

**MISSOURI STATE UNIVERSITY
 UNDERGRADUATE GEOLOGY PROGRAM
 ALUMNI SURVEY
 SPRING 2009**

[Total surveys sent: 347; Surveys returned: 101; Response Rate: 29.1%]

Question 1: Which of the following best describes your current employment status?

<input type="checkbox"/> employed full-time as a professional geologist or in a closely related field	55	54.5%
<input type="checkbox"/> employed full-time in a professional or technical field at least somewhat related to geology	23	22.8%
<input type="checkbox"/> employed full-time in a field unrelated to geology	14	13.9%
<input type="checkbox"/> unemployed but actively seeking full-time employment in geology or a closely related field	0	0.0%
<input type="checkbox"/> unemployed and actively seeking full-time employment in a field unrelated to geology	1	1.0%
<input type="checkbox"/> not employed full-time at this time by choice	8	7.9%

Question 2: How important has the education you received in the Missouri State Geology program been to your success in your current career?

<input type="checkbox"/> absolutely essential	51	51.0%
<input type="checkbox"/> very useful	30	30.0%
<input type="checkbox"/> somewhat useful	16	16.0%
<input type="checkbox"/> of very little use	3	3.0%

Question 3: How important was the education you received in the Missouri State Geology program to your success in your first full-time professional endeavor after graduation (i.e., in obtaining your first full-time job or in obtaining admission to a graduate program)?

<input type="checkbox"/> absolutely essential	61	61.0%
<input type="checkbox"/> very useful	21	21.0%
<input type="checkbox"/> somewhat useful	14	14.0%
<input type="checkbox"/> of very little use	4	4.0%

Question 4: Completely aside from career considerations, how important has the education you received in the MSU Geology program been for your personal enjoyment and quality of life?

<input type="checkbox"/> absolutely essential	39	39.0%
<input type="checkbox"/> very useful	47	47.0%
<input type="checkbox"/> somewhat useful	14	14.0%
<input type="checkbox"/> of very little use	0	0.0%

Question 5: Indicate your opinion concerning the importance of each of the following Geology courses in an undergraduate Geology program (4=essential; 3=important but not essential; 2=nice to have, but not necessary; 1=unimportant and unnecessary)

	Average
Field Geology (summer "Field Camp")	3.78
Stratigraphy	3.77
Structural Geology	3.75
Mineralogy	3.75
Historical Geology	3.75
Petrology	3.70
Geohydrology	3.39
Geomorphology	3.24
Engineering Geology	2.98
Geochemistry	2.97
Applied Geophysics	2.95
Invertebrate Paleontology	2.87
Petroleum Geology	2.85
Global Tectonics	2.72
Geochemical Techniques	2.68
Optical Mineralogy/Petrography	2.60
Economic Geology (Metallic Ore Deposits)	2.55
Seismic Data Processing	2.53
Oceanography	2.30
Speleology	2.07

Question 6: Indicate your opinion concerning the importance of each of the following ancillary requirements in an undergraduate Geology program (4=essential; 3=important but not essential; 2=nice to have, but not necessary; 1=unimportant and unnecessary)

	Average
At least one year of college-level chemistry	3.78
At least one year of college-level physics	3.61
Introduction to GIS (geographic information systems)	3.40
Mathematics through at least second-semester calculus	3.29
Introduction to air photo interpretation and remote sensing	3.26
Independent study project (undergraduate research, internship, service learning, etc.)	3.08
Statistical data analysis	3.04
At least one semester of college-level biology	2.83
Computer programming languages (C++, Java, etc.)	2.58

Question 7: In light of the significant reduction in state support for higher education in recent years, we are under increasing pressure to reduce the cost of our program. Which of the following cost-cutting options do you feel would do the least harm to the Missouri State Geology program? [NOTE--Some responders choose to elect more than one response, so the percentages total to more than 100%.]

