What Education Qualifies One as a Geologist?

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Introduction

Does an applicant for AIPG Certification need a degree in geology or is completion of the required amount of appropriate course work sufficient to meet the education requirement? This issue comes up periodically before the Section and National Screening Committees and problematic cases are passed on to the Executive Committee for their consideration. The question also applies to government licensing and other peer-review certification programs, both in the US and internationally. Because the earth science profession and degree requirements at colleges and universities and the contents of courses change over time, it is time to re-examine the education requirements for AIPG certification, something that should be done every few years.

This article began as one of the topics in the “Professional Ethics & Practices” column. An early draft was sent to the Ethics Committee for comments and the listed co-authors responded. The length of the discussion and its importance to AIPG as a whole prompted conversion into the separate article you are reading, although its style remains that of the PE&P column.

AIPG’s Education Requirement

The AIPG’s Bylaws’ Section 2.3.1 (1) contains the education requirement for certification and states, “a baccalaureate or higher degree in a geological science, and a minimum of thirty-six semester hours or fifty-four quarter hours in geological sciences as recognized and approved by the Executive Committee; and at the discretion of the Executive Committee; acceptable continuing education to demonstrate a currency with technical, regulatory, and economic factors affecting the profession.” The last clause allows, or at least has been consistently interpreted to allow, the Executive Committee to override the specified requirements in cases of otherwise deserving applicants, a right that has been exercised in appropriate cases in the past.

Discussion of the Need for a Degree

John Howard expressed the following opinion in answer to this question, “Where the applicant does have sufficient hours to qualify for a degree in Geology or Geoscience, but does not have a degree, the applicant violates the membership requirements of our bylaws. Understandably, this is a technicality, but we cannot and should not begin to make exceptions of this sort on our membership requirements. I have been a member of the Missouri Geology Registration Board since 1998 and have seen many similar cases. To date, we have not granted a license in MO for having a similar situation, simply because the Missouri statute, like the AIPG bylaws says that the applicant must have both the minimum hours of geological science and a degree in geology/geological sciences. To make exceptions of this magnitude would open the door for anyone who has the bare minimum of geologic course work and a degree other than geological sciences to presume that they can be qualified for licensure and/or certification by the Institute. You must ask yourself the following question; ‘Does a degree in environmental science with 36 hours of geology make someone proficient enough in geology to warrant the title CPG?’

“Secondly, I have to ask myself, if an applicant could not receive a degree in geology from [a named] university2, why did he/she pursue the course of study? It seems to be a gross error on his/her part to not seek a degree from an institution that would confer on him/her a degree rather than simply credit him/her with the hours only. Finally, I would agree with the National Screening Board Member’s assessment that his behavior in calling himself a geologist may border on unethical. As we saw in our recent interaction and dealings with the Arizona Geology Board, even those of us who have degrees come under scrutiny and are in violation of state licensure laws. I recommend that we deny the applicant CPG status on the basis of lack of educational experience and recommend that he pursue a formal degree in geology. My Asst. Attorney General for the Missouri board would tell me that it isn’t our job to make a suggestion to him for why we are denying him the certification/license, however, to be truly professional about the matter, I think we do owe the applicant more than the standard denial letter.”

Other members of the Executive Committee believe that meeting the course requirements set out in the CPG requirements is sufficient for meeting the education requirement, that a degree in the geosciences is not required, and thus voted to certify the applicant in question. What do you think? Should a degree in the geosciences be required in addition to the minimum course requirements? If so, must the degree major be “geology,” and/or “earth science,” and/or “earth and environmental sciences,” or what? Does a Bachelor of Arts degree in geology qualify, or is a Bachelor of Science degree required? Personally, my undergraduate degree is an Artium Baccalaurei in earth science, because the AB was the only undergraduate degree offered.

Fred Fox replied, “In the Fox Tradition, it’s simple. One must have both the degree and the credit hours,

1. This discussion is focused solely on the education requirement for certification and not on the equally important experience requirement, which present the Screening Committees and Executive Committee with its own problems.

2. In the particular case Howard was commenting on, the university in question has a policy against awarding multiple degrees of the same type, such as a BS, degree even where the requirements for multiple majors have been met. A statement from the university confirming this policy was included with the application being considered.
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as well as the experience. I know lots of (well, several) engineers who like to play geologist, and they’re sad cases. (I, on the other hand, who am qualified to play engineer because I ‘were one’ make a lousy engineer—geologists think differently.) AIPG tried once before to soften the requirements, and I quit in protest. It’s not a good idea to make it easier. In fact, I’m in favor for making it tougher, in spite of the fact that I probably couldn’t pass the tests at this point in life. It’s OK being a grandfather when you in fact are one. The stuff that I know can’t be taught—it has to be experienced.

“Further, an Ed.D. is not the same as a Ph.D in a given science. Gotta have the credits and experience, no matter how many degrees you have. My MBA does not make me a better scientist, although many degrees you have. My MBA does credits and experience, no matter how a Ph.D in a given science. Gotta have the...
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be done on an individual basis using all of these tools. After all, there are plenty of people out there with ‘real’ geology degrees who should not be trusted with a rock hammer let alone with someone’s health and safety.”

Ron Yarbrough replied to Davis’ comments with the following, “Dr. Davis, I read your message. I agree with most of it—except—today most Geography (earth description, not earth study) Departments in the USA have few physical geography courses like those in Europe. I came from an old Geology-Geography Dept. The head of the Geography section was a geologist, thus, we had a strong physical geography program, but that was 40 years ago. My Earth Science Department, at Southern Illinois University-Edwardsville, was made up of geographers and earth science (geology, soil science, meteorology, space science). The geographers had to take only one physical geography course (I taught it for 30 years). The new geography departments, in the main, teach—economic geography, urban geography, regional geography, and social geography. As you might guess, we did not get along well! I gave up on the American Association of Geographers many years ago because their publication had few articles that I was interested in. I also taught geomorphology and I had few students from the geography section of my dept. These discussion should assist our AIPG to make some value judgments as to whom we accept in our organization.”

Ted Wilton commented as follows, “I feel that there is merit in the discussions of John Howard, Fred Fox, Michael Ruddy, Ron Yarbrough, and Larry Davis. Each has brought some worthwhile points to the discussion. I am in particular agreement with Larry Davis’ comments, and what I interpret as the underlying theme in his contribution—evaluate the educational foundation of the applicant, evaluate the experience and competence of the application, and evaluate the ethical performance of the applicant before judging if he/she is qualified to be a CPG.”

“In summary, I urge some caution in disqualifying candidates automatically because the degree does not immediately say ‘Bachelor of Science (or Arts) in Geology’. Look at the foundation course work, and the experience. If the individual meets that test, his/her sponsors attest to technical proficiency and skill then they should be considered for Certification. And, if they in fact meet those criteria, I do not believe that they are unethical in claiming to be geologists.”

Perry Rahn contributed the following observations, “I’m having trouble coming up with a strong opinion one way or the other concerning course work requirements. Let me present 3 points to consider (from my own personal experience):

(1) We had an excellent mineralogist in our department who had no formal training in geology. I don’t think he ever had a college course in geology. Yet he taught himself about minerals and became an world renown expert. He co-authored a book, Encyclopedia of Mineralogy. The administration at my school refused to recognize him because he had no degrees. He never became ‘assistant professor.’ This whole episode makes me think that calling yourself a geologist, mineralogist (or even a physicist or chemist for that matter) is not because you have taken certain courses in college.

(2) The engineering profession has a different view of things. The National Society of Professional Engineers has a rigid procedure in order to become a ‘Professional Engineer.’ To become a PE you must first be enrolled in a college engineering program (subject to state_by_state rulings), and then pass a very rigorous exam called ‘Fundamentals of Engineering.’ Later, after working a number of years, your must pass the PE exam. Then you can become a PE. (Note: as I recall only about 10% of USA engineering graduates actually become PEs.)

(3) A trial lawyer may line a geologist up as an expert witness. The opposing lawyer will critically examine his credentials prior to his being allowed to testify. Most courts would not recognize a person posing as a geologist if he had inappropriate credentials.”

Rahn’s observations make a couple of important points. First, a lot of licensing requirements are based on the requirements for engineers and similar professions. Originally, graduation from an accredited school was all that was needed, or one could learn by doing. The exams were developed to deal with both the multiplication of schools and variations in curricula and with those who learned through experience. The second
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point is the voire dire examination of proposed expert witnesses. While not a perfect system, it is designed to allow expert testimony only by those with appropriate qualifications and experience, which may or may not involve degrees, etc.—being a CPG never hurts when you are answering the questions.

What Next?

The foregoing discussion makes clear that there are strong feelings about the need for a degree as part of the education requirement for certification or licensing. No one has addressed the number of hours required but whether a degree is required and its title clearly matter to some. As the discussions point out, the title of a degree can present problems. Personally, I believe that not only should the number of required semester or quarter hours be part of the education requirement, but that a list of basic required courses or topics should be included as well, courses such as mineralogy, structure, stratigraphy, field geology, etc. AIPG published a pamphlet, