

William Jewell College — Missouri S&T

General Engineering Transfer Guide

Effective as of Fall 2017

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>William Jewell College</u>	<u>Semester</u>		<u>Missouri S&T</u>	
CTI 109 and MAT 200	Calculus I and Calculus II* <small>*Both CTI 109 and MAT 200 must be taken to receive credit for MATH 1214 and 1215.</small>	8	MATH 1214, 1215	Calculus for Engineers I & II <small>Grade of C or better is required.</small>	4
MAT 201	Calculus III	4	MATH 2222	Calculus with Analytic Geometry III <small>Grade of C or better is required.</small>	4
MAT 202	Differential Equations	4	MATH 3304	Elementary Differential Equations	3
PH 213	General Physics I and Lab	5	PHYSICS 1135	Engineering Physics I <small>Grade of C or better is required.</small>	4
PH 214	General Physics II and Lab	5	PHYSICS 2135	Engineering Physics II <small>Grade of C or better is required.</small>	4
CHE 121	General Chemistry I and Lab	4	CHEM 1310, 1319	General Chemistry I and Lab	5
CTI 102 or CTI 120	Written Communication or Advanced Written Communication	4	ENGLISH 1120	Exposition and Argumentation	3
ECO 201 or ECO 202	Principles of Microeconomics or Principles of Macroeconomics	3	ECON 1100 or ECON 1200	Principles of Microeconomics or Principles of Macroeconomics	3
Total Hours		37			Total Hours 30

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 history, economics, political science, sociology, psychology, philosophy, fine art, literature, or foreign language. Missouri S&T approved HSS courses are listed at ugs.mst.edu. Your campus may have additional acceptable options. Consult with your advisor or email transfer@mst.edu with questions.

Aerospace Engineering Group 2 Major Requirements

	<u>Partner School</u>	<u>Semester</u>		<u>Missouri S&T</u>	
HIS 121 or	The American Context to 1865 or			HISTORY 1300 or	American History to 1877 or
HIS 122 or	The American Context, 1865 to Present or	3		HISTORY 1310 or	American History since 1877 or
POL 102	American National Government			POL SCI 1200	American Government
GEN 102 or	Written Communication or			ENGLISH 1160 or	Writing and Research or
COM 100	Fundamentals of Speech and Communication	3		SPMS 1185	Principles of Speech
MAT 281	Applied Linear Algebra	3		MATH 3108	Linear Algebra I (Will satisfy the Advanced Math/Comp Sci elective requirement.)
	<i>See your advisor for course options.</i>			Literature Elective	3
	<i>See your advisor for course options.</i>			Ethics Elective	3
	<i>No free electives applied to the degree.</i>			Maximum Free Electives	0
	Group 2 Major Requirements	9		Group 2 Major Requirements	15
	Group 1 Core Requirements	37		Group 1 Core Requirements	30
	Total Hours	46		Total Hours*	45

*S&T advisor permission is required to transfer more than 66 credits toward the S&T Aerospace Engineering degree.

Architectural Engineering Group 2 Major Requirements

	<u>Partner School</u>	<u>Semester</u>		<u>Missouri S&T</u>	
HIS 121 or	The American Context to 1865 or			HISTORY 1300 or	American History to 1877 or
HIS 122	The American Context, 1865 to Present	3		HISTORY 1310	American History since 1877
PHY 332	Analytical Mechanics (Statics)	3		CIV ENG 2200	Engineering Mechanics-Statics
				ENGLISH 1160 or	Writing and Research or
GEN 102 or	Written Communication or			SPMS 1185 or	Public Speaking or
COM 100	Fundamentals of Speech and Communication	3		HSS Elective	Humanities/Social Science Elective: history, economics, political science, sociology, psychology, philosophy, fine art, literature, foreign language
				PHYSICS 2305	Intro to Modern Physics (or other chemistry, geology, biology, physics, or astronomy course that is not otherwise required for the degree)
PHY 316	Modern Physics	4			Applies to
	<i>No free electives applied to the degree.</i>			Maximum Free Electives	0
	Group 2 Major Requirements	13		Group 2 Major Requirements	12
	Group 1 Core Requirements	37		Group 1 Core Requirements	30
	Total Hours	50		Total Hours*	42

*S&T advisor permission is required to transfer more than 66 credits toward the S&T Architectural Engineering degree.

Ceramic Engineering Group 2 Major Requirements

<u>Partner School</u>		<u>Semester</u>	<u>Missouri S&T</u>		
HIS 121 or HIS 122 or POL 102	The American Context to 1865 or The American Context, 1865 to Present or American National Government	3	HISTORY 1300 or HISTORY 1310 or POL SCI 1200	American History to 1877 or American History since 1877 or American Government	3
PHY 332	Analytical Mechanics (Statics)	3	CIV ENG 2200	Engineering Mechanics-Statics	3
CHE 301	Organic Chemistry I	4	CHEM 2210/2219	Organic Chemistry I and Lab <small>(Not a specific requirement. Will satisfy technical elective requirement.)</small>	5
CHE 122	General Chemistry II and Lab	5	CHEM 1320	General Chemistry II	3
GEN 102 or COM 100	Written Communication or Fundamentals of Speech and Communication	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 Humanities/Social Science Elective	3
<i>See your advisor for course options.</i>					
<i>No free electives applied to the degree.</i>					
		18			20
		37			30
Total Hours		55			50

*S&T advisor permission is required to transfer more than 65 credits toward the S&T Ceramic Engineering degree.

Chemical Engineering Group 2 Major Requirements

<u>Partner School</u>		<u>Semester</u>	<u>Missouri S&T</u>		
GEN 102	Written Communication	3	ENGLISH 1160	Writing and Research	3
HIS 121 or HIS 122 or POL 102	The American Context to 1865 or The American Context, 1865 to Present or American National Government	3	HISTORY 1300 or HISTORY 1310 or POL SCI 1200	American History to 1877 or American History since 1877 or American Government	3
CHE 122	General Chemistry II and Lab	5	CHEM 1320	General Chemistry II	5
CHE 301	Organic Chemistry I	4	CHEM 2210	Organic Chemistry I	3
CHE 302	Organic Chemistry II	4	CHEM 2220	Organic Chemistry II <small>(Will satisfy science elective requirement.)</small>	3
<i>See your advisor for course options.</i>					
<i>See your advisor for course options.</i>					
<i>No free electives applied to the degree.</i>					
		19			23
		37			30
Total Hours		56			53

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

Chemical Engineering - Biochemical Engineering Emphasis Group 2 Major Requirements

<u>Partner School</u>		<u>Semester</u>	<u>Missouri S&T</u>		
GEN 102	Written Communication	3	ENGLISH 1160	Writing and Research	3
HIS 121 or HIS 122 or POL 102	The American Context to 1865 or The American Context, 1865 to Present or American National Government	3	HISTORY 1300 or HISTORY 1310 or POL SCI 1200	American History to 1877 or American History since 1877 or American Government	3
CHE 122	General Chemistry II and Lab	5	CHEM 1320	General Chemistry II	5
CHE 301	Organic Chemistry I	4	CHEM 2210	Organic Chemistry I	3
CHE 302	Organic Chemistry II	4	CHEM 2220	Organic Chemistry II <small>(Will satisfy science elective requirement.)</small>	3
<i>See your advisor for course options.</i>					
<i>See your advisor for course options.</i>					
<i>No free electives applied to the degree.</i>					
		19			23
		37			30
Total Hours		56			53

*S&T advisor permission is required to transfer more than 71 credits toward the S&T Chemical/Biochemical Engineering degree.