<input type="checkbox"/> increase class size (increase student-to-teacher ratio)	39	38.6%
<input type="checkbox"/> make more extensive use of graduate teaching assistants in laboratory sections	68	67.3%
<input type="checkbox"/> reduce the number of field trips and other out-of-classroom activities	8	7.9%
<input type="checkbox"/> reduce the number of optional upper-division Geology courses offered	8	7.9%
<input type="checkbox"/> reduce the ratio of laboratory experiences to lecture contact hours	1	1.0%

Question 8: If Missouri State had not offered a major in Geology when you were an undergraduate, which of the following paths would you most likely have taken? Some responders choose to elect more than one response.

___ graduate from Missouri State with a major other than Geology	45	44.1%
___ graduate with a major in Geology from another institution in Missouri	48	47.1%
___ graduate with a major in Geology from an institution outside Missouri	9	8.8%
___ not graduate from any university	0	0.0%

Question 9: If your son or daughter expressed an interest in majoring in geology, which would you do?

___ encourage him/her to pursue geology as a career option by majoring in Geology at Missouri State (assuming that the issue of in-state versus out-of-state tuition was not a factor)	67	68.4%
___ encourage him/her to pursue geology as a career option by majoring in Geology at a university other than Missouri State	10	10.2%
___ encourage him/her to pursue geology as an avocation, but not as a career	15	15.3%
___ discourage him/her from pursuing that interest	6	6.1%

Question 10: If your career has involved interaction with geologists who received their undergraduate training at universities other than Missouri State, how would you rank the preparation you received in the Missouri State Geology program relative to those other individuals? **(78 responses)**

This was an open-ended question. Our interpretation of the responses are as follows:

Best	12	15.4%
Better	19	24.4%
Equal to	44	56.4%
Fair	3	3.8%
Poor	0	0.0%

This individual responses are as follows:

1. Equivalent.
2. My preparation was top notch. The time the professors spent with us in the field teaching us in a hands-on environment has set me a cut above the rest.
3. The education I received at MSU was far better than most other colleges.
4. I've been better educated than others - But have noticed that recent MSU geology grads are not as educated or prepared.
5. Similar, but I did not use my training in an everyday manner.
6. About equal to some larger schools (MU). But not as technical toward "real world" applications - Rolla.
7. About the same for traditional "non-technical" universities, i.e. old school.
8. Comparable.
9. Excellent!
10. Above and beyond what they had.
11. As good as any as I am constantly exposed to other geology departments, professors, state geologists, etc. as I am President of ASBOG this year!
12. About equal preparation to a little less than equal preparation.

13. Though my career is in GIS, my undergraduate career in the Geology program is what led me to graduate school and later my job. I think the program instills a strong work ethic that can be applied in any vocation.
14. In terms of geology coursework in the top 10% percentile. In terms of pre-professional courses such as math, chemistry & physics in the mid-range.
15. As good as any! I proudly display my degree in my office to this day.
16. I would say the education I received as at least equal to, but in most cases, superior to other institutions.
17. About the same to less than prepared to others.
18. The MSU degree was as good as or better than other geology degrees received from other universities.
19. Not quite as good.
20. Top 1/4.
21. Depends on the University; however I would say the field opportunities at MSU are above average and invaluable. We were much better prepared for field camp than most others.
22. Preparation was very good, but I was lacking in useful computer skills. Linux or Unix is a basic requirement for oil exploration as a geophysicist.
23. At least equal if not better.
24. Good.
25. Much better in most respects.
26. Equivalent.
27. Excellent.
28. Very good at the undergraduate level of correspondence.
29. Very good.
30. I would rank my preparation as equal to others trained in other programs.
31. I received, after being in this business for 20 years, the best education that money could buy. MSU's Geology program is very good.
32. As good as or better than any other university.
33. Comparable in general. 2 courses I have realized were very useful: 1. Readings & Report Writing and Spring Break Field excursions.
34. Equal to.
35. It has been my experience that MSU Geology Students rank equally or above those of other universities.
36. It is not the institution but the student. How he or she applies that knowledge represented by the institutions.
37. Similar.
38. Equal to.
39. The same, after all experience in the field is what sets everyone apart.
40. Though I have had limited contact with geologists from other universities, of those I have dealt with I would rank my level at or above most.
41. Scholastically very comparable - relationships with professors and other students - no comparison - way better @MSU.
42. Sub-par.
43. Equivalent.
44. MSU has a good program and it stacks up well against any other program.
45. Very good - broad & practical training at MSU in comparison.
46. Very similar, except some have more of an engineering background.
47. Comparable or slightly superior.
48. My geologic preparation from Missouri State placed me in equal status with other geologists I have worked with.

