# College of Engineering Department of Mining and Minerals Engineering Degree: Bachelor of Science in Mining Engineering

Major: Mining Engineering For students entering UG Catalog 2023-2024 Credits Required for Graduation: 128

CHEM 1035 General Chemistry Pre: Eligible to enroll  CHEM 1045 General Chemistry Pre: Eligible to enroll  CHEM 1045 General Chemistry Lab' Co. CHEM 1035  ENGL 1106 First-Year Writing Pre: MATH 1225  ENGL 1105 First-Year Writing Pre: MATH 1225  AMTH 1226 Calculus of a Single Variable Pre: MATH 1225  BMATH 1226 Calculus of a Single Variable Pre: MATH 1225  AMTH 1226 Calculus of a Single Variable Pre: MATH 1225  BMATH 1226 Calculus of a Single Variable Pre: MATH 1225  BMATH 1226 Calculus of a Single Variable Pre: MATH 1225  BMATH 1226 Calculus of a Single Variable Pre: MATH 1225  BMATH 1226 Calculus of a Single Variable Pre: MATH 1225  BMATH 1226 Calculus of a Single Variable Pre: MATH 1225  BMATH 1226 Calculus of a Single Variable Pre: MATH 1225  BMATH 2216 Calculus of a Single Variable Pre: MATH 1225  BMATH 2216 Calculus of a Single Variable Pre: MATH 1226 or MATH			Graduation: 128				
MATH 1226 Calculus of a Single Variable? Pre: MATH 1225   4		FALL SEMESTER FIRST YEAR	Credits		SPRING SEMESTER FIRST YEAR	Credits	
MATH 1215 Calculus of a Single Variable <sup>2</sup> (C-) Prec-Eligible to coroll	CH	IEM 1035 General Chemistry <sup>2</sup> Pre: Eligible to enroll	3		ENGL 1106 First-Year Writing <sup>2</sup> Pre: ENGL 1105	3	
MATH 1225 Calculus of a Single Variable* (C-) Pre: Eligible to enough   MATH 1225 Calculus of a Single Variable* (C-) Pre: Eligible to enough   MATH 1225 Calculus of a Single Variable* (C-) Pre: Eligible to enough   Pathways Concept 12* (7)*   3	CH	IEM 1045 General Chemistry Lab <sup>2</sup> Co: CHEM 1035	1		MATH 1226 Calculus of a Single Variable <sup>2</sup> Pre: MATH 1225	4	
EMGE 1215 Foundations of Engineering? 2 Pathways Concept 2² (7)* 3 TOTAL 16  FAL SEMESTER SECOND YEAR OPERS GEOS 1004 Introduction to Earth Science 3 GEOS 1104 Intro to Earth Science 3 GEOS 1104 Intro to Earth Science 4 GEOS 1104 Intro to Earth Science 4 GEOS 1104 Intro to Earth Science 4 MATH 2204 Intro to Multivariable Calculus** Pre: MATH 1226 MATH 2204 Intro to Multivariable Calculus** Pre: MATH 1226 MATH 2204 Intro to Multivariable Calculus** Pre: MATH 1226 MATH 2204 Intro to Multivariable Calculus** Pre: MATH 1226 MATH 2204 Intro to Multivariable Calculus** Pre: MATH 1226 MATH 2204 Intro to Multivariable Calculus** Pre: MATH 1226 MATH 2204 Intro to Multivariable Calculus** Pre: MATH 1226 MATH 2204 Intro to Mining Engineering* 3 MINE 2504 Intro to Mining Geomechanics* Pre: 2504, ESM 2204, ESM 2204	EN	IGL 1105 First-Year Writing <sup>2</sup>	3		1	3	
Pathways Concept 2² (?)*  TOTAL 16  FALL SEMESTER SECOND YEAR  GEOS 1004 Introduction to Earth Science  3 SEM 2204 Mechanics of Deformable Bodies Pre: (ESM 2104 or SM 2114), (MATH 2204 or MATH 2204 or	enr	roll	4		1225) or (MATH 1206 or MATH 1206H or 1226)	4	
FALL SEMESTER SECOND YEAR  GEOS 1004 Introduction to Earth Science  3			2			2	
FALL SEMESTER SECOND YEAR  GEOS 1004 Introduction to Earth Science  3	Pa	thways Concept 2 <sup>2</sup> (7)*	3		Pathways Concept 2 <sup>2</sup> (7)*	3	
GEOS 1004 Introduction to Earth Science  GEOS 1104 Intro to Earth Science  GEOS 1104 Intro to Earth Sciences Lab  1 1	$\bot$	TOTAL	16		TOTAL	19	
GEOS 1104 Intro to Earth Sciences Lab  1 ESM 2104 Dynamics <i>Pre: MATH 2204</i> or <i>AMTH 2204</i> or <i>A</i>		FALL SEMESTER SECOND YEAR	Credits		SPRING SEMESTER SECOND YEAR	Credits	
MATH 2204 Intro to Multivariable Calculus** Pre: MATH 1226  MATH 2214 Introduction to Differential Equations** Pre: MATH 1216 MATH 2214 or MATH 2114	GE	OS 1004 Introduction to Earth Science	3			3	
ESM 2104 Statics Pre: MATH 2206 co: MATH 2204 or MATH 2206 or MATH 2204 or MATH 2204 or MATH 2206 or MATH 2206 or MATH 2204 or MATH 2206 or MATH 2206 or MATH 2206 or MATH 2204 or MATH 2206 or MATH 2207 or MATH 2206 or MATH 2206 or MATH 2207 or MATH 2207 or MATH 2207 or MATH 2208 or MATH 220	GE	OS 1104 Intro to Earth Sciences Lab	1		MATH 2204H); Co: MATH 2214	3	
MINE 2504 Intro to Mining Engineering 3 3 [6,5]	M	ATH 2204 Intro to Multivariable Calculus <sup>~</sup> Pre: MATH 1226	3		Pre: (MATH 1114 or MATH 2114 or MATH 2114H or MATH 2405H or ISC 2105), MATH	3	