Civil Engineering Group 2 Major Requirements

<u>Partner School</u>		<u>Semester</u>	<u>Missouri S&T</u>		
GEN 102 or COM 100 HIS 121 or HIS 122 or POL 102 PHY 332	Written Communication or Fundamentals of Speech and Communication The American Context to 1865 or The American Context, 1865 to Present or American National Government Analytical Mechanics (Statics)	3 3	ENGLISH 1160 or SPMS 1185 HISTORY 1300 or HISTORY 1310 or POL SCI 1200 CIV ENG 2200	Writing and Research or Principles of Speech American History to 1877 or American History since 1877 or American Government Engineering Mechanics-Statics Humanities/Social Science Elective Maximum Free Electives	3 3 3 0
		<i>See your advisor for course options.</i>			
		<i>No free electives applied to the degree.</i>			
		Group 2 Major Requirements Group 1 Core Requirements		Group 2 Major Requirements Group 1 Core Requirements	12 30
Total Hours		46		Total Hours*	42

*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>Partner School</u>		<u>Semester</u>	<u>Missouri S&T</u>		
COM 100 GEN 102 HIS 121 or HIS 122 or POL 102	Fundamentals of Speech Communication Written Communication The American Context to 1865 or The American Context, 1865 to Present or American National Government	3 3 3	SPMS 1185 ENGLISH 1160 HISTORY 1300 or HISTORY 1310 or POL SCI 1200 CIV ENG 2200 and MECH ENG 2350*	Public Speaking Writing and Research American History to 1877 or American History since 1877 or American Government Engineering Mechanics-Statics and Engineering Mechanics-Dynamics* (*Will be substituted for MECH ENG 2350 Engineering Mechanics-Dynamics for the following engineering majors: electrical, computer, engineering management.) (Both courses combined will satisfy a required engineering science elective.)	3 3 3 6
CHE 302 & PHY 443	Analytical Mechanics (Statics) & Classical Mechanics	6			
MAT 281	Applied Linear Algebra <i>See your advisor for course options.</i> <i>See your advisor for course options.</i>	3	MATH 3108	Linear Algebra (Will satisfy a required math elective.) Humanities/Social Science Elective Maximum Free Electives	3 3 3
		Group 2 Major Requirements Group 1 Core Requirements		Group 2 Major Requirements Group 1 Core Requirements	24 30
Total Hours		55		Total Hours*	54

*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>Partner School</u>		<u>Semester</u>	<u>Missouri S&T</u>		
COM 100 GEN 102 HIS 121 or HIS 122 or POL 102	Fundamentals of Speech Communication Written Communication The American Context to 1865 or The American Context, 1865 to Present or American National Government	3 3 3	SPMS 1185 ENGLISH 1160 HISTORY 1300 or HISTORY 1310 or POL SCI 1200 CIV ENG 2200 and MECH ENG 2350*	Public Speaking Writing and Research American History to 1877 or American History since 1877 or American Government Engineering Mechanics-Statics and Engineering Mechanics-Dynamics* (*Will be substituted for MECH ENG 2350 Engineering Mechanics-Dynamics for the following engineering majors: electrical, computer, engineering management.) (Both courses combined will satisfy a required engineering science elective.)	3 3 3 6
CHE 302 & PHY 443	Analytical Mechanics (Statics) & Classical Mechanics	6			
MAT 281	Applied Linear Algebra <i>See your advisor for course options.</i> <i>See your advisor for course options.</i>	3	MATH 3108	Linear Algebra Humanities/Social Science Elective Maximum Free Electives	3 3 3
		Group 2 Major Requirements Group 1 Core Requirements		Group 2 Major Requirements Group 1 Core Requirements	24 30
Total Hours		55		Total Hours*	54

