Morehouse College — Missouri S&T

General Engineering

Transfer Guide Effective as of Fall 2025

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

Students are not required to complete all courses on this guide before transferring to Missouri S&T.

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.

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	Morehouse College		Semeste	<u>:</u>	Missouri S&T	
MTH 161	Calculus I	4		MATH 1214	Calculus I Grade of C or better is required.	4
MTH 162* and MTH 263*	Calculus II* and Calculus III* *The combination of Morehouse MTH 162 and 263 is equivalent to the combination of Missouri SAT MATH 1215 and 2222. Both courses must be taken to receive credit.	8		MATH 1215* and MATH 2222*	Calculus II* and Calculus III* A grade of C or better is required in both courses. *The combination of Morehouse MTH 162 and 263 is equivalent to the combination of Missouri S&T MATH 1215 and 2222. Both courses must be taken to receive credit.	8
MTH 321	Intro to Ordinary Differential Equations	3		MATH 3304	Elementary Differential Equations	3
PHY 154	Mechanics	4		PHYSICS 1135	Engineering Physics I Grade of C or better is required.	4
PHY 253	Electricity and Magnetism	4		PHYSICS 2135	Engineering Physics II Grade of C or better is required.	4
EGR 101* and EGR 103*	Freshman Engineering Design* (3) and Engineering Graphics* (3) The combination of Morehouse EGR 101 and EGR 103 is equivalent to the combination of Missouri SAT FR ENG 1100 and MECH ENG 1720. Both courses must be taken to receive credit.	6		FR ENG 1100* and MECH ENG 1720*	Study and Careers in Engineering and Computing* (1) and Engineering Design with Computer Applications* (3) The combination of Morebouse EGR 101 and 103 is equivalent to the combination of Missorii S&T FR ENG 1100 and MECH ENG 1720. Both courses must be taken to receive credit. MECH ENG 1720 is not an S&T degree requirement for Computer Engineering or Biomedical Engineering.	4
ENG 101 UI	Ligisti Composition to to	3		ENGLISH 1120	Exposition and Argumentation	3
	Total Hours	32			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

Biomedical Engineering/Biomanufacturing or Biomaterials

Ceramic Engineering

Chemical Engineering and 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.

This transfer guide is published by Missouri University of Science and Technology and is in effect as of Fall 2025.
Further information or updates are available from Missouri S&T Transfer Admissions at transfer.mst.edu, transfer@mst.edu, or 800-522-0938

	Aerospace Enç	gineerii	ng	Gro u	ıp 2 Major R	equirements	
	Morehouse College			Semeste	,	Missouri S&T	
ENG 102 or ENG 393 or COM 253	English Composition or Business and Professional Writing or Public Speaking		3		ENGLISH 1160 or ENGLISH 3560 or SPMS 1185	Writing and Research or Technical Writing or Principles of Speech Applies to degree as Gen Ed Communication requirement.	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab		4		CHEM 1310*, 1319	General Chemistry I* and Lab *CHEM 1310 will be substituted for CHEM 1305.	5
CSC 110 or CSC 160	Computer Programming I or Computer Programming II		3		COMP SCI 1971,1981	Intro to Programming Methodology and Lab* C++)	3
EGR 205 EGR 206	Engineering Statics Mechanics of Materials		3		CIV ENG 2200 CIV ENG 2210	Engineering Mechanics-Statics Mechanics of Materials	3
MTH 271 or MTH 341	Intro to Linear Algebra or Probability and Statistics I		3		MATH 3108 or STAT 3115	Linear Algebra I or Engineering Statistics Satisfies the Advanced Math/Comp Sci elective requirement.	3
PHI 302	Intro to Philosophical Ethics or other engineering, business, bio, social ethics approved by advisor		3		PHILOS 1130	How Should I Live? An Introduction to Ethics or other engineering, business, bio, social ethics approved by advisor	3
	6 hours H	umanities and F havioral and So TORY 1200, 13	ine / cial s 300,	Arts from at I Sciences from	•	and Dines.	
	,				o specific disciplines.		
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature I or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music *Satisfes the State of Missouri government requirement.		6		ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or HISTORY 1300* or HISTORY 1310* or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1800 to 1865 or American Literature: 1805 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation **Sattlifes the State of Missouri government requirement.	6
		Behav	viora	al and Soci	al Sciences		
HIS 111 or HIS 112* or PHI 201 or PHI 301 or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.		6		o specific disciplines. HISTORY 1100 or HISTORY 1200* or PHILOS 1105 or PHILOS 1115 or POL SCI 1200* or PSYCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Early Western Civilization or Modern Western Civilization* or Self and World: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government*or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	6
		Humaniti		Arts, and S Select 3 hou	ocial Sciences rs.		
HASS Elective	Humanities, Arts, Social Sciences Elective: Any his music, theater, English and technical communication philosophy, political science, psychology, economics etymology, or foreign language.	n,	3		HASS Elective	Humanities, Arts, Social Sciences Elective: Any history, art, music, theater, English and technical communication, philosophy, political science, psychology, economics, etymology, or foreign language.	3
	No free electives applied to the degree. Group 2 Major Requirements Group 1 Core Requirements	3	0 37 32 69			Maximum Free Electives Group 2 Major Requirements Group 1 Core Requirements Total Hours* *S&T advisor permission is required to transfer more than 68 credits toward the S&T Aerospace Engineering degree.	0 38 30 68

	Architectural Eng	gineerii	ng Gro	up 2 Major	Requirements	
	Morehouse College		Semester	·	Missouri S&T	
ENG 102 or ENG 393 or COM 253	English Composition or Business and Professional Writing or Public Speaking	3		ENGLISH 1160 or ENGLISH 3560 or SPMS 1185	Writing and Research or Technical Writing or Principles of Speech Applies to degree as Gen Ed Communication requirement.	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab	4		CHEM 1310*, 1319	General Chemistry I* and Lab *CHEM 1310 will be substituted for CHEM 1305.	5
EGR 205	Engineering Statics	3		CIV ENG 2200	Engineering Mechanics-Statics	3
EGR 208	Engineering Dynamics	3		MECH ENG 2350	Engineering Mechanics-Dynamics	2
EGR 206	Mechanics of Materials	3		CIV ENG 2210	Mechanics of Materials	3
MTH 341	Probability and Statistics I	3		STAT 3115*	Engineering Statistics* *Will be substituted for STAT 3113.	3
	6 hours Beha *At least one course must be selected from HIST	ovioral and Socia ORY 1200, 1300 Hum	I Sciences fron , 1310, or POI anities and F	ine Arts	plines.	
		elect 6 hours fro	m at least two	o specific disciplines.		
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature I or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music "Satisfies the State of Missouri government requirement.	6		ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or HISTORY 1300° or HISTORY 1310° or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1800 to 1865 or American Literature: 1865 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation 3atisfies the State of Missouri government requirement.	6
	0.1.401		ral and Socia		DV 4000	
	World History: Topical Approaches*		o specific disc	ciplines to include HISTO	RY 1200. Modern Western Civilization*	
HIS 112*	*Satisfies the State of Missouri Government requirement.	3		HISTORY 1200*	*Satisfies the State of Missouri Government requirement.	3
PHI 201 or PHI 301 or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	3		PHILOS 1105 or PHILOS 1115 or POL SCI 1200° or PSYCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Self and World: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government* or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Miscouri government requirement.	3
	No free electives applied to the degree.	0			Maximum Free Electives	0
	Group 2 Major Requirements	31			Group 2 Major Requirements	31
	Group 1 Core Requirements T	otal Hours 63			Group 1 Core Requirements Total Hours *\$&T advisor permission is required to transfer more than 69 credits toward the \$&T Architectural Engineering degree.	30 * 61

		_		_	-Biomanufa equirements		
	Morehouse College		5	Semester	1	Missouri S&T	
COM 253	Public Speaking		3		SP&MS 1185	Principles of Speech Applies to degree as Gen Ed Communication requirement.	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab		4		CHEM 1310, 1319	General Chemistry I and Lab	5
CHE 112, 112L	Elementary Inorganic Chemistry II and Lab		4		CHEM 1320, 1510*	General Chemistry II (3) and Qualitative Analysis (2)	3
CHE 231, 231L	Elementary Organic Chemistry I and Lab		4		CHEM 2210, 2219	*CHEM 1510 is not a degree requirement, transfers as general elective credit. Organic Chemistry I and Lab	4
CHE 232, 232L or BIO 111, 111L or BIO 215	Elementary Organic Chemistry II and Lab or Cell and Molecular Biology or Molecular Genetics		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 Applies to degree as Track Elective.	4
BIO 351, 351L	Cell Biology and Lab		4		BIO SCI 2213, 2219	Cell Biology and Lab	4
CSC 110 or CSC 160	Computer Programming I or Computer Programming II		3		COMP SCI 1971,1981*	Intro to Programming Methodology and Lab* C++) *Will be substituted for COMP SCI 1500.	3
	6 hours	Humanities and Behavioral and S ISTORY 1200, 1	Fine A ocial So 1 300, 1 3	rts from at le	•	and ines.	
					specific disciplines.		
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature I or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music 'Satisfies the State of Missouri government requirement.		6		ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1221 or ENGLISH 1231 or HISTORY 1300* or HISTORY 1310* or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1600 to 1865 or American Literature: 1600 to 1865 or American Literature: 1865 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation *Satisfies the State of Missouri government requirement.	6
	-	Beha	avioral	l and Socia	I Sciences		
HIS 111 or HIS 112* or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.		3	elect 3 houi	S. HISTORY 1100 or HISTORY 1200* or POL SCI 1200* or PSYCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Early Western Civilization or Modern Western Civilization* or American Government* or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	3
				Arts, and So ISH 3560 re	ocial Sciences quired.		
ENG 393	Business and Professional Writing		3		ENGLISH 3560	Technical Writing	3
	No free electives applied to the degree. Group 2 Major Requirements Group 1 Core Requirements	Total Hours	0 38 32 70			Maximum Free Electives Group 2 Major Requirements Group 1 Core Requirements Total Hours* *S&T advisor permission is required to transfer more than 69 credit hours toward the degree.	0 38 30 68

	Biomed	ical E	๊ทธุ	gineering-Biomater	ials	
	Gro	up 2	Ma	ajor Requirements		
	Morehouse College			Semester	Missouri S&T	
COM 253	Public Speaking		3	SP&MS 1185	Principles of Speech	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab		4	CHEM 1310, 1319	Applies to degree as Gen Ed Communication requirement. General Chemistry I and Lab	5
CHE 112, 112L	Elementary Inorganic Chemistry II and Lab		4	CHEM 1320, 1510*	General Chemistry II (3) and Qualitative Analysis (2) *CHEM 1510 is not a degree requirement, transfers as general elective credit.	3
CHE 231, 231L	Elementary Organic Chemistry I and Lab		4	CHEM 2210, 2219*	*CHEM 1510 is not a degree requirement, transiters as general elective credit. Organic Chemistry I and Lab* *CHEM 2219 Lab applies to the degree as a Track Elective (non-engineering).	4
CHE 232, 232L	Elementary Organic Chemistry II and Lab		4	CHEM 2220, 2229*	Organic Chemistry II and Lab* CHEM 2229 Lab applies to the degree as a Track Elective (non-engineering).	4
BIO 111, 111L	Cell and Molecular Biology		4	BIO SCI 1113*, 1219*	General Biology* and Lab* *Applies to degree as Track Elective (Non-engineering).	4
BIO 351, 351L	Cell Biology and Lab		4	BIO SCI 2213, 2219	Cell Biology and Lab	4
CSC 110 or CSC 160	Computer Programming I or Computer Programming II		3	COMP SCI 1971,1981*	Intro to Programming Methodology and Lab* C++) *Will be substituted for COMP SCI 1500.	3
EGR 205	Engineering Statics		3	CIV ENG 2200 Sciences General Education Requirer	Engineering Mechanics-Statics	3
	6 hours Hu	manities and avioral and S	Fine ocial	ach group below, select 15 hours to includ Arts from at least two specific disciplines at Sciences from at least two specific disciplin 1310, or POL SCI 1200 to satisfy the Sta	nd nes.	
				nities and Fine Arts		
ENG 271 or		elect 6 hours	s fror	n at least two specific disciplines. ENGLISH 1211 or	D. 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
ENG 277 or ENG 363 or ENG 364 or ENG 250 or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature I or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music *Satisfes the State of Missouri government requirement.		6	ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or HISTORY 1300* or HISTORY 1310* or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1600 to 1865 or American Literature: 1865 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation **Sattsfies the State of Missouri government requirement.	6
		Beha	avior	al and Social Sciences		
				Select 3 hours.		
HIS 111 or HIS 112* or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.		3	HISTORY 1100 or HISTORY 1200* or POL SCI 1200* or PSYCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Early Western Civilization or Modern Western Civilization* or American Government* or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language **satisfies the State of Missouri government requirement.	3
				Arts, and Social Sciences		
ENG 393	Business and Professional Writing	E	ENG 3	LISH 3560 required. ENGLISH 3560	Technical Writing	3
	No free electives applied to the degree.		0		Maximum Free Electives	0
	Group 2 Major Requirements		45		Group 2 Major Requirements	45
	Group 1 Core Requirements		32		Group 1 Core Requirements	30
	1	otal Hours	77		Total Hours* *S&T advisor permission is required to transfer more than 69 credits toward the S&T Biomedical Engineering degree.	75

	Ceramic Enginee	ring	Group 2 Maj	or Requirements		
	Morehouse College		Semester	Missouri S&T		
ENG 102 or ENG 393 or COM 253	English Composition or Business and Professional Writing or Public Speaking	3	ENGLISH 11 ENGLISH 35 SPMS 1185		iirement.	3
EGR 205	Engineering Statics	3	CIV ENG 220	3 3		3
EGR 206	Mechanics of Materials		CIV ENG 22			3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab	4	CHEM 1310,	Comment Chambinshir, II (2) and Ovalit	ativo Analysis (2)	5
CHE 112	Elementary Inorganic Chemistry II	3	CHEM 1320,	*CHEM 1510 is not a degree requirement, transfer	rs as general elective credit.	3
CHE 231 or CHE 321	Elementary Organic Chemistry I (4) or Elementary Physical Chemistry (3)	3	CHEM 2210, CHEM 2310	Organic Chemistry I (3) and Lab* (1 Inorganic Chemistry I (3) Satisfies the advanced chemistry elective requirer The lab is not a degree requirement, transfers as	nent.	3
MTH 341	Probability and Statistics	3	STAT 3115	Engineering Statistics or any statistics course 3000-level or higher. Satis	sfies statistics elective requirement.	3
PHY 254	Optics and Modern Physics	4	PHYS 2305	Intro to Modern Physics		3
	6 hours Humanitie	es and Fine and Socia 1200, 1300	each group below, select 15 Arts from at least two specifications from at least two s Colored From at least two s Colored From at least two s Colored From Arts	c disciplines and pecific disciplines.	ment.	
	Select 6		m at least two specific disc	iplines.		
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature I or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music *Satisfies the State of Missouri government requirement.	6	ENGLISH 12 ENGLISH 12 ENGLISH 12 ENGLISH 12 ENGLISH 12 HISTORY 13 ART 1180 or MUSIC 1150	12 or British Literature II: 1800 to Presen 21 or American Literature: 1600 to 1865 22 or American Literature: 1865 to Prese 31 or World Literature I: Beginnings to th 00* or American History to 1877* or Art Appreciation or	t or int or e Renaissance or ition	6
		Behavio	ral and Social Sciences			
		hours fro	m at least two specific disc	•		
HIS 112* or HIS 112* or PHI 201 or PHI 301 or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	6	HISTORY 11 HISTORY 12 PHILOS 110: PHILOS 111: POL SCI 12C PSVCH 1101 ECON 1100 ECON 1200 Foreign Lang	00° or Modern Western Civilization° or 5 or Self and World: Intro to Philosophy 5 or Logic and Reasoning: An Introducti 100° or American Government° or General Psychology or principles of Microeconomics or Principles of Macroeconomics or	ion or I Language	6
	Hu	umanities	, Arts, and Social Science Select 3 hours.	S		
HASS Elective	Humanities, Arts, Social Sciences Elective: Any history, art music, theater, English and technical communication, philosophy, political science, psychology, economics, etymology, or foreign language.	3	HASS Electiv	Humanities, Arts, Social Sciences I music, theater, English and technic philosophy, political science, psych etymology, or foreign language.	al communication,	3
	No free electives applied to the degree.	0		Maximum Free Electives		0
	Group 2 Major Requirements	41		Group 2 Major Requirements		41
	Group 1 Core Requirements	32		Group 1 Core Requirements		30
	Total H	ours 73		*S&T advisor permission is required to transfer mo Ceramic Engineering degree.	Total Hours* ore than 68 credits toward the S&T	71

	C Chemical Engineer		ngineering or hemical Engine	ering Emphasis	
	Gro	up 2 Majo	r Requirements		
	Morehouse College	Sei	mester	Missouri S&T	
COM 253	Public Speaking	3	SP&MS 1185	Principles of Speech Applies to degree as Gen Ed Communication requirement.	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab	4	CHEM 1310, 1319	General Chemistry I and Lab	5
CHE 112	Elementary Inorganic Chemistry II	3	CHEM 1320, 1510*	General Chemistry II (3) and Qualitative Analysis* (2) *CHEM 1510 is not a degree requirement, transfers as general elective credit.	3
CHE 231, 231L	Elementary Organic Chemistry I and Lab	4	CHEM 2210, 2219*	Organic Chemistry I and Lab* *CHEM 210 is a degree requirement. CHEM 2219 applies to the degree as 1 of 9 required science elective credits See note below.	4
CHE 232, 232L or BIO 351, 351L or BIO 321-322, 321-322L	Elementary Organic Chemistry II and Lab (4) or Cell Biology and Lab (4) or Special Topics: Principles of Microbiology and Lab (4) Select up to 9 hours from these options or CHEM 2219 Organic Chemistry L		CHEM 2220 or BIO SCI 2213, 2219 or BIO SCI 3313, 3319	Organic Chemistry II (3) or Cell Biology and Lab (4) or Microbiology and Lab (5) Applies to the degree as required science elective credits. Select up to 9 hours from these options or CHEM 2219 Organic Chemistry Lab.	8
CSC 110 or CSC 160	Computer Programming I or Computer Programming II	3	COMP SCI 1971,1981*	Intro to Programming Methodology and Lab* C++) *Will be substituted for COMP SCI 1500.	3
MTH 341	Probability and Statistics I	3	STAT 3115*	Engineering Statistics* *Will be substituted for STAT 3113.	3
	From the o 6 hours Hur	ptions listed in each on manities and Fine Arts of vioral and Social Scier DRY 1200, 1300, 1310	•	ude and ines.	
	9.		s and Fine Arts east two specific disciplines.		
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature I or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music *Satisfies the State of Missouri government requirement.	6	ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or HISTORY 1300* or HISTORY 1310* or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1600 to 1865 or American Literature: 1865 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation *Satisfies the State of Missouri government requirement.	6
	Se		nd Social Sciences least two specific disciplines.		
HIS 111 or HIS 112* or PHI 201 or PHI 301 or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Pinciples of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government.	6	HISTORY 1100 or HISTORY 1200* or PHILOS 1105 or PHILOS 1115 or POL SCI 1200* or PSYCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Early Western Civilization or Modern Western Civilization* or Self and World: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government*or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	6
		,	, and Social Sciences		
ENG 393	Business and Professional Writing	ENGLISH 3	3560 required. ENGLISH 3560	Technical Writing	3
	No free electives applied to the degree.	0		Maximum Free Electives	0
	Group 2 Major Requirements Group 1 Core Requirements T	43 32 otal Hours 75		Group 2 Major Requirements Group 1 Core Requirements Total Hours* *S&T advisor permission is required to transfer more than 68 credits toward the S&T Chemical Engineering degree.	44 30 74

