COLLEGE OF SCIENCE
Geosciences

THE ACCELERATED MASTER'S PROGRAM IN ECONOMIC GEOLOGY

Student Handbook

Last updated: 4/18/2025

University of Arizona

Table of Contents

Overview

The Accelerated Master's Program (AMP) in Economic Geology (EG) is designed to enable outstanding UA Geosciences undergraduate students to complete both the BS in Geosciences (or Planetary Geosciences) degree and the Professional Science Master's in Economic Geology in five years. The program is intended for students interested in enhancing their skill set and competitiveness in the mineral resources job market as well as those aspiring for an academic career. It can serve a wide variety of student interests; those interested in an industry track can do an industry-focused project, whereas those interested in pursuing more academic goals should do a master's thesis.

Note: This program is not open to UA students who completed the BS or advanced degree or students from other institutions.

Eligibility

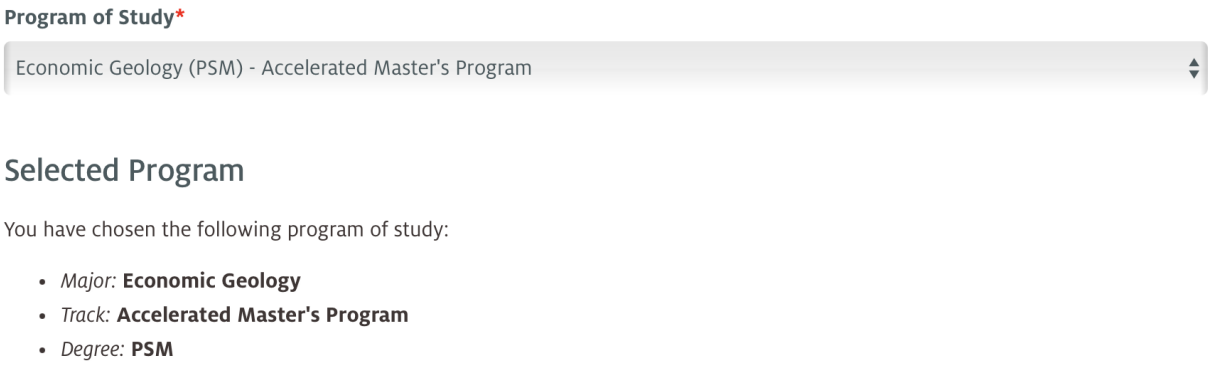
To be considered for the Accelerated Master's Program in Economic Geology, students must meet these criteria at the time of application:

- Be a current, continuing University of Arizona undergraduate enrolled either in the BS in Geosciences (Geology or Geophysics or Gem Science sub-plans) or the BS Planetary Geosciences,
- Have a minimum cumulative GPA of 3.3,
- A minimum of 12 undergraduate units must have been completed in the student's major at the University of Arizona's main campus),
- Completition of a minimum of 75 undergraduate credit hours at the time of application and 90 credit hours at the time of entry into the AMP,
- Completion or near completion of General Education requirements,
- If accepted into the program, students can take 12 graduate credits in their 4th (senior) year, which apply toward both the BS and PSM.
- It is recommended that students being admitted into the AMP identify a potential advisor with whom they wish to complete their Master's Project or Thesis.

Applying to the AMP

Applications to the AMP are accepted **by February 15** for students graduating with a BS in Spring of the following year and **by October 15** for students graduating with a BS in the Fall of the following year.

Applications for the AMP are submitted directly through the UA Graduate College (UA Grad App), and students must select the Economic Geology (PSM)-Accelerated Master's Program option:



Students are encouraged to apply during their junior year so that they can take graduate-level courses throughout their senior year. Seniors are welcome to apply, but if accepted, they would be required to condense their starting graduate-level work (approximately two graduate courses) into the final semester of their senior year.

Late applications may be considered on a case-by-case basis

The formal admission application requires the following:

1. **Statement of Purpose**

Your statement of purpose should be **no more than one page**. We recommend that you discuss why you are interested in Economic Geology, what your career goals are, any specific geoscience-related interests, including the field of studies and professors, and why you believe you are a strong candidate for the AMP program.

Upload your electronic statement to your Graduate College online application.

2. **One Letter of Recommendation**

Please note that recommendation letters are submitted electronically and should be produced on official letterheads. Individuals should be well acquainted with you and be able to comment on your qualifications and promise of a career in Economic Geology.

Recommendation letters are submitted using the recommendation module in the Graduate College online application. It is important to note that you can only input the recommender's name and email address. The recommender received then a link with instructions to upload the letter.

3. **Resume or Curriculum Vitae**

Your resume or CV must include any relevant work experience, research, publications, and/or activities that demonstrate your potential as an AMP student.

Use the Graduate College online application form to upload your electronic resume or CV.

4. **Unofficial Transcript**

Upload your unofficial transcript to the online application. These can be obtained via UAccess Student Center. Please note that transcripts must be current up to the point of application.

Email the Graduate Program Coordinator Rocina Garcia (rocinagarcia@arizona.edu) for an Application Authorization Code.