49. Had I known the geological position I was to assume - other classes like Engineering Geology would have helped.
50. I've worked with geologists from many major universities. MO State grads are generally equally as well prepared. At the first company I worked for many Ivy Leaguers were laid off but most MO State grads stayed.
51. When I went to graduate school I was better prepared than most (in the 70's).
52. Excellent. I worked with other geologists from all over the US, but never felt that our program was deficient in any area.
53. On a letter grade basis I would rate my experience as a B grade.
54. Average.
55. It's a very good program but some recognition is sometimes important to other industry professionals, but is not something that MSU has achieved.
56. Others have had more field work.
57. Superior in breadth and depth.
58. When I began Master's Program in 1976 I found I was deficient in chemistry and calculus courses, which I had to take prior to acceptance to the program.
59. I have dealt with many geologists from other universities and I believe that MO State produces graduates at the same level or better than these universities (including some Research Institutions).
60. Equal.
61. I have always felt my geologic training equaled anyone else - at least at undergraduate level. I actually had much better training/ than others from more significant schools.
62. I feel I was at least as prepared a other geologists; however, I feel I lacked hands-on experience with logging and soil identification.
63. Preparation was very good. Before grad school, I needed more math. Could have used more petroleum geol.
64. I believe my training was equal to my fellow colleagues.
65. In working for the state of ARK, I have interacted with many geologists that graduated from Ark Tech University (BS) or University of Arkansas Fayetteville (BS & MS). Based on those interaction and discussions with geologists that graduated from universities other than Ark (UT-Knoxville, OU, Tulane, Penn State), Missouri State Geology program would rank well above the Arkansas Geology programs. Missouri State would be as good as (or better in some areas) as UT-Knoxville, OU, etc.
66. Middle of road - definitely comparable to better than average.
67. Missouri State prepared me very well for a career in geology. The comprehensive major gave me a good all around knowledge of geology, but I was also able to gain experience in my chosen field of paleontology.
68. At the time of graduation I felt very qualified in comparison to my peers.
69. Better.
70. I feel that the preparation I received was equal or slightly better than the majority.
71. The preparation I received was good, but at the time the available courses for upper classmen seemed anemic. I think this was primarily due to the size of the department, though.
72. Weak in engineering. Strengths in upper division Geology courses and Field geology
73. Many of those I met had little to no field experience beyond field camp. For the most part I was typically on-par if not ahead of other geologists.
74. My undergraduate training was far superior in comparison to other geologists. I had the basic knowledge and confidence in my knowledge to succeed in the profession.
75. Very good.
76. Comparable to Superior .
77. Average.
78. Outstanding.

Question 11: What change(s) would you recommend we make to our degree requirements to enhance the quality and usefulness of our Geology program for today's students?