*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>Partner School</u>		<u>Semester</u>	<u>Missouri S&T</u>		
PSY 101	Basic Psychology	3	PSYCH 1101	General Psychology	3
HIS 121 or HIS 122 or POL 102	The American Context to 1865 or The American Context, 1865 to Present or American National Government	3	HISTORY 1300 or HISTORY 1310 or POL SCI 1200	American History to 1877 or American History since 1877 or American Government	3
GEN 102 or COM 100	Written Communication or Fundamentals of Speech and Communication		ENGLISH 1160 or SPMS 1185	Writing and Research or Principles of Speech	3
PHY 332	Analytical Mechanics (Statics)	3	CIV ENG 2200	Engineering Mechanics-Statics	3
PHY 443	Classical Mechanics	3	MECH ENG 2350*	Engineering Mechanics-Dynamics* (*Will be substituted for MECH ENG 2350 Engineering Mechanics-Dynamics for the following engineering majors: electrical, computer, engineering management.)	3
			Humanities/Social Science Elective		3
			Maximum Free Electives		3
			Group 2 Major Requirements		21
			Group 1 Core Requirements		30
Total Hours					51

*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>Partner School</u>		<u>Semester</u>	<u>Missouri S&T</u>		
GEN 102 or COM 100	Written Communication or Fundamentals of Speech and Communication	3	ENGLISH 1160 or SPMS 1185	Writing and Research or Principles of Speech	3
HIS 121 or HIS 122	The American Context to 1865 or The American Context, 1865 to Present	3	HISTORY 1300 or HISTORY 1310	American History to 1877 (preferred) or American History since 1877 (preferred)	3
CHE 122	General Chemistry II and Lab	5	CHEM 1320	General Chemistry II	3
PHY 332	Analytical Mechanics (Statics)	3	CIV ENG 2200	Engineering Mechanics-Statics	3
			Humanities/Social Science Elective		3
			Maximum Free Electives		0
			Group 2 Major Requirements		15
			Group 1 Core Requirements		30
Total Hours					45

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

Geological Engineering Group 2 Major Requirements

<u>Partner School</u>		<u>Semester</u>	<u>Missouri S&T</u>		
GEN 102 or COM 100	Written Communication or Fundamentals of Speech and Communication	3	ENGLISH 1160 or SPMS 1185	Writing and Research or Principles of Speech	3
HIS 121 or HIS 122 or POL 102	The American Context to 1865 or The American Context, 1865 to Present or American National Government	3	HISTORY 1300 or HISTORY 1310 or POL SCI 1200	American History to 1877 or American History since 1877 or American Government	3
PHY 332	Analytical Mechanics (Statics)	3	CIV ENG 2200	Engineering Mechanics-Statics	3
CHE 122 or CHHE 301	General Chemistry II or Organic Chemistry I	4	CHEM 1320 or CHEM 2210	General Chemistry II or Organic Chemistry I <small>or any 3-hour course in chemistrv, geochemistrv, or biologv</small>	3
			Humanities/Social Science Elective		3
			Humanities/Social Science Elective		3
			Maximum Free Electives		0
			Group 2 Major Requirements		15
			Group 1 Core Requirements		30
Total Hours					45

*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>Partner School</u>	<u>Semester</u>		<u>Missouri S&T</u>
HIS 121 or	The American Context to 1865 or		HISTORY 1300 or	American History to 1877 or
HIS 122 or	The American Context, 1865 to Present or	3	HISTORY 1310 or	American History since 1877 or
POL 102	American National Government		POL SCI 1200	American Government
GEN 102 or	Written Communication or		ENGLISH 1160 or	Writing and Research or
COM 100	Fundamentals of Speech and Communication	3	SPMS 1185	Principles of Speech
PHY 332	Analytical Mechanics (Statics)	3	CIV ENG 2200	Engineering Mechanics-Statics
MAT 281	Applied Linear Algebra	3	MATH 3108	Linear Algebra I
				(Will satisfy the Advanced Math/Comp Sci elective requirement.)
				Literature Elective
				Humanities/Social Science Elective
				Maximum Free Electives
	Group 2 Major Requirements	6		Group 2 Major Requirements
	Group 1 Core Requirements	37		Group 1 Core Requirements
	Total Hours	43		Total Hours*
				12
				30
				42