Registering for 500-level courses as an undergraduate

Before AMP students have completed their Bachelor's degree, they should register for 500-level courses using a 500 Level course petition: click here. If the link doesn't work, please go to the Graduate College forms and choose the corresponding form from the page.

Students are to mark that they wish to enroll in the Accelerated Master's Program (AMP) for their coursework, obtain instructor permission, and have the Major's advisor and Department Head sign off on the form before submitting it to the Graduate College and then finally to the Registrar's office. One form must be used for each semester in which students wish to register for graduate-level courses. Per policy, up to 12 units of these courses will apply towards both the Bachelor's and the Master's Degrees.

Applying to the Graduate College

During their fourth year, students will need to officially apply to the UA Graduate College (click here). For Fall semester applications, the deadline is February 15 and for the Spring Semester, the application deadline is October 15. Under plan of study, students must elect "Economic Geology (PSM)" program. Students must apply online.

General UA Graduate College's Policies

- Completion of a minimum of 75 undergraduate credit hours will be required at the time of application; a minimum of 90 undergraduate credit hours will be required at the time of entry into the AMP. If the student's GPA falls below 3.3 at the time they have completed 90 units, the student will not be admitted into the program. Courses taken for audit may not be included in the total number of units counted for eligibility or admission.
- Completion of at least 12 earned undergraduate credits in their major at the University of Arizona.
- Units still graded Incomplete, units graded Pass/Fail or units taken as audit will not count toward the requirement of the 12 undergraduate units in the major.
- Completion or near completion of general education requirements.
- Submission of a graduate AMP application and payment of a graduate application fee.
- Demonstration of the maturity necessary for success in an accelerated, highly competitive program.
- Students will be considered undergraduates until they complete their undergraduate requirements, which should be no later than the end of the fourth year.
- Students entering with Advanced Placement Credit and/or who attend summer school may complete their Bachelor's degree in the Junior year.
- During years 1-3 (or approximately 0-90 credits) students will be taking undergraduate coursework and charged at the undergraduate rate.
- Once admitted to AMP, during the senior (or transition year), students may take up to 12 units of graduate coursework that may apply toward both the Bachelor's and the Master's degrees. Students will be charged at the undergraduate rate and retain eligibility for undergraduate scholarships.

- Students classified as seniors who have not yet completed a bachelor's degree may enroll in 500-level courses following the Graduate Credit for Seniors Policy. Courses numbered at the 600, 700 and 900 levels are not open to undergraduates.
- When the student nears completion of all Bachelors' requirements, the student will submit an application for admission to the graduate Master's program. There is no application fee for admitted AMP students. The student should apply by the program application date. Once the student has graduate status, the student will be charged at the graduate rate and be eligible for graduate assistantships. The student won't be eligible to graduate, nor will they be eligible for assistantships until all Bachelors' requirements are completed. While an undergraduate, students are required to keep their graduate coursework cumulative GPA at 3.0, or higher if required by the graduate degree offering unit, to be admitted to the Master's program.

Curriculum

Students from the BS in Geosciences and Planetary Geosciences can apply for the AMP program. The undergrad coursework follows what is recommended for the bachelor's degree (and its respective tracks). For the BS in Geosciences, only students enrolled in the Geology, Geophysics, and Gem Sciences will be admitted to the program. Students who did not take Structural Geology and Field work during the Junior year are advised to enroll during the Senior year. These courses are prerequisites for GEOS 504B Lowell Program Topics in Ore Deposits Mapping and GEOS 504G Structural Geology for Exploration and Mine Geologists.

The PSM in Economic Geology program requires students to complete at least 30 graduate units, including 6 units of either a Master's report (GEOS 909) or Thesis (GEOS 910); Geosciences colloquium (GEOS 595A Topics in Geosciences – 2 credit units); and a minimum of 22 units of the graduate coursework in Economic Geology. Students must complete 12 units of Economic Geology Graduate Courses during Year 4, including GEOS 546 which is a required course, and 9 credits from the Economic Geology Emphasis courses (see below). These must be taken in AMP status and require the Undergraduate Enrollment in Graduate Courses form to be approved by the Office of the Registrar with the selection of graduate courses that will be used toward the corresponding graduate and undergraduate degrees (see instructions above). The remaining 10 credits will be fulfilled during the master's year and again selected from the Economic Geology Emphasis courses.

The Economic Geology Emphasis course requirements consist of a **minimum of 19 units** of the following:

- GEOS 504B, Lowell Program Topics in Ore Deposits Mapping
- GEOS 504C, Lowell Program Topics in Mineral Deposit Types
- GEOS 504D, Geological Inputs to Integrated Planning
- GEOS 504E, Mine Engineering Inputs to Integrated Planning
- GEOS 504F, Metallurgical Inputs to Integrated Planning
- GEOS 504G, Structural Geology for Exploration and Mine Geologists
- GEOS 504H, Hyperspectral Imaging for Mining and Mineral Resources
- GEOS 518, Geometallurgy
- GEOS 543C, Geologic Best Practices and Project Stages
- GEOS 581A, Mineralogical Principles for Resource Geology
- GEOS 581B, Petrological and Geochemical Principles for Resource Geology
- GEOS 646, Advanced Ore Deposits Geology

Creating a Master's Committee

Once accepted to the AMP, the student's first priority is to set up their Master's Committee. The committee is a group of 3 individuals that will guide students in selecting core and elective courses and will eventually be the committee before which the student will conduct the Master's Thesis or Project defense. Two members of the committee must be tenure-track or career-track UA faculty members (that is, faculty members who hold the title of Assistant Professor, Associate Professor, or Professor). The third member is permitted to hold a different title but must be approved by the UA Graduate College (contact the AMP Program Coordinator for directions on how to request approval). The primary research advisor will serve as a student's Master's Committee Chair (if tenure-track or career-track) or co-chair (otherwise). To allow for proper guidance and oversight, the Master's thesis committee must be assembled before the final semester of the fourth year.

Creating and submitting the Plan of Study

Once the student has been officially accepted to the UA Graduate College, they must complete the Master's plan of study. The Plan of Study is essentially a list of courses that the student has taken or is planning to take to complete the Master's degree, including courses that the Master's Committee has approved for elective coursework and any substitutions the committee has approved for core courses. Students must access MyGradColl from the Graduate College website

(http://grad.arizona.edu/) to access the official template for the Master's Plan of Study. Once completed, the student should print out one copy of the plan, have their primary advisor sign section 7 and 8b (Major Advisor), sign for the Student Signature line, and submit this to the GEOS Graduate Coordinator (Rocina Garcia). The Graduate Coordinator will then obtain Department Head approval (8a), make a copy for the student's files, and then submit the original and necessary copies to the Graduate College's Degree Certification Office. The plan must be completed and fully reviewed no later than the end of Semester 8.

Research and Master's Report or Thesis

AMP students should have a research advisor who is either a GEOS tenure-track, joint, or research faculty member. Ideally, the research project should be started at least during the fall of the student's fourth year. This is especially important if the student opts for a Master's thesis instead of the Master's report.

Funding as Graduate Students

Students may wish to inquire about funding opportunities in preparation for conversion to graduate status. The Geosciences department does not guarantee graduate funding for AMP students. The students may check with their research advisor regarding any funding available.

Should students be appointed to be teaching assistants, they must complete the Graduate Assistants in Teaching Orientation (GATO) before teaching and the Teacher Assistant Training Online (TATO). For more information, please visit http://grad.arizona.edu/ta.

