Writing I	3	ENGLISH 1160 or SPMS 1185 or ENGLISH 3560	Writing and Research or Principles of Speech or Technical Writing	3
HIST 126 or HIST 140 or HIST 141 or POLS 124	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 or American National Government	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
CS 200 or CS 250	Concepts of Programming Algorithms Using C++ or Basic Data Structures using C++	4	CS 1971, 1981	Intro to Programming Method and Lab (C++)	3
MATH 246	Elementary Linear Algebra	3	MATH 3108	Linear Algebra	3
ENGR 251	Statics	3	CIV ENG 2200	Engineering Mechanics-Statics	3
MATH 285	Statistics for Business	4	STAT 3111	Statistical Tools for Decision Making	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	32		Group 2 Major Requirements	30
	Group 1 Core Requirements	42		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 Nuclear Engineering degree.

Petroleum Engineering Group 2 Major Requirements

<u>Johnson County Community College</u>		<u>Semester</u>	<u>Missouri S&T</u>		
ENGL 122 or COMS 121	Composition II or Public Speaking	3	ENGLISH 1160 or ENGLISH 3560	Writing and Research or Technical Writing	3
HIST 126 or HIST 140 or HIST 141 or POLS 124	Western Civ: Scientific Revolution to Modern Age or US History to 1877 or US History since 1877 or American National Government	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
GEOS 130	General Geology	5	GEOLOGY 1110 (GEO ENG 1150)	Physical and Environmental Geology	3
ENGR 251	Statics	3	CIV ENG 2200	Engineering Mechanics-Statics	3
ENGR 254	Dynamics	3	MECH ENG 2350	Engineering Mechanics-Dynamics	2
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	23		Group 2 Major Requirements	20
	Group 1 Core Requirements	42		Group 1 Core Requirements	35
	Total Hours	65		Total Hours*	55

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