	Civil Engine	ering G	roup 2	? Major Req	uirements	
	Morehouse College		Semeste	r	Missouri S&T	
ENG 102 or ENG 393 or COM 253	English Composition or Business and Professional Writing or Public Speaking	3		ENGLISH 1160 or ENGLISH 3560 or SPMS 1185	Writing and Research or Technical Writing or Principles of Speech Applies to degree as Gen Ed Communication requirement.	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab	4		CHEM 1310, 1319	General Chemistry I and Lab	5
EGR 205	Engineering Statics	3		CIV ENG 2200	Engineering Mechanics-Statics	3
EGR 208	Engineering Dynamics	3		MECH ENG 2350	Engineering Mechanics-Dynamics	2
EGR 206	Mechanics of Materials	3		CIV ENG 2210	Mechanics of Materials	3
MTH 341	Probability and Statistics I	3		STAT 3115*	Engineering Statistics* *Will be substituted for STAT 3113.	3
	Humanities,	Arts, and Socia	l Sciences G	eneral Education Requ	irements	
	6 hours H	umanities and Fin havioral and Socia	e Arts from at al Sciences fro	elow, select 15 hours to in least two specific discipline m at least two specific disc L SCI 1200 to satisfy the	es and ciplines.	
			anities and F			
		Select 6 hours fro	om at least tw	o specific disciplines.		
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature I or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music *Satisfies the State of Missouri government requirement.	6		ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or HISTORY 1300° or HISTORY 1310° or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1800 to 1865 or American Literature: 1865 to Present or World Literature: 1865 to Present or World Literature: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation 'Satisfies the State of Missouri government requirement.	6
		Behavio	oral and Soci	al Sciences		
	\$	Select 6 hours fro	om at least tw	o specific disciplines.		
HIS 111 or HIS 112* or PHI 201 or PHI 301 or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *satisfies the State of Missouri government requirement.	6		HISTORY 1100 or HISTORY 1200* or PHILOS 1105 or PHILOS 1115 or POL SCI 1200* or PSYCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Early Western Civilization or Modern Western Civilization* or Self and Word: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government*or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	6
		Humanities	s, Arts, and S Select 3 hou	Social Sciences		
HASS Elective	Humanities, Arts, Social Sciences Elective: Any his music, theater, English and technical communication philosophy, political science, psychology, economics etymology, or foreign language.	n, 3		HASS Elective	Humanities, Arts, Social Sciences Elective: Any history, art, music, theater, English and technical communication, philosophy, political science, psychology, economics, etymology, or foreign language.	3
	No free electives applied to the degree. Group 2 Major Requirements Group 1 Core Requirements	0 34 32 Total Hours 66			Maximum Free Electives Group 2 Major Requirements Group 1 Core Requirements Total Hours* "S&T advisor permission is required to transfer more than 69 credits toward the S&T Civil Engineering degree.	0 34 30 64

	Computer Eng	ineerin	g	Group 2 Major R	equirements	
	Morehouse College			Semester	Missouri S&T	
0014.050		,			Principles of Speech	•
COM 253	Public Speaking	3		SPMS 1185	Applies to degree as Gen Ed Communication requirement.	3
CHE 111, 111L MTH 211 or	Elementary Inorganic Chemistry I and Lab Intro to Discrete Mathematics or	3		CHEM 1310, 1319 COMP SCI 1200	General Chemistry I and Lab Discrete Math for Computer Science	5
CSC 285 CSC 110 or	Discrete Structures Computer Programming I or	3		COMP SCI 1971.1981*	Intro to Programming Methodology and Lab*	3
EGR 205 or EGR 308 or PHY 254 or CHE 231, 231L or BIO 111 or BIO 215	Computer Programming II Engineering Statics (3) or Engineering Dynamics (3) or Optics & Modern Physics (4) or Elementary Organic Chemistry I (3) and Lab (1) or Cell and Molecular Biology (4) or Molecular Genetics (3)	3	3	CIV ENG 2200 or MECH ENG 2350 or PHYSICS 2305 or CHEM 2210, 2219* or BIO SCI 2213 or BIO SCI 2223	"Will be substituted for COMP SCI 1500. Engineering Mechanics-Statics (3) or Engineering Mechanics-Dynamics (2) or Intro to Modern Physics (3) or Organic Chemistry I (3) and Lab* (1) or Cell Biology (3) or General Genetics (3) Satisfies a required engineering/science elective. "CHEM 2219 is not a Missouri S&T degree requirement, will transfer as general elective credit.	3
MTH 271 or MTH 255	Intro to Linear Algebra or Intro to Set Theory	3	3	MATH 3108 or MATH 3109	Linear Algebra or Foundations of Mathematics Satisfies a required math elective.	3
MTH 341	Probability and Statistics I	3	3	STAT 3115*	Engineering Statistics* *Will be substituted for STAT 3117.	3
	6 hours Hi 6 hours Bel *At least one course must be selected from HIS	umanities and F navioral and Soc TORY 1200, 13 Hu	ine cial 00, ma	each group below, select 15 hours to ind Arts from at least two specific disciplines Sciences from at least two specific discip 1310, or POL SCI 1200 to satisfy the sanities and Fine Arts m at least two specific disciplines.	and blines.	
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature II or Survey of American Literature II or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music *Satisfies the State of Missouri government requirement.	6		ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or ENGLISH 1231 or HISTORY 1300* or HISTORY 1310* or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1600 to 1865 or American Literature: 1865 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation 'Satisfies the State of Missouri government requirement.	6
				ral and Social Sciences		
HIS 111 or HIS 112* or PHI 201 or PHI 301 or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	6	6	m at least two specific disciplines. HISTORY 1100 or HISTORY 1200* or PHILOS 1105 or PHILOS 1115 or POL SCI 1200* or PSYCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Early Western Civilization or Modern Western Civilization* or Self and World: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government*or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	6
		Humaniti		, Arts, and Social Sciences Select 3 hours.		
ENG 102 or ENG 393	English Composition or Business and Professional Writing	3	3	ENGLISH 1160 or ENGLISH 3560	Writing and Research or Technical Writing	3
Electives	Maximum Free Electives Group 2 Major Requirements Group 1 Core Requirements	3 4 3	0	Electives	Maximum Free Electives Group 2 Major Requirements Group 1 Core Requirements	3 41 30
		Total Hours 7	_		Total Hours' *S&T advisor permission is required to transfer more than 68 credits toward the S&T Computer Engineering degree.	