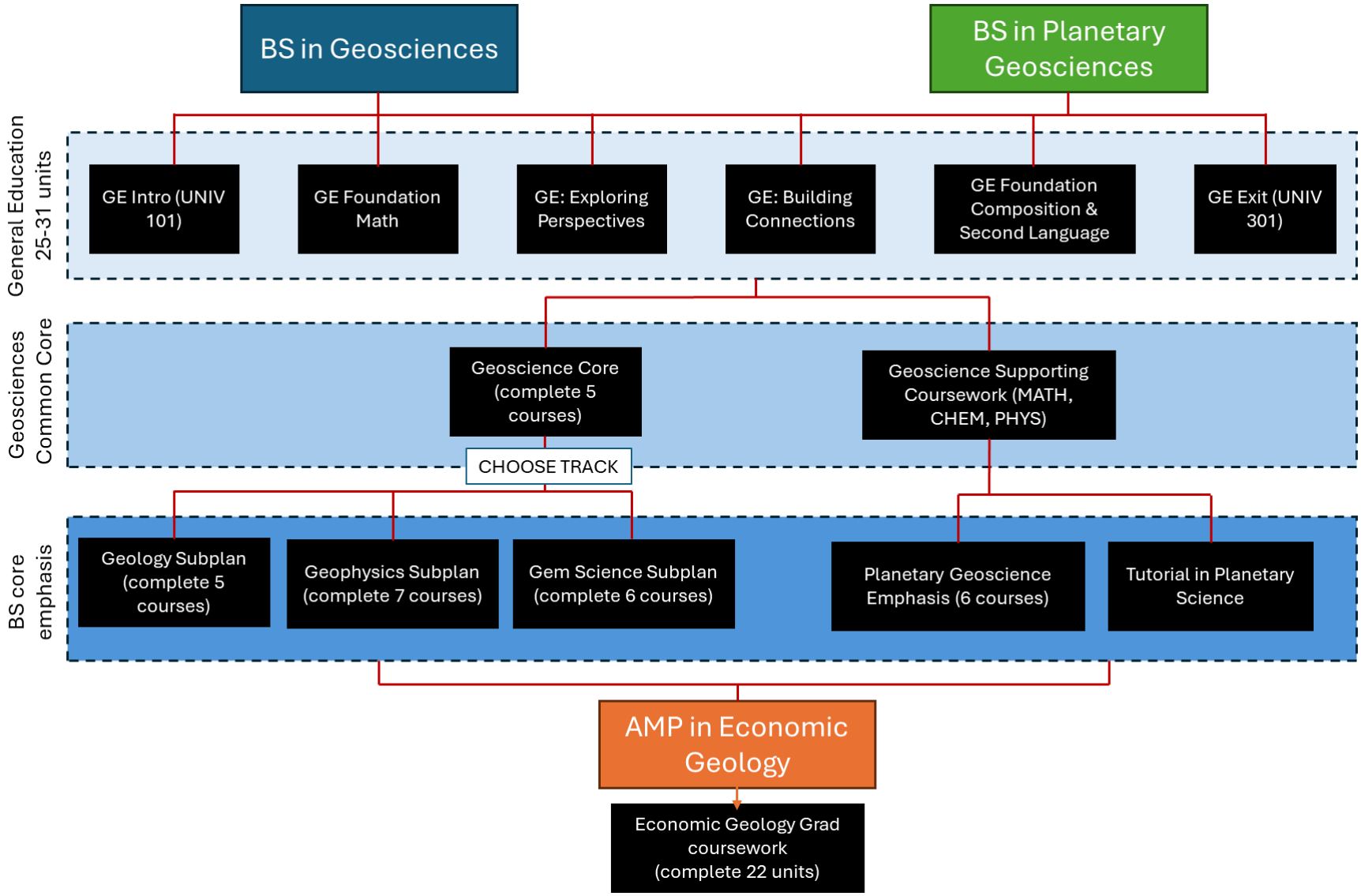
Contact Information

Any questions regarding the Accelerated Master's Program in Economic Geology (AMP-EG) may be directed to:

Dr. Marta Codeço
Manager, LPEG
Gould-Simpson Building, Room 524
mscodeco@arizona.edu

APPENDIX

Curriculum Map



Sample Plan of Study for BS in Geosciences

AMP with a BS in Geosciences – sub-plan in Geology

Year one: Undergraduate Work

Semester 1		**Semester 2**	
Course prefix and number	**Units**	**Course prefix and number**	**Units**
*GEOS 251	4	[1]Geology Emphasis	3
MATH 122A/B	5	MATH 129	3
ENGL 101	3	CHEM 152 *or* MSE 110	4
*CHEM 151	4	ENGL 102	3
UNIV 101	1	GE Core: EP or BC	3
Total	**17**	**Total**	**16**
		Total Year 1	**33**

*GenEd Exploring Perspectives Nat Scientist can be fulfilled with CHEM 151 or GEOS 251

** Second language requirement can be met by credit or proficiency exam

Year 2: Undergraduate Work

Semester 3		**Semester 4**	
Course prefix and number	**Units**	**Course prefix and number**	**Units**
GEOS 306	3	GEOS 300	3
MATH 163 *or* MATH 223	3	GEOS 356	3
PHYS 102/181	4	PHYS 103/182	4
GE Core: EP or BC	3	GE Core: EP or BC	3
Total	**13**	**Total**	**14**
		Total Year 2	**27**

Year 3: Undergraduate Work

Semester 5		**Semester 6**	
Course prefix and number	**Units**	**Course prefix and number**	**Units**
GEOS 302	4	GEOS 304	4
GEOS 280	3	GEOS 322	3
[1]Geology Emphasis	3	[1]Geology Emphasis	3
GE Core: EP or BC	3	GE Core: EP or BC	3
		Capstone Field Experience (Summer)	6
Total	**13**	**Total**	**19**
		Total Year 3	**32**

Year 4: AMP (Undergraduate + Graduate Work)

Semester 7		Semester 8	
Course prefix and number	**Units**	**Course prefix and number**	**Units**
[1]Geology Emphasis	3	[1]Geology Emphasis	3
Elective	3	GEOS 308	3
GE Core: EP or BC	3	[2]Economic Geology emphasis (Grad)	5
GEOS 546	3	UNIV 301	1
[2]Economic Geology emphasis (Grad)	4		
Total	16	**Total**	12
		Total Year 4	**28**

Total of units for BS completed: 120

Total of grad units completed during Senior year 12

Year 5: Master's year (Graduate Work)

Semester 9		Semester 10	
Course prefix and number	**Units**	**Course prefix and number**	**Units**
[2]Economic Geology emphasis (Grad)	3	[2]Economic Geology emphasis (Grad)	3
[3]Economic Geology Electives (Grad)	4	GEOS 595A	1
GEOS 595A	1	GEOS 909 or GEOS 910	3
GEOS 909 or GEOS 910	3		
Total	11	**Total**	7
		Total Year 5	**18**

Total of units for PSM completed: 30

[1]*Geology Emphasis:*

GEOS Geology Advisor approved emphasis courses (15 units)