MINE 2534 Mine Surveying and Mapping Pre: MATH 1226  MINE 3604 Mining Geomechanics Pre: 2504, ESM 2204, GEOS 1004  MINE 3604 Mining Geomechanics Pre: 2504, ESM 2204, GEOS 1004  MINE 3604 Mining Geomechanics Pre: 2504, ESM 2204, GEOS 1004  MINE 3604 Mining Geomechanics Pre: 2504, ESM 2204, GEOS 1004  MINE 3604 Mining Geomechanics Pre: 2504, ESM 2204, GEOS 1004  MINE 3604 Mining Geomechanics Pre: 2504, ESM 2204, GEOS 1004  MINE 3604 Mining Geomechanics Pre: 2504, ESM 2204, GEOS 1004  MINE 3604 Mining Geomechanics Pre: 2504, ESM 2204, GEOS 1004  MINE 3604 Mining Geomechanics Pre: 2504, GEOS 1004  MINE 3604 Mine and Quarry Design Pre: 2504, 3604  MINE 3604 Mining Geomechanics Pre: 3604  MINE 3604 Mining Geomechanics Pre: 3604  MINE 3604 Mine Geomechanics Pre: 3604  MINE 3604 Mining Geomechanics Pre: 3604  MINE 3604 Mining Engineering Capstone Pre: 2504  MINE 3604 Mining Engineering Capstone Pre: 2604, 3604  MINE 3604 Mining Engineering Capstone Pre: 2604  MINE 3605			3			<b>2</b> <sup>[S]</sup>	
TOTAL 16  FALL SEMESTER THIRD YEAR  Credits  SPRING SEMESTER THIRD YEAR  Credits  GEOS 3404 Elements of Structural Geology Pre: (GEOS 1004 or GEOS 2104), (PHYR 2305 or PHYS 2205), (CHEM 1035 or CHEM 1015), (MATH 1225 or MATH 1025)  MINE 3624 Mineral Resource Project Management Pre: 2504, (HEM 1035 or CHEM 1015), (MATH 1225 or MATH 1025)  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, (HEM 1035), GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, (HEM 1035), GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, (HEM 1035), GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, 3[r]  MINE 3644 Applications in Mineral Processing Pre: 2564, 3604  MINE 3654 Underground Mine Design Pre: 2564, 3604  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, 3[r]  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, 3[r]  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, 3[r]  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, 3[r]  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, 3[r]  MINE 3684 Ventilation Engineering Pre: 2504  MINE 4614 Health and Safety Systems Pre: (3564 or 3574)  MINE 4614 Health and Safety Systems Pre: (3564 or 3574)  MINE 4635 Mining Engineering Capstone Pre: 2544, (3564 or 3574)  MINE 4636 Mining Engineering Capstone Pre: 4635  MINE 4636 Mining Engineering	MI	NE 2504 Intro to Mining Engineering <sup>1</sup>	Ŭ		GEOS 2504	<b>3</b> <sup>[S]</sup>	
FALL SEMESTER THIRD YEAR  Credits  MINE 3604 Mining Geomechanics¹ Pre: 2504, ESM 2204, GEOS 1004  MINE 3624 Mineral Resource Project Management¹ Pre: 31F1  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, ESM 2204, GEOS 31F1  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, CHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, CHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, CHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, CHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, GHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, GHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, GHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, 3674  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, 3674  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, 3674  MINE 364 Fluids and Thermodynamics for Resources Pre: BM 2304, MATH 2214  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, 3674  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, 3674  MINE 3684 Ventilation Engineering Pre: 2504  MINE 4614 Health and Safety Systems¹ Pre: (3564 or 3574)  MINE 4614 Health and Safety Systems¹ Pre: (3564 or 3574)  MINE 4635 Mining Engineering Capstone² Pre: 2544, (3564 or 3574)  MINE 4636 Mining Engineering Capstone² Pre: 3664, 3674  MINE 4636 Mining Engineering Capstone² Pre: 3664, 3674  MINE 4636 Mining Engineering Capstone² Pre: 3664  MINE 4636 Mining Engineering Capstone² Pre: 36	MI	INE 2534 Mine Surveying and Mapping Pre: MATH 1226	3 <sup>[F]</sup>			+	