				2 Major Rec		
	Morehouse College		Semester		Missouri S&T	
COM 253	Public Speaking	3		SPMS 1185	Principles of Speech Applies to degree as Gen Ed Communication requirement.	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab	4		CHEM 1310, 1319	General Chemistry I and Lab	5
CSC 110 or CSC 160	Computer Programming I or Computer Programming II	3		COMP SCI 1971,1981*	Intro to Programming Methodology and Lab* *Will be substituted for COMP SCI 1500.	3
EGR 205 and EGR 308 (BOTH of the courses above or the course below.) OR PHY 254 or CHE 231, 231L or BIO 111 or BIO 215	Engineering Statics (3) and Engineering Dynamics (3) (Both courses above combined or the one course below will satisfy a required engineer science elective.) OR Optics and Modern Physics or Elementary Organic Chemistry I (3) and Lab* (1) or Cell and Molecular Biology (4) or Molecular Genetics (3)	ring 3		CIV ENG 2200 and MECH ENG 2350 BOTH of the courses above or ONE of the courses below. OR PHYSICS 2305 or CHEM 2210, 2219* or BIO SCI 2213 or BIO SCI 2223	Engineering Mechanics-Statics (3) and Engineering Mechanics-Dynamics (2) Both courses above combined or any one of the following courses will satisfy a required engineering science elective. OR Intro to Modern Physics (3) or Organic Chemistry I (3) and Lab* (1) or Cell Biology (3) or General Genetics (3) Satisfies a required engineering/science elective. **CHEM 2219 is not a Missouri S&T degree requirement, will transfer as general elective credit.	3
MTH 271	Intro to Linear Algebra	3		MATH 3108	Linear Algebra	3
MTH 341	Probability and Statistics I	3		STAT 3115*	Engineering Statistics* *Will be substituted for STAT 3117.	3
ENG 074	*At least one course must be selected from HISTORY 1: Select 6	<mark>200, 1300,</mark> Huma	1310, or POL Inities and Fi	ne Arts specific disciplines.	e of Missouri government requirement.	
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature I or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music **Satisfies the State of Missouri government requirement.	6		ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or HISTORY 1300* or HISTORY 1300* or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1600 to 1865 or American Literature: 1865 to Present or World Literature: 1865 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation *Satisfies the State of Missouri government requirement.	6
	0-14.0		ral and Socia			
HIS 111 or HIS 112* or PHI 201 or PHI 301 or PSC 251* or PSC 101 or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Morcoeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	6	iii at ieast two	specific disciplines. HISTORY 1100 or HISTORY 1200* or PHILOS 1105 or PHILOS 1115 or POL SCI 1200* or PSYCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Early Western Civilization or Modern Western Civilization* or Self and World: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government*or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government.	6
	Hu		Arts, and So Select 3 hour	ocial Sciences		
ENG 102 or ENG 393	English Composition or Business and Professional Writing	3		ENGLISH 1160 or ENGLISH 3560	Writing and Research or Technical Writing	3
Electives	Maximum Free Electives	6		Electives	Maximum Free Electives	6
	Group 2 Major Requirements Group 1 Core Requirements Total Ho	40 32 ours 72			Group 2 Major Requirements Group 1 Core Requirements Total Hours* *S&T advisor permission is required to transfer more than 68 credits toward the S&T	41 30 71

	Engineering Ma	anageme	nt Gro	oup 2 Major F	Requirements	
	Morehouse College		Semeste	er	Missouri S&T	
COM 253	Public Speaking	3		SPMS 1185	Principles of Speech	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab	4		CHEM 1310, 1319	Applies to degree as Gen Ed Communication requirement. General Chemistry I and Lab	5
CSC 110 or	Computer Programming I or	3		COMP SCI 1971, 1981	Intro to Programming Method and Lab (C++)	3
CSC 160	Computer Programming II				, ,	
EGR 205 EGR 208	Engineering Statics Engineering Dynamics	3		CIV ENG 2200 MECH ENG 2350	Engineering Mechanics-Statics	3 2
EGR 206 EGR 206	Mechanics of Materials	3		CIV ENG 2350	Engineering Mechanics-Dynamics Mechanics of Materials	3
MTH 341	Probability and Statistics I	3		STAT 3115	Engineering Statistics	3
			l Sciences G	Seneral Education Requir		
	6 hours 6 hours E	Humanities and Fin Behavioral and Socia	e Arts from at al Sciences fro	pelow, select 15 hours to incl least two specific disciplines om at least two specific discip	and lines.	
	*At least one course must be selected from H	•		•	tate of Missouri government requirement.	
			anities and	Fine Arts vo specific disciplines.		
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature II or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music *Satisfies the State of Missouri government requirement.	6		ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or HISTORY 1300* or HISTORY 1310* or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1600 to 1865 or American Literature: 1600 to 1865 or American Literature: 1865 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation *Satisfies the State of Missouri government requirement.	6
				ial Sciences		
			wo specific d	isciplines to include PSYCH	l 1101.	
PSY 101	Intro to Psychology	3		PSYCH 1101	General Psychology Required	3
HIS 111 or HIS 112* or PHI 201 or PPI 301 or PSC 251* or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or Intro to Philosophy or Formal Logic or National Government* or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	3		HISTORY 1100 or HISTORY 1200* or PHILOS 1105 or PHILOS 1115 or POL SCI 1200* or ECON 1100 or ECON 1200 or Foreign Language	Early Western Civilization or Modern Western Civilization* or Self and World: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government*or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	3
		Humanities		Social Sciences		
ENG 102 or ENG 393	English Composition or Business and Professional Writing	3	Select 3 ho	urs. ENGLISH 1160 or ENGLISH 3560	Writing and Research or Technical Writing	3
	No free electives applied to the degree. Group 2 Major Requirements Group 1 Core Requirements	0 37 32 Total Hours 69		Electives	Maximum Free Electives Group 2 Major Requirements Group 1 Core Requirements Total Hours* *S&T advisor permission is required to transfer more than 61 credits toward the S&T Engineering Management degree.	0 37 30 61