1. Teach Structure using today's technology. Find someone like Jim Vandike to teach intro to Hydro - he is a huge resource for Rolla.
2. Have as many as possible hands-on field trips. Also require at least 1-2 surveying classes and auto-cad classes.
3. Program excellent as is.
4. Focus towards a degree that is oriented towards problems with the environment.
5. Take advantage of the experience of local grads working professionally to advise your undergrads. Start an intern program in consulting. Increase academic rigor & relevance.
6. Communication skills a must no matter how talented or skilled a geologist. We spend most of our time trying to explain processes that we take for granted to tell laymen, politicians, city managers, etc...
7. You must include a soil mechanics or soil engineering course. Soil is part of the rock cycle & I didn't learn anything about soils until employed. A soils class would give new grads a leg up.
8. The field standards and field camp were very important.
9. The more environmental, the better in this climate, environmental consulting.
10. The Austin Peay Geology exam does not really prepare a student for geology licensure. I would encourage MSU to pursue and encourage students to begin licensure activities & prep for the real world and take the ASBOG fundamental test Sr. yr or soon thereafter.
11. Each year, run students thru a field study locally to prepare them for field geology class, which is the pinnacle for all their studies at MSU.
12. There should be more emphasis on basic instrumentation.
13. Computer programming languages may not be the most used but certainly keeping up-to-date with certain technologies that may be required for every level job.
14. As a recruiter & hiring manager I place strong emphasis on a communication and analytic skills. It is unlikely any undergraduate ever has enough writing experience & Math skills.
15. More required in-field programs. Geology cannot be learned in the classroom alone!!
16. I would suggest the creation of a few more options for those when math is a challenge. I feel I would have really benefitted from geohydrology - bud did not meet the calc 2 pre-req.
17. More petroleum geology classes. Studies on specific basins & log reading classes.
18. GIS - Geophysics - Petroleum - Math - Physics - Computer analysis
19. Change some focus to environmental consulting. There are far more jobs in this field than as a traditional geologist.
20. Encourage more students to pursue comprehensive geology program option.
21. Introduce the GIS program and make it mandatory. Extensive use of GIS software. Also the school should help with internships for the students.
22. Seismic data processing using a UNIX or Linux system.
23. GIS use is a must today. Higher emphasis on rocks and minerals. Also should emphasize more on environmental geology courses and various states regulatory issues.
24. More emphasis in paleo environments, paleoclimates, and oceanography.
25. Follow the core curriculum as set forth by the American Institute of Professional Geologists.
26. Inclusion of spatial analysis/spatial statistics.
27. A strong course in environmental geology.
28. An expanded graduate program .
29. Increased report writing skills.
30. Increased GIS & Computer training.
31. Offer more engineering related courses to enhance the usefulness of the degree.
32. I would like to see a greater emphasis on Engineering and Environmental Geology. I feel that Geophysics should become a part of the core curriculum for anyone seeking a B.S. in Geology.

33. Offer some of the specialized courses - Petroleum Geo, Tectonics, Geo-Hydro, Geophysics, Engineering, etc maybe once every other or 3rd year. As long as a student has the opportunity to take one more classes before they graduate. No need to offer them every year.
34. From a Petroleum perspective, processing and interpreting 3D &4D seismic is major part of the exploration process. G&G people with this expertise are in demand.
35. Less emphasis on difficult theoretical courses that teach knowledge computers do for us today i.e. calculus, more emphasis on cutting edge software equipment, satellite imagery, etc. Practical workplace knowledge & experience.
36. Less math & Physics more GIS, Air photo, interns.
37. Add Project Management and/or business skills courses training graduates how to plan & organize projects, deal with clients.
38. Require Stat classes, more computer programming classes that relate to Geology & GIS. Instead of a computer programming requirement and database course would be more useful.
39. Professional writing courses to be required. Oral presentation skills should be taught. Research techniques expanded.
40. I recommend an internship type program that was not available back in the 1970's. This could guide a student in course selection.
41. I still believe the BS degree should be general - graduate school is a MUST and assistantships for good students abound.
42. Need stronger engagement and outreach to industry, specifically the mining & petroleum industries.
43. Courses in well logging and CAD would be very useful to anyone interested in working as a geologist in mining geotechnical or environmental.
44. Make sure they are prepared to enter a graduate program; I think an MS or PhD is essential.
45. When I was a working person in the field, I lived Geochemical Techniques every day. Put more in this class.
46. Statistics/statistical analysis is used daily in the environmental field. A solid grounding in statistics would be helpful. This has been the sole gap in my education.
47. I believe you need to make a concerted effort to work with city, state and federal government agencies, as well as private industry, to establish a method for students to communicate with these entities to try to work with them during semester breaks or over the summer.
48. For graduate students, I think a course offered in advanced geochemical techniques would be advantageous. Any experience (hands on) with instruments will be a great advantage.
49. If environmental is an option then chemistry would be good. Environmental practices course, etc. Polices. All of the geologists that I have met in the past 20 years are in environmental fields.
50. Overall the biggest weakness I noted about my MSU education was a lack of overall education. There needs (maybe is by now) a greater emphasis on humanities (language, philosophy, etc).
51. You should consider adding some type of Environmental minor; it would be extremely useful in the workplace. Also, more soils classes would be useful.
52. Perhaps give college course credit and promote summer internships with companies.
53. Keep the field trips. More hands-on classes.
54. I'm not sure what the current degree requirements are. However, I would recommend at least one year of college-level chemistry; at least one year of college-level physics; at least second semester calculus; and an introduction to GIS, for all Geology Majors. Depending on which field of geology the student is interested in, I would recommend additional courses, for example: for Hydrology I would recommend geohydrology. Four semesters of calculus, and computer programming for ground water modeling.
55. Emphasis on computer programming and software.
56. Basic skills: Foundational sciences are key (chemistry, physics, biology). More and more emphasis is place on computer supported interpretation. Thus some value in getting a good grounding in basic computer applications. But would always error towards paper interpretation