GEOS 195D	A Sense of Place	Spring	1
GEOS 240	National Parks: A Window Through Earth's Geological Processes	Fall	1
GEOS 255	Historical Geology	Spring	4
GEOS 260	Introduction to Gems and Minerals (*)	Fall	3
GEOS 270	Planetary Geoscience	Spring	3
GEOS 342	The History of Earth's Climate	Fall	3
GEOS 397A	Preceptorship	all	1-3
GEOS 400	Introduction to Geochemistry (*)	Spring	3
GEOS 412A	Ocean Sciences	Spring	3
GEOS 412B	Ocean Sciences Field Course	Spring	1
GEOS 415	Geologic Hazards	Fall	2
GEOS 417	Sedimentary Basin Analysis	Fall	3
GEOS 419	Physics of the Earth (*)	Spring	3
GEOS 423	Regional Structural Geology (*)	Spring	3
GEOS 425	Regional Tectonics (*)	Fall	3
GEOS 427	Orogenic Systems	Spring	3
GEOS 430	The Chemical Evolution of Earth (*)	Spring	3
GEOS 432	Introduction to Seismology (*)	Spring	3
GEOS 434A	Introduction to Exploration Seismology (*)	Fall	3
GEOS 439A	Introduction to Dendrochronology	Fall	3
GEOS 440	Geodynamics (*)	Spring	3
GEOS 446	Economic Mineral Deposits (*)	Fall	3
GEOS 450	Geomorphology and Landscape Evolution	Fall	3
GEOS 453	Glacial and Quaternary Geology	Spring	3
GEOS 456	Thrust Belts and Synorogenic Sediments	Spring	3
GEOS 460	Characterization and Identification of Minerals (*)	Spring	3
GEOS 462	Petrology of Gems (*)	Spring	3
GEOS 466	Stable Isotope Geochemistry and Paleoclimate	Fall	3
GEOS 469	Seismic Data Processing	Spring	3
GEOS 470L	Volcanology: Laboratory and Field Methods (*)	Spring	1
GEOS 470R	Volcanology: Physical Processes and Petrologic Applications (*)	Spring	3
GEOS 477	Active Tectonics	Spring	3
GEOS 478	Global Change	Fall	3
GEOS 479	Intro to Climate Dynamics	Spring	3
GEOS 482	Paleoclimatology & Paleoceanography	Fall	3
GEOS 482B	Petrology and Geochemistry for Resource Geology	Spring	1-4
GEOS 483	Modes of Climate Variability	Spring	4
GEOS 484	Co-evolution of Earth and Biosphere	Fall	3
GEOS 486	Organic Geochemistry	Fall	3

GEOS 487	Physical and Dynamical Oceanography	Fall	3

(*) Recommended for the AMP in Economic Geology

Full list:

ANTH 304, ANTH 335, ANTH 435, ANTH 439A, ASTR 403, ASTR 442, ATMO 412A, CHEM 325, CHEM 326, CHEM 480A, CHEM 480B, ECOL 335, ECOL 360, ECOL 406L, ECOL 406R, ECOL 412A, ECOL 412B,ENVS 412A, GEN 402, GEN 416, GEN 427, GEN 448, GEOG 430, GEOG 438, GEOG 439A, HWRS 350, HWRS 411, HWRS 431, HWRS 480, MATH 313, MATH 322, MNE 402, MNE 427, MSE 412, PHYS 403, PTYS 403, PTYS 411, PTYS 442, WSM 439A, Approved Transfer Course

[2]*Economic Geology Emphasis courses – complete 15 credit units*

GEOS 504B	Lowell Program Topics in Ore Deposits Mapping	Fall	1-2
GEOS 504C	Lowell Program Topics in Mineral Deposit Types	Fall	1-2
GEOS 504D	Geological Inputs to Integrated Planning	Fall/Spring	1
GEOS 504E	Mine Engineering Inputs to Integrated Planning	Fall/Spring	1
GEOS 504F	Metallurgical Inputs to Integrated Planning	Fall/Spring	1
GEOS 504G	Structural Geology for Exploration and Mine Geologists	Spring	1-2
GEOS 504H	Hyperspectral Imaging for Mining and Mineral Resources	Spring	3
GEOS 518	Geometallurgy	Spring	4
GEOS 543C	Geologic Best Practices and Project Stages	TBD	3
GEOS 581A	Mineralogical Principles for Resource Geology	Fall	1-4
GEOS 581B	Petrological and Geochemical Principles for Resource Geology	Spring	1-4
GEOS 646	Advanced Ore Deposit Geology	Fall	4

[3]*Economic Geology Electives*

GEOS 500	Introduction to Geochemistry **	Spring	3
GEOS 504B	Lowell Program Topics in Ore Deposits Mapping	Fall	1-2
GEOS 504C	Lowell Program Topics in Mineral Deposit Types	Fall	1-2
GEOS 504 D	Geological Inputs to Integrated Planning	Fall/Spring	1
GEOS 504E	Mine Engineering Inputs to Integrated Planning	Fall/Spring	1
GEOS 504F	Metallurgical Inputs to Integrated Planning	Fall/Spring	1
GEOS 504G	Structural Geology for Exploration and Mine Geologists	Spring	1-2
GEOS 504H	Hyperspectral Imaging for Mining and Mineral Resources	Spring	3
BNAD 510	Foundations of Business for Scientists	Fall	3
MNE 511	Mineral Processing	Fall	3
HWR 513A	Field Hydrology Methods	Spring	2
GEOS 516	Field Studies in Geophysics	Spring	3
GEOS 518	Geometallugy	Spring	4
MNE 519	Mine Planning Software	Spring	1
GEOS 523	Regional Structural Geology **	Spring	3