	Environmental Er	gineer	ing Gr	oup 2 Major	Requirements	
	Morehouse College		Semester	<u>r</u>	Missouri S&T	
ENG 102 or ENG 393 or COM 253	English Composition or Business and Professional Writing or Public Speaking	3		ENGLISH 1160 or ENGLISH 3560 or SPMS 1185	Writing and Research or Technical Writing or Principles of Speech Applies to degree as Gen Ed Communication requirement.	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab	4		CHEM 1310, 1319	General Chemistry I and Lab	5
CHE 112	Elementary Inorganic Chemistry II	3		CHEM 1320, 1510*	General Chemistry II (3) and Qualitative Analysis (2) *CHEM 1510 is not a degree requirement, transfers as general elective credit.	3
BIO 101 or BIO 113	Biological Science for Non-Majors (3) or Comprehensive Biology (4)	3		BIO SCI 1113, 1219*	General Biology (3) and Lab* (1) *The lab is not a degree requirement, transfers as general elective credit.	3
EGR 205	Engineering Statics	3		CIV ENG 2200	Engineering Mechanics-Statics	3
EGR 208	Engineering Dynamics	3		MECH ENG 2350	Engineering Mechanics-Dynamics	2
EGR 206	Mechanics of Materials	3		CIV ENG 2210	Mechanics of Materials	3
MTH 341	Probability and Statistics I	3		STAT 3115*	Engineering Statistics* *Will be substituted for STAT 3113.	3
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	6 hours Beha *At least one course must be selected from HIST	ovioral and Social ORY 1200, 1300 Hum	I Sciences from 1, 1310, or POI anities and F	•	plines.	6
	*Satisfies the State of Missouri government requirement.	Daharda		-l O-i	*Satisfies the State of Missouri government requirement.	
	Select 6 hours		oral and Soci	ar Sciences ciplines to include HISTC	DRY 1200	
HIS 112*	World History: Topical Approaches* *Satisfies the State of Missouri Government requirement.	3	•	HISTORY 1200*	Modern Western Civilization* *Satisfies the State of Missouri Government requirement.	3
PHI 201 or PHI 301 or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	3		PHILOS 1105 or PHILOS 1115 or POL SCI 1200° or PSYCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Self and World: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government* or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language "Satisfies the State of Missouri government requirement.	3
	No free electives applied to the degree.	0			Maximum Free Electives	0
	Group 2 Major Requirements Group 1 Core Requirements T	37 32 otal Hours 69			Group 2 Major Requirements Group 1 Core Requirements Total Hours *S&T advisor permission is required to transfer more than 69 credits toward the S&T Environmental Engineering degree.	37 30 s* 67

	Geological Eng	ineering	g Grou	p 2 Major Re	equirements	
	Morehouse College		Semester		Missouri S&T	
ENG 393	Business and Professional Writing	3		ENGLISH 3560	Technical Writing	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab	4		CHEM 1310, 1319	Applies to degree as Gen Ed Communication requirement. General Chemistry I and Lab	5
CSC 110 or CSC 160	Computer Programming I or Computer Programming II	3		COMP SCI 1971, 1981	Intro to Programming Method and Lab (C++)	3
EGR 205	Engineering Statics	3		CIV ENG 2200	Engineering Mechanics-Statics	3
EGR 208	Engineering Dynamics	3		MECH ENG 2350	Engineering Mechanics-Dynamics	2
EGR 206	Mechanics of Materials	3		CIV ENG 2210	Mechanics of Materials	3
MTH 341	Probability and Statistics I	3		STAT 3115	Engineering Statistics	3
	From the c 6 hours Hu 6 hours Beha	options listed in e manities and Fine avioral and Social	each group be Arts from at le I Sciences fror	eneral Education Require elow, select 15 hours to include east two specific disciplines and teast two specific disciplines	ude and ines.	
	*At least one course must be selected from HIST			•	ate of Missouri government requirement.	
	S		anities and F	o specific disciplines.		
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature I or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music "Satisfies the State of Missouri government requirement.	6		ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or HISTORY 1300* or HISTORY 1310* or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1600 to 1865 or American Literature: 1865 to Present or World Literature: 1865 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation Satisfies the State of Missouri government requirement.	6
			ral and Socia			
HIS 111 or HIS 112* or PHI 201 or PHI 301 or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language "Satisfies the State of Missouri government requirement.	6		o specific disciplines. HISTORY 1100 or HISTORY 1200* or PHILOS 1105 or PHILOS 1115 or POL SCI 1200* or PSYCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Early Western Civilization or Modern Western Civilization* or Self and World: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government*or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	6
		Humanities		ocial Sciences		
HASS Elective	Humanities, Arts, Social Sciences Elective: Any histo music, theater, English and technical communication, philosophy, political science, psychology, economics, etymology, or foreign language.	ry, art, 3	Select 3 hou	rs. HASS Elective	Humanities, Arts, Social Sciences Elective: Any history, art, music, theater, English and technical communication, philosophy, political science, psychology, economics, etymology, or foreign language.	3
	No free electives applied to the degree.	0			Maximum Free Electives	0
	Group 2 Major Requirements Group 1 Core Requirements T	37 32 otal Hours 69			Group 2 Major Requirements Group 1 Core Requirements Total Hours* *S&T advisor permission is required to transfer more than 65 credits toward the S&T Geological Engineering degree.	37 30 67

	Mechanical En	gineerin	g Grou	ıp 2 Major R	equirements	
	Morehouse College		Semester		Missouri S&T	
ENG 102 or ENG 393 or COM 253	English Composition or Business and Professional Writing or Public Speaking	3		ENGLISH 1160 or ENGLISH 3560 or SPMS 1185	Writing and Research or Technical Writing or Principles of Speech Applies to degree as Gen Ed Communication requirement.	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab	4		CHEM 1310*, 1319	General Chemistry I* and Lab *CHEM 1310 will be substituted for CHEM 1305.	5
CSC 110 or CSC 160	Computer Programming I or Computer Programming II	3		COMP SCI 1971, 1981	Intro to Programming Method and Lab (C++)	3
EGR 205 EGR 206	Engineering Statics	3		CIV ENG 2200 CIV ENG 2210	Engineering Mechanics-Statics	3
MTH 271 or MTH 341	Mechanics of Materials Intro to Linear Algebra or Probability and Statistics I	3		MATH 3108 or STAT 3115	Mechanics of Materials Linear Algebra I or Engineering Statistics Satisfies the Advanced Math/Statistics elective requirement.	3
	Humanities	. Arts. and Socia	l Sciences Ge	eneral Education Requir		
	6 hours H	Humanities and Finehavioral and Socie STORY 1200, 130	e Arts from at le al Sciences fron 0, 1310, or POL		and lines.	
			nanities and F om at least two	ine Arts o specific disciplines.		
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature II or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music *Satisfies the State of Missouri government requirement.	6		ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or HISTORY 1300* or HISTORY 1310* or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1600 to 1865 or American Literature: 1600 to 1865 or American Literature: 1865 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation 'Satisfies the State of Missouri government requirement.	6
			oral and Socia			
HIS 111 or HIS 112* or PHI 201 or PHI 301 or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	Select 6 hours fr	om at least two	o specific disciplines. HISTORY 1100 or HISTORY 1200* or PHILOS 1105 or PHILOS 1115 or POL SCI 1200* or PSYCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Early Western Civilization or Modern Western Civilization* or Self and World: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government*or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	6
		Humanitie	s, Arts, and Se Select 3 hou	ocial Sciences		
HASS Elective	Humanities, Arts, Social Sciences Elective: Any hi music, theater, English and technical communicatic philosophy, political science, psychology, economic etymology, or foreign language.	on,	33.331 0 11341	HASS Elective	Humanities, Arts, Social Sciences Elective: Any history, art, music, theater, English and technical communication, philosophy, political science, psychology, economics, etymology, or foreign language.	3
	No free electives applied to the degree. Group 2 Major Requirements Group 1 Core Requirements	0 34 32 Total Hours 66			Maximum Free Electives Group 2 Major Requirements Group 1 Core Requirements Total Hours* *S&T advisor permission is required to transfer more than 68 credits toward the S&T Mechanical Engineering degree.	0 35 30 65