MINE 3604 Mining Geomechanics¹ Pre: 2504, ESM 2204, GEOS 1004 or GEOS 2024 or GEOS 2104)—OR—GEOS 4824 Engineering Geology Pre: (GEOS 1004 or GEOS 2024 or GEOS 2104), (PHYS 2305 or PHYS 2205), (CHEM 1035 or CHEM 1025) (MINE 3634 Fundamentals of Mineral Processing Pre: 2504, CHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, GHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, GHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, GHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, GHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, GHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, GHEM 1035, GEOS 1004  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, 3[F]  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, 3[F]  MINE 3644 Elements of Structural Geology Pre: (GEOS 1004 or GEOS 2104), [PHYS 2305 or PHYS 2205], (CHEM 1035 or CHEM 1025) (CHEM 1035 or CHEM 1025), (MATH 1225 or MATH 2214  MINE 3644 Elements of Structural Geology Pre: (GEOS 1004 or GEOS 2104), [PHYS 2305 or PHYS 2205], (CHEM 1035 or CHEM 1025), (MATH 2225 or MATH 1025)  MINE 3644 Applications in Mineral Processing Pre: 2564, 3604  MINE 3644 Elements of Structural Geology Pre: (GEOS 1004 or GEOS 2104)  MINE 3644 Applications in Mineral Processing Pre: 2564, 3604  MINE 3644 Applications in Mineral Processing Pre: 2564, 3604  MINE 3644 Applications in Mineral Processing Pre: 2564, 3604  MINE 3644 Applications in Mineral Processing Pre: 2564, 3604  MINE 3644 Applications in Mineral Processing Pre: 2564, 3604  MINE 3644 Applications in Mineral Processing Pre: 2564, 3604  MINE 3644 Environmental Management for Mining and GEOS 2024)  MINE 3654 Underground Mine Design¹ Pre: 2564, 3604  MINE 3654 Underground Mine Design¹ Pre: 2564, 3604  MINE 3664 Fluids and Themodynamics for Resources Pre: 2504, 3604  MINE 3664 Fluids and Quarry Design¹ Pre: 256	$\perp$	TOTAL	16		TOTAL	. 17	
MINE 3604 Mining Geomechanics <sup>1</sup> Pre: 2504, ESM 2204, GEOS 1004  MINE 3624 Mineral Resource Project Management <sup>1</sup> Pre: 2504, 2564  MINE 3634 Fundamentals of Mineral Processing Pre: 2504, CHEM 1035, GEOS 1004  MINE 3644 Fundamentals of Mineral Processing Pre: 2504, CHEM 1035, GEOS 1004  MINE 3664 Fluids and Thermodynamics for Resources Pre: 2504, MINE 3664 Fluids and Thermodynamics for Resources Pre: 2504, MINE 3674 Explosives and Rock Fragmentation Pre: 2504, GEOS 1004, ESM 2204  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, GEOS 1004, ESM 2204  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, GEOS 1004, ESM 2204  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, GEOS 1004, ESM 2204  TOTAL 15  TOTAL 15  FALL SEMESTER FOURTH YEAR  MINE 4614 Health and Safety Systems Pre: (3564 or 3574)  MINE 4635 Mining Engineering Capstone Pre: 2504, (3564 or 3574)  MINE 4636 Mine and Reservoir Water Engineering Pre: 3664, (3564 or 3574)  MINE 4654 Mine Power Systems and Automation Pre: MATH 2214  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  Technical Elective  3 F   GEOS 2024 or GEOS 2104 or GEOS 2104 or GEOS 2104 or GEOS 2104 or GEOS 2104, DINE 2504, MINE 3644 Applications in Mineral Processing Pre: 3664, GEOS 4024 Mineral Deposits Pre: (GEOS 1004 or GEOS 2104 or GE	$\top$	FALL SEMESTER THIRD YEAR	Credits		SPRING SEMESTER THIRD YEAR	Credits	
MINE 3624 Mineral Resource Project Management <sup>1</sup> Pre: 2504, 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2564. 2565. 2564. 2565. 2564. 2565. 2564. 2565. 2564. 2565. 2564. 2565. 2564. 2565. 2564. 2565. 2564. 2565. 2564. 2565. 2564. 2565. 2565. 2564. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565. 2565.			3 <sup>[F]</sup>		GEOS 2024 or GEOS 2104)— <b>OR</b> —GEOS 4824 Engineering Geology <i>Pre:</i> (GEOS 1004 or GEOS 2024 or GEOS 2104), (PHYS 2305 or	3	
MINE 3664 Fluids and Thermodynamics for Resources Pre: ESM 2304, MATH 2214  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, GEOS 1004, ESM 2204  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, GEOS 1004, ESM 2204  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, GEOS 1004, ESM 2204  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, GEOS 1004, ESM 2204  MINE 3674 Explosives and Rock Fragmentation Pre: 2504, GEOS 1004, ESM 2204  MINE 4614 Health and Safety Systems Pre: (3564 or 3574)  MINE 4614 Health and Safety Systems Pre: (3564 or 3574)  MINE 4635 Mining Engineering Capstone Pre: 2544, (3564 or 3574), 3624  MINE 4624 Mine and Reservoir Water Engineering Pre: 3664, (3564 or 3574)  MINE 4654 Mine Power Systems and Automation Pre: MATH 2214  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  Technical Elective  3 IFI  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  Technical Elective  3 IFI  Pathways Concept 32 (7)*  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  Technical Elective  3 IFI  Pathways Concept 32 (7)*			3 <sup>[F]</sup>			<b>2</b> <sup>[S]</sup>	