*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>Partner School</u>	<u>Semester</u>		<u>Missouri S&T</u>
GEN 102 or	Written Communication or		ENGLISH 1160 or	Writing and Research or
COM 100	Fundamentals of Speech and Communication	3	SPMS 1185	Principles of Speech
HIS 121 or	The American Context to 1865 or		HISTORY 1300 or	American History to 1877 or
HIS 122 or	The American Context, 1865 to Present or	3	HISTORY 1310 or	American History since 1877 or
POL 102	American National Government		POL SCI 1200	American Government
PHY 332	Analytical Mechanics (Statics)	3	CIV ENG 2200	Engineering Mechanics-Statics
CHE 122	General Chemistry II and Lab	5	CHEM 1320	General Chemistry II
CHE 301	Organic Chemistry I	4	CHEM 2210	Organic Chemistry I
				<i>Not specifically required for the degree but will satisfy Out-of-Department Technical Elective Requirement</i>
				Humanities/Social Science Elective
				Humanities/Social Science Elective
				Maximum Free Electives
	Group 2 Major Requirements	18		Group 2 Major Requirements
	Group 1 Core Requirements	37		Group 1 Core Requirements
	Total Hours	55		Total Hours*
				26
				30
				56

*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>Partner School</u>		<u>Semester</u>	<u>Missouri S&T</u>		
GEN 102	Written Communication	3	ENGLISH 1160	Writing and Research	3
HIS 121 or	The American Context to 1865 or		HISTORY 1300 or	American History to 1877 or	
HIS 122 or	The American Context, 1865 to Present or	3	HISTORY 1310 or	American History since 1877 or	3
POL 102	American National Government		POL SCI 1200	American Government	
<i>See your advisor for course options.</i>			Humanities/Social Science Elective		3
<i>See your advisor for course options.</i>			Humanities/Social Science Elective		3
<i>No free electives applied to the degree.</i>			Maximum Free Electives		0
Group 2 Major Requirements		6	Group 2 Major Requirements		12
Group 1 Core Requirements		37	Group 1 Core Requirements		30
Total Hours		43	Total Hours*		42

*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>Partner School</u>		<u>Semester</u>	<u>Missouri S&T</u>		
GEN 102	Written Communication	3	ENGLISH 1160	Writing and Research	3
HIS 121 or	The American Context to 1865 or		HISTORY 1300 or	American History to 1877 or	
HIS 122 or	The American Context, 1865 to Present or	3	HISTORY 1310 or	American History since 1877 or	3
POL 102	American National Government		POL SCI 1200	American Government	
PHY 332	Analytical Mechanics (Statics)	3	CIV ENG 2200	Engineering Mechanics-Statics	3
PHY 332	Analytical Mechanics (Statics)	3	CIV ENG 2210	Mechanics of Materials	3
<i>See your advisor for course options.</i>			Humanities/Social Science Elective		3
<i>See your advisor for course options.</i>			Humanities/Social Science Elective		3
<i>See your advisor for course options.</i>			Maximum Free Electives		6
Group 2 Major Requirements		12	Group 2 Major Requirements		24
Group 1 Core Requirements		37	Group 1 Core Requirements		30
Total Hours		49	Total Hours*		54

*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>Partner School</u>		<u>Semester</u>	<u>Missouri S&T</u>		
GEN 102	Written Communication	3	ENGLISH 1160	Writing and Research	3
HIS 121 or	The American Context to 1865 or		HISTORY 1300 or	American History to 1877 or	
HIS 122 or	The American Context, 1865 to Present or	3	HISTORY 1310 or	American History since 1877 or	3
POL 102	American National Government		POL SCI 1200	American Government	
PHY 332	Analytical Mechanics (Statics)	3	CIV ENG 2200	Engineering Mechanics-Statics	3
<i>See your advisor for course options.</i>			Humanities/Social Science Elective		3
<i>See your advisor for course options.</i>			Humanities/Social Science Elective		3
<i>No free electives applied to the degree.</i>			Maximum Free Electives		0
Group 2 Major Requirements		3	Group 2 Major Requirements		9
Group 1 Core Requirements		37	Group 1 Core Requirements		30
Total Hours		40	Total Hours*		39

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