	Morehouse College	So	mester	Missouri S&T	
ENG 102 or ENG 393 or	English Composition or Business and Professional Writing or	3	ENGLISH 1160 or ENGLISH 3560 or	Writing and Research or Technical Writing or Principles of Speech	3
COM 253	Public Speaking	•	SPMS 1185	Applies to degree as Gen Ed Communication requirement.	
ИТН 341	Probability and Statistics I	3	STAT 3115	Engineering Statistics	3
GR 205	Engineering Statics	3	CIV ENG 2200	Engineering Mechanics-Statics	3
EGR 206	Mechanics of Materials	3	CIV ENG 2210	Mechanics of Materials	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab	4	CHEM 1310, 1319	General Chemistry I and Lab General Chemistry II (3) and Qualitative Analysis (2)	
CHE 112	Elementary Inorganic Chemistry II	3	CHEM 1320, 1510*	*CHEM 1510 is not a degree requirement, transfers as general elective credit.	3
CHE 231, 231L or CHE 321 or PHY 254	Elementary Organic Chemistry I (3) and Lab* (1) or Elementary Physical Chemistry (3) or Optics and Modern Physics (3)		CHEM 2210, 2219* or CHEM 3410 or PHYSICS 2305	Organic Chemistry I (3) and Lab* (1) or Chemical Thermodynamics I (3) or Intro to Modern Physics (3) Not specifically required for the degree but will satisfy out-of-department technical elective requirement. *ChIEM 2219 is not a Missouri S&T degree requirement, will transfer as general elective credit.	3
	Humanities, Arts,	and Social Scie	nces General Education Requir	ements	
	6 hours Human	ities and Fine Arts al and Social Scier	group below, select 15 hours to incl from at least two specific disciplines nees from at least two specific discip t, or POL SCI 1200 to satisfy the S	and lines.	
		Humanitie	s and Fine Arts		
	Selec	t 6 hours from at	east two specific disciplines.		
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature I or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music *Satisfies the State of Missouri government requirement.	6	ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or HISTORY 1300* or HISTORY 1310* or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1600 to 1865 or American Literature: 1865 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation *Satisfies the State of Missouri government requirement.	6
		Behavioral ar	nd Social Sciences		
	Selec	t 6 hours from at	east two specific disciplines.		
HIS 111 or HIS 112* or PHI 201 or PHI 301 or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	6	HISTORY 1100 or HISTORY 1200* or PHILOS 1105 or PHILOS 1115 or POL SCI 1200* or PSVCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Early Western Civilization or Modern Western Civilization* or Self and World: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government*or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	6
			, and Social Sciences et 3 hours.		
HASS Elective	Humanities, Arts, Social Sciences Elective: Any history, a music, theater, English and technical communication, philosophy, political science, psychology, economics, etymology, or foreign language.		HASS Elective	Humanities, Arts, Social Sciences Elective: Any history, art, music, theater, English and technical communication, philosophy, political science, psychology, economics, etymology, or foreign language.	3
	Maximum Free Electives	3		Maximum Free Electives	3
	Group 2 Major Requirements	37		Group 2 Major Requirements	4
	Group 1 Core Requirements	32		Group 1 Core Requirements	3
	Total	Hours 69		Total Hours* *S&T advisor permission is required to transfer more than 68 credits toward the S&T Metallurgical Engineering degree.	7

	Mining Engine	ering G	Group 2 Major Re	quirements	
	Morehouse College		Semester	Missouri S&T	
ENG 102 or ENG 393 or COM 253	English Composition or Business and Professional Writing or Public Speaking	3	ENGLISH 1160 or ENGLISH 3560 or SPMS 1185	Writing and Research or Technical Writing or Principles of Speech Applies to degree as Gen Ed Communication requirement.	3
MTH 341 CHE 111, 111L	Probability and Statistics I Elementary Inorganic Chemistry I and Lab	3 4	STAT 3115 CHEM 1310, 1319	Engineering Statistics General Chemistry I and Lab	3 5
EGR 205	Engineering Statics	3	CIV ENG 2200	Engineering Mechanics-Statics	3
EGR 208	Engineering Dynamics	3	MECH ENG 2350	Engineering Mechanics-Dynamics	2
EGR 206	Mechanics of Materials	3	CIV ENG 2210	Mechanics of Materials	3
	Humanities, Ar	ts, and Social	Sciences General Education Requ		
	6 hours Hum	vioral and Fine of the series		es and ciplines.	
			nities and Fine Arts		
		lect 6 hours fron	n at least two specific disciplines.		
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature I or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music "statisfies the State of Missouri government requirement.	6	ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or HISTORY 1300* or HISTORY 1310* or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1800 to 1865 or American Literature: 1865 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation 'Satisfies the State of Missouri government requirement.	6
			al and Social Sciences		
		lect 6 hours fron	n at least two specific disciplines.		
HIS 111 or HIS 112* or PHI 201 or PHI 301 or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	6	HISTORY 1100 or HISTORY 1200* or PHILOS 1105 or PHILOS 1115 or POL SCI 1200* or PSYCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Early Western Civilization or Modern Western Civilization* or Self and World: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government*or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	6
	No free electives applied to the degree.	0		Maximum Free Electives	0
	Group 2 Major Requirements Group 1 Core Requirements	31 32 otal Hours 63		Group 2 Major Requirements Group 1 Core Requirements Total H *S&T advisor permission is required to transfer more than 68 credits toward the S&T Mining Engineering degree.	31 30 ours* 61