MINE 3674 Explosives and Rock Fragmentation Pre: 2504, GEOS 1004, ESM 2204  TOTAL  FALL SEMESTER FOURTH YEAR  MINE 4614 Health and Safety Systems <sup>1</sup> Pre: (3564 or 3574)  MINE 4635 Mining Engineering Capstone <sup>2</sup> Pre: 2544, (3564 or 3574), 3624  MINE 4624 Mine and Reservoir Water Engineering Pre: 3664, (3564 or 3574)  MINE 4634 Mine Power Systems and Automation Pre: MATH 2214  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  Technical Elective  MINE 3584 Ventilation Engineering Pre: 2504  3[F]  MINE 3584 Ventilation Engineering Pre: 2504  3[S]  Pathways Concept 6a2 (7)*  SPRING SEMESTER FOURTH YEAR  Credits  MINE 4634 Mineral Deposits Pre: (GEOS 1004 or GEOS 2104 or GEOS 2024)  MINE 4636 Mining Engineering Capstone <sup>2</sup> Pre: 4635  2[S]  MINE 4636 Mining Engineering Capstone <sup>2</sup> Pre: 4635  MINE 4644 Environmental Management for Mining and Geoenergy <sup>1</sup> Pre: (3564 or 3574)  Technical Elective  3  Technical Elective  3  Technical Elective  3  Technical Elective  3  Technical Elective		INE 3634 Fundamentals of Mineral Processing Pre: 2504,					
FALL SEMESTER FOURTH YEAR  TOTAL  FALL SEMESTER FOURTH YEAR  MINE 4614 Health and Safety Systems¹ Pre: (3564 or 3574)  MINE 4635 Mining Engineering Capstone² Pre: 2544, (3564 or 3574)  MINE 4624 Mine and Reservoir Water Engineering Pre: 3664, (3564 or 3574)  MINE 4654 Mine Power Systems and Automation Pre: MATH 2214  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  Technical Elective  Pathways Concept 6a2 (7)*  Pathways Concept 6a2 (7)*  SPRING SEMESTER FOURTH YEAR  Credits  SPRING SEMESTER FOURTH YEAR  Credits  SPRING SEMESTER FOURTH YEAR  Credits  SERIOS 4624 Mineral Deposits Pre: (GEOS 1004 or GEOS 2104 or GEOS 2024)  MINE 4636 Mining Engineering Capstone² Pre: 4635  2[5]  MINE 4636 Mining Engineering Capstone² Pre: 4635  3[6]  MINE 4644 Environmental Management for Mining and Geoenergy¹ Pre: (3564 or 3574)  Technical Elective  3  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  Technical Elective  3  Pathways Concept 3² (7)*  Pathways Concept 3² (7)*	LCH.	EM 1035, GEOS 1004	3 <sup>[F]</sup>		MINE 3564 Underground Mine Design <sup>1</sup> Pre: 2564, 3604	<b>3</b> <sup>[S]</sup>	
TOTAL 15  FALL SEMESTER FOURTH YEAR  Credits  MINE 4614 Health and Safety Systems¹ Pre: (3564 or 3574)  MINE 4635 Mining Engineering Capstone² Pre: 2544, (3564 or 3574), 3624  MINE 4624 Mine and Reservoir Water Engineering Pre: 3664, (3564 or 3574)  MINE 4654 Mine Power Systems and Automation Pre: MATH 2214  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  Technical Elective  TOTAL 17  SPRING SEMESTER FOURTH YEAR  Credits  SEPSING SEMESTER FOURTH YEAR  Credits  MINE 4636 Mineral Deposits Pre: (GEOS 1004 or GEOS 2104 or GEOS 2104 or GEOS 2024)  MINE 4636 Mining Engineering Capstone² Pre: 4635  MINE 4636 Mining Engineering Capstone² Pre: 4635  MINE 4644 Environmental Management for Mining and Geoenergy¹ Pre: (3564 or 3574)  Technical Elective  3  Pathways Concept 3² (7)*  3  Technical Elective  3	MI	INE 3664 Fluids and Thermodynamics for Resources Pre:			MINE 3574 Surface Mine and Quarry Design <sup>1</sup> Pre: 2564, 3674	3 <sup>[S]</sup>	
FALL SEMESTER FOURTH YEAR  Credits  MINE 4614 Health and Safety Systems <sup>1</sup> Pre: (3564 or 3574)  MINE 4635 Mining Engineering Capstone <sup>2</sup> Pre: 2544, (3564 or 3574), 3624  MINE 4624 Mine and Reservoir Water Engineering Pre: 3664, (3564 or 3574)  MINE 4654 Mine Power Systems and Automation Pre: MATH 2214  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  Technical Elective  Credits  SPRING SEMESTER FOURTH YEAR  Credits  GEOS 4624 Mineral Deposits Pre: (GEOS 1004 or GEOS 2104 or GEOS 2104 or GEOS 2024)  MINE 4636 Mining Engineering Capstone <sup>2</sup> Pre: 4635  MINE 4636 Mining Engineering Capstone <sup>2</sup> Pre: 4635  Geoenergy <sup>1</sup> Pre: (3564 or 3574)  Technical Elective  3  Pathways Concept 3 <sup>2</sup> (7)*  3  Pathways Concept 3 <sup>2</sup> (7)*	MI ESM	INE 3664 Fluids and Thermodynamics for Resources <i>Pre:</i> M 2304, MATH 2214 INE 3674 Explosives and Rock Fragmentation <i>Pre: 2504</i> ,	3 <sup>[F]</sup>		MINE 3574 Surface Mine and Quarry Design <sup>1</sup> <i>Pre: 2564, 3674</i> MINE 3584 Ventilation Engineering <i>Pre: 2504</i>		
MINE 4614 Health and Safety Systems <sup>1</sup> Pre: (3564 or 3574)  MINE 4635 Mining Engineering Capstone <sup>2</sup> Pre: 2544, (3564 or 3574)  MINE 4624 Mine and Reservoir Water Engineering Pre: 3664, (3564 or 3574)  MINE 4654 Mine Power Systems and Automation Pre: MATH 2214  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  MINE 4614 Health and Safety Systems <sup>1</sup> Pre: (3564 or 3574)  3[F]  GEOS 4624 Mineral Deposits Pre: (GEOS 1004 or GEOS 2104 or GEOS 2104 or GEOS 22024)  MINE 4636 Mining Engineering Capstone <sup>2</sup> Pre: 4635  MINE 4636 Mining Engineering Capstone <sup>2</sup> Pre: 4635  MINE 4644 Environmental Management for Mining and Geoenergy <sup>1</sup> Pre: (3564 or 3574)  Technical Elective  3  Pathways Concept 3 <sup>2</sup> (7)*  3  Technical Elective  3	MI ESM	INE 3664 Fluids and Thermodynamics for Resources <i>Pre:</i> M 2304, MATH 2214 INE 3674 Explosives and Rock Fragmentation <i>Pre: 2504,</i> OS 1004, ESM 2204	3 <sup>[F]</sup>		MINE 3574 Surface Mine and Quarry Design <sup>1</sup> Pre: 2564, 3674  MINE 3584 Ventilation Engineering Pre: 2504  Pathways Concept 6a2 (7)*	3 <sup>[S]</sup> 3 <sup>[S]</sup>	
MINE 4635 Mining Engineering Capstone <sup>2</sup> Pre: 2544, (3564 or 3574), 3624  MINE 4624 Mine and Reservoir Water Engineering Pre: 3664, (3564 or 3574)  MINE 4654 Mine Power Systems and Automation Pre: MATH  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  Technical Elective  31  MINE 4636 Mining Engineering Capstone <sup>2</sup> Pre: 4635  2[S]  MINE 4636 Mining Engineering Capstone <sup>2</sup> Pre: 4635  2[S]  MINE 4636 Mining Engineering Capstone <sup>2</sup> Pre: 4635  2[S]  MINE 4644 Environmental Management for Mining and Geoenergy <sup>1</sup> Pre: (3564 or 3574)  Technical Elective  3  Pathways Concept 3 <sup>2</sup> (7)*  3  Technical Elective  3	MI ESM	INE 3664 Fluids and Thermodynamics for Resources <i>Pre:</i> M 2304, MATH 2214 INE 3674 Explosives and Rock Fragmentation <i>Pre: 2504,</i> OS 1004, ESM 2204	3 <sup>[F]</sup>		MINE 3574 Surface Mine and Quarry Design <sup>1</sup> Pre: 2564, 3674  MINE 3584 Ventilation Engineering Pre: 2504  Pathways Concept 6a2 (7)*	3 <sup>[S]</sup> 3 <sup>[S]</sup>	
MINE 4624 Mine and Reservoir Water Engineering Pre: 3664, (3564 or 3574)  MINE 4654 Mine Power Systems and Automation Pre: MATH  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  Technical Elective  2[5]  MINE 4644 Environmental Management for Mining and Geoenergy¹ Pre: (3564 or 3574)  Technical Elective  3  Pathways Concept 3² (7)*  3  Pathways Concept 3² (7)*	MI ESM	INE 3664 Fluids and Thermodynamics for Resources Pre: M 2304, MATH 2214 INE 3674 Explosives and Rock Fragmentation Pre: 2504, OS 1004, ESM 2204 TOTAL	3 <sup>[F]</sup>		MINE 3574 Surface Mine and Quarry Design <sup>1</sup> Pre: 2564, 3674  MINE 3584 Ventilation Engineering Pre: 2504  Pathways Concept 6a2 (7)*  TOTAL	3 <sup>[S]</sup> 3 <sup>[S]</sup>	
MINE 4624 Mine and Reservoir Water Engineering Pre: 3664, (3564 or 3574)  MINE 4654 Mine Power Systems and Automation Pre: MATH  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  Technical Elective  3[F]  MINE 4644 Environmental Management for Mining and Geoenergy¹ Pre: (3564 or 3574)  Technical Elective  3 Pathways Concept 3²(7)*  3[F] Pathways Concept 3²(7)*	MI ESN MI GE	INE 3664 Fluids and Thermodynamics for Resources Pre: M 2304, MATH 2214 INE 3674 Explosives and Rock Fragmentation Pre: 2504, OS 1004, ESM 2204  TOTAL  FALL SEMESTER FOURTH YEAR	3 <sup>[F]</sup> 3 <sup>[F]</sup> 15 Credits		MINE 3574 Surface Mine and Quarry Design <sup>1</sup> Pre: 2564, 3674  MINE 3584 Ventilation Engineering Pre: 2504  Pathways Concept 6a2 (7)*  TOTAL  SPRING SEMESTER FOURTH YEAR  GEOS 4624 Mineral Deposits Pre: (GEOS 1004 or GEOS 2104 or	3 <sup>[S]</sup> 3 <sup>[S]</sup> 3 17 Credits	
MINE 4654 Mine Power Systems and Automation Pre: MATH  2214  MINE 4664 Resource Engineering Leadership Seminar Pre: Senior Standing  Technical Elective  3  Pathways Concept 3 <sup>2</sup> (7)*  3  Technical Elective  3	MI ESN MI GEC	INE 3664 Fluids and Thermodynamics for Resources Pre: M 2304, MATH 2214 INE 3674 Explosives and Rock Fragmentation Pre: 2504, OS 1004, ESM 2204  TOTAL  FALL SEMESTER FOURTH YEAR INE 4614 Health and Safety Systems <sup>1</sup> Pre: (3564 or 3574) INE 4635 Mining Engineering Capstone <sup>2</sup> Pre: 2544, (3564 or	3 <sup>[F]</sup> 3 <sup>[F]</sup> 15 Credits		MINE 3574 Surface Mine and Quarry Design <sup>1</sup> Pre: 2564, 3674  MINE 3584 Ventilation Engineering Pre: 2504  Pathways Concept 6a2 (7)*  TOTAL  SPRING SEMESTER FOURTH YEAR  GEOS 4624 Mineral Deposits Pre: (GEOS 1004 or GEOS 2104 or GEOS 2024)	3 <sup>[S]</sup> 3 <sup>[S]</sup> 3 17 Credits	