GEOS 525	Regional Tectonics **	Fall	3
GEOS 527	Orogenic Systems **	Spring	3
MNE 527	Geomechanics	Fall	3-4
GEOS 531	Hydrogeology	Fall	4
MNE 536	Surface Mine Planning and Design	Spring	3
MNE 538	Underground Mine Design	Spring	2
GEOS 543C	Geologic Best Practices and Project Stages		3
GEOS 548	Geophysical Exploration and Engineering **	Fall	3
GEOS 556	Thrust Belts and Synorogenic Sediments	Spring	3
GEOS 570L	Volcanology: Laboratory and Field Methods **		
GEOS 570R	Volcanology: Physical Processes and Petrologic Applications**	Spring	3
HWRS 576	Natural Resource Law and Economics	Spring	3
MIS 578	Project Management	Spring/Summer	3
GEOS 581A	Mineralogical Principles for Resource Geology	Fall	1-4
GEOS 581B	Petrological and Geochemical Principles for Resource Geology	Spring	1-4
MNE 583	Introduction to Moon Mining	Spring	3
GEOS 596A	Mineralogy-Petrology-Geochemistry	Fall	1-4
GEOS 596B	Economic Geology	Fall	1-4
GEOS 646A	Advanced Ore Deposit Geology		4
GEOS 646B	Advanced Ore Deposits II		4
LAW 640	Comparative Mining Law	Fall	2-3
MNE 697C	Basic Concepts in Mineral Economics	Spring	1
MNE697F	Valuation of Mineral Assets and Projects	Spring	2
MNE 697K	Introduction to Social & Environmental Assessment	Spring	1

** can also be completed as part of Geology Emphasis

AMP (BS Geosciences – sub-plan in Geophysics)

Year one: Undergraduate Work

Semester 1		Semester 2	
Course prefix and number	Units	Course prefix and number	Units
GEOS 251	4	[4]Geophysics emphasis	3
MATH 122A/B or 125	3	MATH 129	3
ENGL 101	3	CHEM 151	4
GE Core: EP or BC	3	ENGL 102	3
UNIV 101	1	GE Core: EP or BC	3
Total	14	Total	16
		Total Year 1	30

*GenEd Exploring Perspectives Nat Scientist can be fulfilled with CHEM 151 or GEOS 251

** Second language requirement can be met by credit or proficiency exam

Year 2: Undergraduate Work

Semester 3		Semester 4	
Course prefix and number	Units	Course prefix and number	Units
GEOS 306	3	GEOS 356	4
MATH 223	4	PHYS 142	3
PHYS 141	4	MATH 254	3
GE Core: EP or BC	3	GE Core: EP or BC	3
		GEOS 285	3
Total	14	Total	16
		Total Year 2	30

Year 3: Undergraduate Work

Semester 5		Semester 6	
Course prefix and number	Units	Course prefix and number	Units
GEOS 302	4	GEOS 304	4
GEOS 322	3	GEOS 300	3
MATH 313	3	MATH 322	3
GE Core: EP or BC	3	[4]Geophysics emphasis	3
		Capstone Field Experience (Summer)	6
Total	13	Total	19
		Total Year 3	32

Year 4: AMP (Undergraduate + Graduate Work

Semester 7		Semester 8	
Course prefix and number	Units	Course prefix and number	Units
GEOS 434A	3	[4]Geophysics emphasis	3
GEOS 432	3	GEOS 419	3
GE Core: EP or BC	3	UNIV 301	1
GEOS 546	3	[2]Economic Geology emphasis (Grad)	5
[2]Economic Geology emphasis (Grad)	4		
Total	16	Total	5
		Total Year 4	28

Total of units for BS completed: 120

Total of grad units completed during Senior year 12

Year 5: AMP (Graduate Work)

Semester 9		Semester 10	
Course prefix and number	Units	Course prefix and number	Units
[2]Economic Geology emphasis (Grad)	3	[2]Economic Geology emphasis (Grad)	3
[3]Economic Geology Electives (Grad)	4	GEOS 595A	1
GEOS 595A	1	GEOS 909 or GEOS 910	3
GEOS 909 or GEOS 910	3		
Total	11	Total	7
		Total Year 5	18

Total of units for PSM completed: 30

[4]*Geophysics Emphasis:*

GEOS Geophysics Advisor approved emphasis courses (9 units)