first. Working the problem on paper teaching thinking skills. Too much automation has resulted in staff "turning off their brain". Learn to do it manually first...link the observations and thinking into a personal analog database...then utilize the computer to help drive efficiency and effectiveness.

57. Increase the amount of Petroleum and mining geology covered as well as hydrology.
58. No real change, but continue to maintain the strong comprehensive major giving students a solid education to build upon.
59. None.
60. I think geophysics & optical mineralogy/petrography should be required for all students instead of electives.
61. Those who entertain any notion of going on to graduate school should have 1 year of calculus - based physics and an additional upper-level math course beyond calculus II.
62. Add geotechnical Investigations/Soils classifications/environmental investigations/remediation/environmental law.
63. Unless things have changed since I attended, geohydrology and engineering geology should be required. Possibly a class on environmental geology as well.
64. GIS, Statistics, computer programming, computer modeling, geohydrology.
65. All the background you can give the students in engineering geology, environmental applications and ground water.
66. I would recommend putting emphasis on structural/stratigraphic interpretation as well as intros to geosciences software such as Petrel or Linus based systems.
67. Hydrology, biology, org. chem. & environmental geology; just as food for thought - future majors will have less employment opportunities in economic exploration (oil & prec. Metals)

Question 12: What change(s) would you recommend we make to the content or emphasis of specific Geology courses to enhance their quality and usefulness for today's students?

1. Change the curriculum in mineralogy to better prepare students for petrology. Do not focus on karst in engineering geology.
2. Try to make the lab experiences more like what would be at a job situation.
3. Stop making your courses easier, in general. Increase writing assignments. Make part of each class more relevant to current professional practices.
4. Environmental applications are becoming the geology field.
5. Applications of what structural geology/air-photo/mineralogy/petrology ... etc. Can be applied to different career paths in the geology field.
6. Emphasis on presentations and speaking before your peers. Example: We had to present our prospects to investors which I was not prepared for.
7. More emphasis on remote sensing & G.I.S.
8. After majors have been identified it might be useful to give more leeway if that student wants to focus on one career path. Some may want more GIS, Biology, Chemistry, Math, Business than others.
9. Solid hard-hitting basic courses are essential. They should integrate writing & presentation skills. The students must be prepared for graduate school. A M.S. degree is now the minimum.
10. More use of pc/workstation - driven coursework. Whether in the field, office, or lab, today's geoscientists are using computers at every turn.
11. Add a vocational lab to each course with laboratory sections where applicable. Identifying rocks and minerals is much easier with a nice hard sample as opposed to a handful of gravel collected from the drill-rig.
12. Guest lecturers from industry - especially those from (S)MSU. Volunteer work - work with other universities on joint projects.