Senior Standing Technical Elective 3	MI ESA MI GE	INE 3664 Fluids and Thermodynamics for Resources Pre: M 2304, MATH 2214 INE 3674 Explosives and Rock Fragmentation Pre: 2504, OS 1004, ESM 2204  TOTAL  FALL SEMESTER FOURTH YEAR INE 4614 Health and Safety Systems <sup>1</sup> Pre: (3564 or 3574) INE 4635 Mining Engineering Capstone <sup>2</sup> Pre: 2544, (3564 or 774), 3624 INE 4624 Mine and Reservoir Water Engineering Pre: 3664,	3 <sup>[F]</sup> 3 <sup>[F]</sup> 15 Credits 3 <sup>[F]</sup> 2 <sup>[F]</sup>		MINE 3574 Surface Mine and Quarry Design <sup>1</sup> Pre: 2564, 3674  MINE 3584 Ventilation Engineering Pre: 2504  Pathways Concept 6a2 (7)*  TOTAL  SPRING SEMESTER FOURTH YEAR  GEOS 4624 Mineral Deposits Pre: (GEOS 1004 or GEOS 2104 or GEOS 2024)  MINE 4636 Mining Engineering Capstone <sup>2</sup> Pre: 4635  MINE 4644 Environmental Management for Mining and	3 <sup>[S]</sup> 3 17 Credits	
	MI ESA MI GEC MI 357 MI (35	INE 3664 Fluids and Thermodynamics for Resources Pre: M 2304, MATH 2214 INE 3674 Explosives and Rock Fragmentation Pre: 2504, OS 1004, ESM 2204  TOTAL  FALL SEMESTER FOURTH YEAR INE 4614 Health and Safety Systems Pre: (3564 or 3574) INE 4635 Mining Engineering Capstone Pre: 2544, (3564 or 74), 3624 INE 4624 Mine and Reservoir Water Engineering Pre: 3664, 664 or 3574) INE 4654 Mine Power Systems and Automation Pre: MATH	3 <sup>[F]</sup> 3 <sup>[F]</sup> 15 Credits 3 <sup>[F]</sup> 2 <sup>[F]</sup>		MINE 3574 Surface Mine and Quarry Design <sup>1</sup> Pre: 2564, 3674  MINE 3584 Ventilation Engineering Pre: 2504  Pathways Concept 6a2 (7)*  TOTAL  SPRING SEMESTER FOURTH YEAR  GEOS 4624 Mineral Deposits Pre: (GEOS 1004 or GEOS 2104 or GEOS 2024)  MINE 4636 Mining Engineering Capstone <sup>2</sup> Pre: 4635  MINE 4644 Environmental Management for Mining and Geoenergy <sup>1</sup> Pre: (3564 or 3574)	3 <sup>[S]</sup> 3 <sup>[S]</sup> 3 17 Credits 3 2 <sup>[S]</sup>	
TOTAL 15	MI ESA MI GEE MI MI 353 MI (35 MI 223	INE 3664 Fluids and Thermodynamics for Resources Pre: M 2304, MATH 2214 INE 3674 Explosives and Rock Fragmentation Pre: 2504, OS 1004, ESM 2204  TOTAL  FALL SEMESTER FOURTH YEAR INE 4614 Health and Safety Systems Pre: (3564 or 3574) INE 4635 Mining Engineering Capstone Pre: 2544, (3564 or 74), 3624 INE 4624 Mine and Reservoir Water Engineering Pre: 3664, 1664 or 3574) INE 4654 Mine Power Systems and Automation Pre: MATH INE 4664 Resource Engineering Leadership Seminar Pre:	3 <sup>[F]</sup> 3 <sup>[F]</sup> 15 Credits 3 <sup>[F]</sup> 2 <sup>[F]</sup> 3 <sup>[F]</sup>		MINE 3574 Surface Mine and Quarry Design <sup>1</sup> Pre: 2564, 3674  MINE 3584 Ventilation Engineering Pre: 2504  Pathways Concept 6a2 (7)*  TOTAL  SPRING SEMESTER FOURTH YEAR  GEOS 4624 Mineral Deposits Pre: (GEOS 1004 or GEOS 2104 or GEOS 2024)  MINE 4636 Mining Engineering Capstone <sup>2</sup> Pre: 4635  MINE 4644 Environmental Management for Mining and Geoenergy <sup>1</sup> Pre: (3564 or 3574)  Technical Elective	3 <sup>[S]</sup> 3 <sup>[S]</sup> 3 17 Credits 3 2 <sup>[S]</sup> 2 <sup>[S]</sup>	
TOTAL 13	MI ESA MI GEG MI 352 MI (35 MI 222 MI Serv	INE 3664 Fluids and Thermodynamics for Resources Pre: M 2304, MATH 2214 INE 3674 Explosives and Rock Fragmentation Pre: 2504, OS 1004, ESM 2204  TOTAL  FALL SEMESTER FOURTH YEAR INE 4614 Health and Safety Systems Pre: (3564 or 3574) INE 4635 Mining Engineering Capstone Pre: 2544, (3564 or 74), 3624 INE 4624 Mine and Reservoir Water Engineering Pre: 3664, 1664 or 3574) INE 4654 Mine Power Systems and Automation Pre: MATH 14 INE 4664 Resource Engineering Leadership Seminar Pre: nior Standing	3 <sup>[F]</sup> 15  Credits  3 <sup>[F]</sup> 2 <sup>[F]</sup> 3 <sup>[F]</sup> 1 <sup>[F]</sup>		MINE 3574 Surface Mine and Quarry Design <sup>1</sup> Pre: 2564, 3674  MINE 3584 Ventilation Engineering Pre: 2504  Pathways Concept 6a2 (7)*  TOTAL  SPRING SEMESTER FOURTH YEAR  GEOS 4624 Mineral Deposits Pre: (GEOS 1004 or GEOS 2104 or GEOS 2024)  MINE 4636 Mining Engineering Capstone <sup>2</sup> Pre: 4635  MINE 4644 Environmental Management for Mining and Geoenergy <sup>1</sup> Pre: (3564 or 3574)  Technical Elective	3 <sup>[S]</sup> 3 <sup>[S]</sup> 3 17 Credits 3 2 <sup>[S]</sup> 2 <sup>[S]</sup>	