	Nuclear Engine					
	Morehouse College		Semester		Missouri S&T	
ENG 102 or ENG 393 or COM 253	English Composition or Business and Professional Writing or Public Speaking	3		ENGLISH 1160 or ENGLISH 3560 or SPMS 1185	Writing and Research or Technical Writing or Principles of Speech Applies to degree as Gen Ed Communication requirement.	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab	4		CHEM 1310, 1319	General Chemistry I and Lab	5
CSC 110 or CSC 160	Computer Programming I or Computer Programming II	3		COMP SCI 1971, 1981	Intro to Programming Method and Lab (C++)	3
MTH 271 or MTH 255	Intro to Linear Algebra or Intro to Set Theory	3		MATH 3108 or MATH 3109	Linear Algebra or Foundations of Mathematics	3
EGR 205	Engineering Statics	3		CIV ENG 2200	Engineering Mechanics-Statics	3
EGR 206	Mechanics of Materials	3		CIV ENG 2210	Mechanics of Materials	3
MTH 341	Probability and Statistics I	3		STAT 3115	Engineering Statistics	3
PHY 254	Optics and Modern Physics	3		PHYSICS 2305 or PHYSICS 2311	Intro to Modern Physics or Modern Physics	3
	Humanities Arts	and Social	Sciences Go	eneral Education Require		
	From the opt 6 hours Huma	ions listed in e nities and Fine oral and Social	each group be Arts from at le Sciences from	elow, select 15 hours to incluse ast two specific disciplines and tleast two specific disciplines.	ude and ines.	
	At least one course must be selected from his for		anities and F		ate of Missouri government requirement.	
	Sele			specific disciplines.		
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature I or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music 'Satisfies the State of Missouri government requirement.	6		ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or HISTORY 1300° or HISTORY 1310° or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1600 to 1865 or American Literature: 1865 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation **Satisfies the State of Missouri government requirement.	6
			ral and Socia			
ECO 202 or		ct 6 hours fro	m at least two	specific disciplines. ECON 1100 or	Principles of Microeconomics or	
ECO 202 of ECO 201	Principles of Microeconomics or Principles of Macroeconomics	3		ECON 1200	Principles of Microeconomics Principles of Macroeconomics	3
HIS 111 or HIS 112* or PHI 201 or PHI 301 or PSC 251* or PSY 101 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Elementary or Intermediate Foreign Language "Satisfies the State of Missouri government requirement.	3		HISTORY 1100 or HISTORY 1200° or PHILOS 1105 or PHILOS 1115 or POL SCI 1200° or PSYCH 1101 or Foreign Language	Early Western Civilization or Modern Western Civilization* or Self and World: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government*or General Psychology or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.	3
			, Arts, and So Select 3 hour	ocial Sciences		
HASS Elective	Humanities, Arts, Social Sciences Elective: Any history, music, theater, English and technical communication, philosophy, political science, psychology, economics, etymology, or foreign language.			HASS Elective	Humanities, Arts, Social Sciences Elective: Any history, art, music, theater, English and technical communication, philosophy, political science, psychology, economics, etymology, or foreign language.	3
	Maximum Free Electives	0			Maximum Free Electives	0
	Group 2 Major Requirements	40			Group 2 Major Requirements	41
	Group 1 Core Requirements	32			Group 1 Core Requirements	30
	Tota	al Hours 72			Total Hours* *S&T advisor permission is required to transfer more than 69 credits toward the S&T Nuclear Engineering degree.	71

	Petroleum Eng	gineeri	ng G	Froup 2 Major Re	equirements	
	Morehouse College		Se	mester	Missouri S&T	
ENG 102 or ENG 393 or COM 253	English Composition or Business and Professional Writing or Public Speaking		3	ENGLISH 1160 or ENGLISH 3560 or SPMS 1185	Writing and Research or Technical Writing or Principles of Speech Applies to degree as Gen Ed Communication requirement.	3
CHE 111, 111L	Elementary Inorganic Chemistry I and Lab		4	CHEM 1310, 1319	General Chemistry I and Lab	5
EGR 205	Engineering Statics		3	CIV ENG 2200	Engineering Mechanics-Statics	3
EGR 208	Engineering Dynamics		3	MECH ENG 2350	Engineering Mechanics-Dynamics	2
EGR 206	Mechanics of Materials		3	CIV ENG 2210	Mechanics of Materials	3
	From the	e options listed lumanities and chavioral and S	d in each Fine Arts locial Scie	group below, select 15 hours to incl from at least two specific disciplines nees from at least two specific disciplines or POL SCI 1200 to satisfy the S	lude and lines.	
	At least one course must be selected from his			es and Fine Arts	tate of Missouri government requirement.	
				least two specific disciplines.		
ENG 271 or ENG 272 or ENG 363 or ENG 364 or ENG 250 or HIS 215* or HIS 216* or ART 110 or MUS 111	Survey of English Literature I or Survey of English Literature II or Survey of American Literature I or Survey of American Literature II or World Literature or History of the United States to 1876* or History of the United States Since 1876* or Survey of Visual Arts or Masterpieces of Music *Satisfies the State of Missouri government requirement.		6	ENGLISH 1211 or ENGLISH 1212 or ENGLISH 1221 or ENGLISH 1222 or ENGLISH 1231 or HISTORY 1300* or HISTORY 1310* or ART 1180 or MUSIC 1150 0	British Literature I: The Beginnings to 1800 or British Literature II: 1800 to Present American Literature: 1600 to 1865 or American Literature: 1865 to Present or World Literature: 1865 to Present or World Literature I: Beginnings to the Renaissance or American History to 1877* or American History Since 1877* or Art Appreciation or Music Understanding and Appreciation *Satisfies the State of Missouri government requirement.	6
				nd Social Sciences		
		Select 6 hour	s from at	least two specific disciplines.		
HIS 111 or HIS 112* or PHI 201 or PHI 301 or PSC 251* or PSY 101 or ECO 202 or ECO 201 or Foreign Language	World History: Topical Approaches or World History: Topical Approaches* or Intro to Philosophy or Formal Logic or National Government* or Intro to Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language *Satisfies the State of Missouri government requirement.		6	HISTORY 1100 or HISTORY 1200* or PHILOS 1105 or PHILOS 1115 or POL SCI 1200* or PSYCH 1101 or ECON 1100 or ECON 1200 or Foreign Language	Early Western Civilization or Modern Western Civilization* or Self and World: Intro to Philosophy or Logic and Reasoning: An Introduction or American Government*or General Psychology or Principles of Microeconomics or Principles of Macroeconomics or Elementary or Intermediate Foreign Language "Satisfies the State of Missouri government requirement.	6
		Humani		s, and Social Sciences ct 3 hours.		
HASS Elective	Humanities, Arts, Social Sciences Elective: Any hi music, theater, English and technical communicatic philosophy, political science, psychology, economic etymology, or foreign language.	on,	3	HASS Elective	Humanities, Arts, Social Sciences Elective: Any history, art, music, theater, English and technical communication, philosophy, political science, psychology, economics, etymology, or foreign language.	3
	No free electives applied to the degree.		0		Maximum Free Electives	0
	Group 2 Major Requirements Group 1 Core Requirements	Total Hours	31 32 63		Group 2 Major Requirements Group 1 Core Requirements Total Hours* *S&T advisor permission is required to transfer more than 69 credits toward the S&T Petroleum Engineering degree.	31 30 61