13. Some focus on environmental reporting non-technical.
14. Offer advanced Env. GLG sub-program to prepare students for certification.
15. Any type of computer software that the industry uses should be used in college.
16. UNIX.
17. Less theory more field work.
18. More environmental geology courses.
19. Field trips and labs. When a student can see and touch the geology I think they become connected to the subject matter. They get excited about their field. Faculty mentoring helps too.
20. Biofuels.
21. Stay with the core information. Because MSU Geology professors teach/emphasize core geology. It better prepares the students.
22. If Dr. Plymate is still lecturing, tell Tom to slow down your speaking rate.
23. Include more field trips & other out-of-classroom activity that would enable the students to understand beyond the theory of each courses.
24. A 400-level Environmental Geology course that included containment chemistry and transport, and an introduction to risk assessment would be a plus. More field work, perhaps in cooperation with the USGS or similar entities.
25. How to use skills in geology, basic field methods and GIS & Air photo.
26. Emphasize broad-based training in geology and development of problem-solving skills.
27. Stop only using graph paper on labs. Use computers more often to generate and display findings.
28. In my current field a computer based mapping course would have been useful. Perhaps integrating that with the air photo course would work, Arc GIS is widely used for this (as you probably know).
29. I think MO State does a good job at general geology course work. Many students will have job offers which emphasize an elective not taken.
30. More technical writing courses. More geology courses w/direct application to industry needs i.e. Petroleum, environmental, mining: logging, seismic, mapping, hydrogeology, x-section development.
31. GIS (MORE) Studies with ecology.
32. Make sure the full calculus suite differential equation, physics, and chemistry are requisites. I had to take these classes after graduation to get into grad school.
33. Stress water quality.
34. Ensure they have a strong background for the environmental field and knowledge of hydrogeology. Knowledge of Federal Laws for the EPA and BLM is very helpful. A strong background in energy (e.g. oil & gas exploration and coal mining) should be an area where there will be a need for in the foreseeable future.
35. Geology is a good background for doing environmental work. With minor changes you would graduate environmental geologist that move into site investigation work, analyzing environment and geologic hazards.
36. I would make geophysics a requirement. Have a field course dedicated to rock coring & logging, soil i.d., well installation, environmental sampling techniques & lab analysis.
37. Continue to teach strong fundamentals. Well prepared student may then choose any number of Geol. related career paths.
38. Not sure what classes are offered now. But for students heading towards the environmental area, some classes in that area would be helpful.
39. I would recommend more practical application. Perhaps at the end of the semester having employed geologists speak about what they do and how they utilize the content of the course. For example, for Environmental Geology, monitoring well design and sampling data interpretation and remediation design. For Engineering Geology, maybe landfill design and construction.

40. The graduates we see today entering the industry don't appear to be as well grounded in the basics as I believe we were. Petroleum Exploration Geology is becoming increasingly difficult as the easy to find HC's have already been exploited. Deeper plays, more complex structural terrains etc... are now the norm. Simple geophysical approaches (seismic bright spots) are now a thing of the past. As a result, an even greater emphasis is being placed on solid integration of sub-discipline contributions. I like to describe it as forensic geology whereby you are required to link together circumstantial evidence and partial clues to put a subsurface story into place. Therefore, early training towards developing integration skills (linking pieces of the puzzle together) is key. Historical geology is an important class as is structural geology and geomorphology. Global tectonics (esp. as it pertains to plate interactions and resulting structural styles - EOD's is a key as well. Any field based courses is absolutely critical. There is a critical lack of field-based geologists entering into industry as more and more graduate universities are focusing on specialty topics. Some of the most outstanding petro geologists I've worked with at Shell did graduate studies in field based mapping ... we just can't find enough of these types any more (guess not as glamorous). Lastly, high quality sequence stratigraphers are always in short supply.
41. Make hydrogeology course available to go along w/hydrology.
42. Focus on the passion of the professors! I was an undecided business major and got hooked by the professors such as Castillon, Chrissinger, Miller, Plymate, etc...
43. Less map work and more hands-on labs in the introductory course.
44. More of an emphasis in the oil & gas industry.
45. My suggestions would include a firm base of remote sensing, signal processing and GIS, while not forgetting optical pet/min and structural geology.
46. Soils classification.
47. Increased Petrology Stats.
48. Three-point problem - ground water elevation Gint software program (drilling log)
49. As long as classes are taught with some emphasis regarding its usefulness as a professional geologist, I saw little that would require changing regarding the classes I took.
50. I could have used more Ore Deposit Geology.
51. GIS should include image processing - projections/coordinate systems - DEM creation - blending of faster data.
52. Updates to structural geology (not much hand calculation these days) including modern applications of geophysical interpretations of structure. I think a preface to the actual course work would be a synopsis of how the content to be learned is used by geologists in the private sector, even if it's basically a stepping stone to higher classes.
53. Environmental Geology will become increasingly important in our overburdened global ecosystems.