### COMMISSION ON UNDERGRADUATE STUDIES AND POLICIES

General Information about Checksheet: Course offerings are subject to change and the availability of sufficient resources. Students should confirm course offerings in advance with their department. <sup>1</sup>Superscript and green color indicates the course is a MINE core course for degree. <sup>2</sup>Superscript and beige color indicates the course is a Pathways Concept Course. Superscripted annotation (F, S, SI, SII) in credits column indicates terms when a course is expected to be offered.

#### **Pathways General Education (Pathways)**

Consult the pathways courses table: <a href="https://www.pathways.prov.vt.edu/students-and-advisors/pathways-guides.html">https://www.pathways.prov.vt.edu/students-and-advisors/pathways-guides.html</a>. Pathways courses need to be be completed prior to graduation

Pathways Concept 1:	Foundational: ENGL 1105	(3)	Foundational: ENGL 1106	(3)	
Discourse (6 hrs foundational, 3 hrs advanced)	Advanced: MINE 2544 + MINE 4635 + MINE 4636				
Pathways Concept 2: Critical Thinking in the Humanities (6 hrs)		(3)		(3)	
Pathways Concept 3: Reasoning in the Social Sciences (6 hrs)		(3)		(3)	
Pathways Concept 4: Reasoning in the Natural Sciences (8 hrs)	CHEM 1035 + 1045	(4)	PHYS 2305	(4)	
Pathways Concept 5:	Foundational: MATH 1225	(4)	Foundational: MATH 1226	(4)	
Quantitative and Computational Thinking (11 hrs)	Advanced: MATH 2214				
Pathways Concept 6:	Arts:				
Critique and Practice in Design and the Arts (7 hrs)	Design: ENGE 1215 + ENGE 1216				
Pathways Concept 7*:				(4)	
Critical Analysis of Identity & Equity in the US (3 hrs)					

\*Pathways 7 should be double counted with either Pathways 2, 3 or 6a to avoid taking any additional credit hours.

Change of Major Requirements: Please see https://eng.vt.edu/em.

**Foreign Language Requirements:** Students must have had 2 years of a foreign language in high school or one year at the college level (6 credit hours) of the same language. College-level credits used to meet this requirement do not count towards the degree.

Satisfactory Progress Towards Degree: Each student must meet the minimum University wide criteria as described for satisfactory progress and summarized in the Undergraduate Catalog (under Academic Policies -> University Policies Governing Enrollment -> Satisfactory Progress). After having completed 72 credit hours (including transfer, advanced placement, advanced standing, and credit by examination) a student must:

- Maintain an overall and in major GPA of 2.0 or better. (In-major GPA is calculated using all courses taken under the MINE designator)
- Have passing grades in MINE 2504, MATH 2204, and MATH 2214. Passing grade is anything higher than F.

**Statement of Hidden Prerequisites:** Prerequisites for each course are listed after the course title. The (letter grade) notation, such as (C-), indicates the minimum grade students must earn in the pre-requisite course. There are no hidden pre-requisites in the program of study. Prerequisites may change from what is indicated. Be sure to consult the University Catalog or check with your advisor for the most current pre-requisites.

**Graduation Requirements:** Each student must complete at least 128 semester credit hours with a minimum overall GPA of 2.00 and a minimum in-major GPA of 2.00. In-major GPA is determined from all courses with MINE designator.

~Additional checksheet comments:

- ENGE 1414 (4 cr) may be substituted for ENGE 1215 (2 cr) + ENGE 1216 (2 cr).
- MATH 2405H (5 cr) may be substituted for MATH 2114 (3 cr).
- MATH 2405H (5 cr) + MATH 2406H (5 cr) may be substituted for MATH 2114 (3 cr) + MATH 2204 (3 cr) + MATH 2214 (3 cr).

#### B.S. in Mining Engineering Technical Electives

Courses with substantial duplication of courses taken previously will not qualify for credit. Independent Study (4974) and Undergraduate Research (4994) may not be used as electives. Additional technical electives may be used as a substituted course through a 4984 or 5984 special topics course with the review and approval from the department head.

Choose from the courses listed below, noting that some courses are not available to all students because they may have prerequisites or be restricted to major in the offering department.

All Technical Elective courses are 3 credit hours unless designated otherwise.

BSE 4394 - Water Supply and Sanitation in Developing Countries Pre: Junior Senior Standing

CEE 3104 - Intro to Environmental Engineering *c-* or better in Pre: CHEM 1035, CHEM 1045, (MATH 1026 or MATH 1206 or MATH 1206 or MATH 1206 or MATH 2024), (PHYS 2305 or PHYS 2205)

CEE 4264 - Sustainable Land Development Pre: 3274, Senior Standing

CEE 4144 - Air Resources Engr Pre: (CEE 3104 or ENGR 3124 or GEOS 3114 or ENSC 3634), Senior Standing

CEE 3514 - Introduction to Geotechnical Engineering Pre: GEOS 2104 and ESM 2204 (4 cr.)