GEOS 240	National Parks: A Window Through Earth's Geological Processes	Fall	1
GEOS 255	Historical Geology	Spring	4
GEOS 260	Introduction to Gems and Minerals (*)	Fall	3
GEOS 270	Planetary Geoscience	Spring	3
GEOS 397A	Preceptorship	every semester	1-3
GEOS 400	Introduction to Geochemistry (*)	Spring	3
GEOS 403	Physics of the Solar System	Spring	3
GEOS 417	Sedimentary Basin Analysis (*)	Fall	3
GEOS 423	Regional Structural Geology (*)	Spring	3
GEOS 425	Regional Tectonics (*)	Fall	3
GEOS 427	Orogenic Systems (*)	Spring	3
GEOS 440	Geodynamics (*)	Spring	3
GEOS 446	Economic Mineral Deposits (*)	Fall	3
GEOS 462	Petrology of Gems (*)	Spring	3
GEOS 477	Active Tectonics	Spring	3
GEOS 479	Introduction to Climate Dynamics	Fall/Spring	3
GEOS 482	Paleoclimatology & Paleoceanography	Fall	3
GEOS 565	Geophysical Methods in Planetary Analog Field Research	Summer	3
GEOS 567	Inverse Problems in Geophysics	Spring	3
GEOS 568	Advanced Seismology	Fall	3

(*) Recommended for the AMP in Economic Geology

Full list:

ASTR 403, ASTR 442, ENVS 330, GEN 330, GEN 416, GEN 448, GEOG 330, GEOG 403, GEOG 417, GEOG 419, GEOG 420, GIST 330, GIST 417, GIST 420, HWRS 411, HWRS 431, MATH 363, PHYS 403, PTYS 403, PTYS 407, PTYS 411, PTYS 442, PTYS 567, RNR 403, RNR 417, RNR 419, RNR 420, WSM 330, Approved Transfer Course

AMP (BS Geosciences – sub-plan in Gem Science)

For the Gem Science track, students must take either GEOS 304 Structural Geology or GEOS504G Structural Geology for Exploration and Mineral Resources.

Year one: Undergraduate Work

Semester 1		Semester 2	
Course prefix and number	Units	Course prefix and number	Units
GEOS 251	4	[5]Gem Science Emphasis	3
MATH 122A/B or 125	3	MATH 129	3
ENGL 101/107	3	CHEM 151	4
CHEM 151	4	ENGL 102/108	3
UNIV 101	1	GE Core: EP or BC	3
Total	14	Total	16
		Total Year 1	30

*GenEd Exploring Perspectives Nat Scientist can be fulfilled with CHEM 151 or GEOS 251

** Second language requirement can be met by credit or proficiency exam

Year 2: Undergraduate Work

Semester 3		Semester 4	
Course prefix and number	Units	Course prefix and number	Units
GEOS 260	4	GEOS 300	3
MSE 110	4	GEOS 285	3
MATH 223	3	PHYS 141	4
GE Core: EP or BC	3	GE Core: EP or BC	3
Elective	3		
Total	16	Total	13
		Total Year 2	30

Year 3: Undergraduate Work

Semester 5		Semester 6	
Course prefix and number	Units	Course prefix and number	Units
GEOS 306	4	GEOS 456	4
[5]Gem Science Emphasis	3	[6]Gem Science Emphasis	3
PHYS 142	3	MSE 480	3
GE Core: EP or BC	3	GE Core: EP or BC	3
		Capstone Field Experience (Summer)	6
Total	13	Total	19
		Total Year 3	32

Year 4: AMP (Undergraduate + Graduate Work

Semester 7		Semester 8	
Course prefix and number	Units	Course prefix and number	Units
GEOS 302	3	[5]Gem Science Emphasis	3
GEOS 400 or 474	3	GEOS 462	3
[5]Gem Science Emphasis	3	UNIV 301	1
GEOS 546	3	[2]Economic Geology emphasis (Grad)	5
[2]Economic Geology emphasis (Grad)	4		
Total	16	Total	12
		Total Year 4	28

Total of units for BS completed: 120

Total of grad units completed during Senior year 12

Year 5: AMP (Graduate Work)

Semester 9		Semester 10	
Course prefix and number	Units	Course prefix and number	Units
[2]Economic Geology emphasis (Grad)	3	[2]Economic Geology emphasis (Grad)	3
[3]Economic Geology Electives (Grad)	4	GEOS 595A	1
GEOS 595A	1	GEOS 909 or GEOS 910	3
GEOS 909 or GEOS 910	3		
Total	11	Total	7
		Total Year 5	18

[5]*Gem Science Emphasis:*

GEOS Gem Science Advisor approved emphasis courses (13 units)

GEOS 240	National Parks: A Window Through Earth's Geological Processes	Fall	1
GEOS 255	Historical Geology	Spring	4
GEOS 260	Intro to Gems and Minerals (*)	Fall	3
GEOS 304	Structural Geology (*)	Spring	4
GEOS 346	Mineral and Energy Resources (*)	Fall	3
GEOS 397A	Preceptorship	every semester	1-3
GEOS 400	Introduction to Geochemistry (*)	Spring	3
GEOS 408	Tectonic Petrology (*)	Spring	3
GEOS 427	Orogenic Systems (*)	Spring	3
GEOS 440	Geodynamics (*)	Spring	3
GEOS 446	Economic Mineral Deposits (*)	Fall	3
GEOS 462	Petrology of Gems (*)	Spring	3

Full list:

ANTH 201, ART 237, CHEM 325, CHEM 326, CHEM 480A, CHEM 480B, MNE 201, OPTI 201R, OPTI 201L, OPTI 202R, OPTI 202L, OPTI 210, OPTI 330, OPTI 340, OPTI 340A, OPTI 404, OPTI 484, OPTI 485, RCSC 114, RCSC 240, RCSC 320, RCSC 360, Approved Transfer Course

Sample Plan of Study for BS in Planetary Geosciences

For the BS in Planetary Geosciences, it is recommended that students opt for the Capstone field experience instead of PTYS 498/H, as fieldwork is an essential requirement for the PSM. To prepare for the PSM, students should complete all the following (GEOS 300, 302, 304, 306, 322, and 356).

Year one: Undergraduate Work

Semester 1		Semester 2	
Course prefix and number	Units	Course prefix and number	Units
MATH 122A/B or 125	3	GEOS 251	4
ENGL 101 / 107	3	MATH 129	3
GE Core: EP or BC	6	PHYS 141	4
UNIV 101	1	ENGL 102 / 108	3
Total	13	Total	14
		Total Year 1	27

*GenEd Exploring Perspectives Nat Scientist can be fulfilled with CHEM 151 or GEOS 251

** Second language requirement can be met by credit or proficiency exam

Year 2: Undergraduate Work

Semester 3		Semester 4	
Course prefix and number	Units	Course prefix and number	Units
MATH 223	3	GEOS 300	3
PHYS 142	4	GEOS 304	4
PTYS 270	3	CHEM 151	4
GEOS 285	3	PTYS 395B	3
GE Core: EP or BC	3		
Total	16	Total	14
		Total Year 2	30

Year 3: Undergraduate Work

Semester 5		Semester 6	
Course prefix and number	Units	Course prefix and number	Units
GEOS 302	4	PTYS 403	3
GEOS 306	3	[6]Planetary Geoscience Emphasis	6
GE Core: EP or BC	3	GE Core: EP or BC	3
Elective	3		
		Capstone Field Experience (Summer)	6

Total	14	Total	18
		Total Year 3	34

Year 4: AMP (Undergraduate + Graduate Work

Semester 7		Semester 8	
Course prefix and number	Units	Course prefix and number	Units
PTYS 407	3	PTYS 411	3
[6]Planetary Geoscience Emphasis	3	Electives	7
UNIV 301	1	[2]Economic Geology emphasis (Grad)	5
GEOS 546	3		
[2]Economic Geology emphasis (Grad)	4		
Total	14	Total	15
		Total Year 4	29

Total of units for BS completed: 120
Total of grad units completed during Senior year 12

Year 5: AMP (Graduate Work)

Semester 9		Semester 10	
Course prefix and number	Units	Course prefix and number	Units
[2]Economic Geology emphasis (Grad)	3	[2]Economic Geology emphasis (Grad)	3
[3]Economic Geology Electives (Grad)	4	GEOS 595A	1
GEOS 595A	1	GEOS 909 or GEOS 910	3
GEOS 909 or GEOS 910	3		
Total	11	Total	7
		Total Year 5	18

Total of units for PSM completed: 30

Geosciences and Planetary Science Courses (12 or more courses)

GEOS 251	Physical Geology	Fall/Spring	4
PTYS/GEOS 270	Planetary Geoscience	Spring	3
Computer Ap:			
GEOS 280	Programming and Data Analysis in the Earth Sciences	Fall	3
or			
GEOS 285	Introduction to Python in Geosciences	Spring	3

plus four of the following

GEOS 300	Earth Surface Processes	Spring	3
GEOS 302	Principles of Stratigraphy and Sedimentation (*)	Fall	4
GEOS 304	Structural Geology	Spring	4
GEOS 306	Mineralogy	Fall	3
GEOS 322	Intro to Geophysics	Spring	3
GEOS 356	Petrology	Spring	4

plus

PTYS 395B	Topics in Planetary Science	Fall	3

plus (all)

PTYS 403	Physics of the Solar System	Spring (odd yrs)	3
PTYS 407	Chemistry of the Solar System (odd years)	Fall (odd yrs)	3
PTYS 411	Geology and Geophysics of the Solar System	Spring (even yrs)	3

Capstone Experience:	GEOS 414 Geology Field		6
Field Camp	*or*		
(in-person)	PTYS 498 Capstone Research		
	or		
	PTYS 498H Honor's thesis		

[6]Planetary Geoscience Advisor approved advanced emphasis courses (9 units)

ASTR 418	Astronomical Instrumentation	Fall (even yrs)	3
ASTR 442	Mars	Spring (odd yrs)	3
ASTR 450	Origin of the Solar System and Other Planetary Systems	Fall (odd yrs)	3
ASTR 475	Planetary Astrobiology	Spring (odd yrs)	3
GEOS 412A	Ocean Sciences	Spring	3
ATMO 490	Remote Sensing for the Study of Planet Earth	Fall	3
ECOL 410	Microbial Biogeochemistry and Global Change	Spring	3