CEE 4514 - Methods in Geotechnical Engineering Pre: 3514 (C-)

ECON 4014 - Environmental Economics Pre: (2005 or 2116 or 2126 or 2025H)

ENSC 3634 - Physics of Pollution Pre: CSES 3114, PHYS 2206, (MATH 2013 or 2024)

CSES 4644 - Land-based Systems for Waste Treatment

ENSC 4774 - Reclamation of Drastically Disturbed Lands Pre: CSES 3114 or ENSC 3114 or GEOS 3614 or CSES 3134 or ENSC 3134 or CSES 3304 or GEOS 3304 or GEOS 3304

FIN 3104 - Introduction to Finance *Pre: ACIS 2115, Pre: (ACIS 2115 and ECON 2005 and BIT 2405) or (ACIS 2115 and ECON 2005 and STAT 3005) or (ACIS 2115 and ECON 2005 and STAT 3604) or (ACIS 2115 and ECON 2005 and STAT 3605) or (ACIS 2115 and ECON 2005 and STAT 3604) or (ACIS 2115 and ECON 2005 and STAT 3615) or (ACIS 2115 and ECON 2005 and STAT 4706) or (ACIS 2115 and ECON 2005 and STAT 4705) or (ACIS 2115 and ECON 2005 and STAT 4704) or (ACIS 2115 and ECON 2025H and BIT 2405) or (ACIS 2115 and ECON 2025H and STAT 3005) or (ACIS 2115 and ECON 2025H and STAT 3604) or (ACIS 2115 and ECON 2025H and STAT 3615 and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3604) or (ACIS 2115 and ECON 2025H and STAT 3615 and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 4706) or (ACIS 2115 and ECON 2025H and STAT 4706) or (ACIS 2115 and ECON 2025H and STAT 4704)* 

FIN 3134 - Financial Analytics *Pre:* (ACIS 2115 and ECON 2005 and BIT 2405) or (ACIS 2115 and ECON 2005 and CMDA 2005) or (ACIS 2115 and ECON 2005 and STAT 3605) or (ACIS 2115 and ECON 2005 and STAT 3615 and STAT 3615 and STAT 3616) or (ACIS 2115 and ECON 2005 and STAT 4604) or (ACIS 2115 and ECON 2005 and STAT 4706) or (ACIS 2115 and ECON 2005 and STAT 4706) or (ACIS 2115 and ECON 2025 and STAT 4714) or (ACIS 2115 and ECON 2025H and BIT 2405) or (ACIS 2115 and ECON 2025H and CMDA 2005) or (ACIS 2115 and ECON 2025H and STAT 3005) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3615) or (ACIS 2115 and ECON 2025H and STAT 3615) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115 and ECON 2025H and STAT 3616) or (ACIS 2115

FIN 3144 - Investments, Debt, Equity and Derivatives Pre: 3134, Sophomore Standing

FIN 3154 - Corporate Finance Pre: 3134, Sophomore Standing

FIN 4144 - International Financial Management Pre: 3104, 3134

FIN 4214 - Financial Modeling in Excel Pre: 3134, 3144, 3154

FREC/NR 4014 Natural Resources Economics Pre: ECON 2005 or AAEC 1005

GEOG/GEOS 4354 - Introduction to Remote Sensing

GEOS 3014 - Environmental Geosciences

GEOS 3204 - Sedimentology-Stratigraphy Pre: 1004 or 2024 or 2104

GEOS 3504 (MSE 3104) - Mineralogy Pre: CHEM 1035

GEOS 3614 (CSES 3114) - Soils Pre: CHEM 1036

GEOS 4164 - Potential Field Methods in Exploration Geophysics Pre: 3104, (MATH 2204 or MATH 2204H), MATH 2214, PHYS 2306

GEOS 4404 - Advanced Structural Geology Pre: 3404

GEOS 4634 - Environmental Geochemistry Pre: MATH 1225, CHEM 1035

GEOS 4804 - Groundwater Hydrology Pre: (MATH 1226 or MATH 2024), (PHYS 2205 or PHYS 2305)

ISE 4004 - Theory of Organization

ISE 4654 - Principles of Industrial Hygiene

MGT 3304 - Management Theory & Leadership Practice Pre: Sophomore Standing

MGT 4314 - International Management Pre: Junior Standing

MINE 2714 - Introduction to Petroleum and Natural Gas Engineering

MINE 3714 - Petroleum and Natural Gas Reservoir Engineering Pre: 2714

MINE 3724 - Formation Evaluation and Engineering Pre: 2714

MINE 4714 - Well Drilling and Completion Engineering Pre: 2714

## APPROVED COMMISSION ON UNDERGRADUATE STUDIES AND POLICIES

MINE 4724 - Petroleum and Natural Gas Production Engineering Pre: 2714

MSE 3304 - Physical Metallurgy Pre: MSE 2044

PSYC 3024 - Human Behaviors and Natural Environments Pre: 1004

PSYC 3054 - Health Psychology Pre: 1004 or 2004

UAP 3354 - Introduction to Environmental Policy and Planning

UAP 4264 - Environmental Ethics & Policy Pre: Junior or Senior Standing

UAP 4374 - Land Use & Environment: Planning & Policy Pre: Junior Standing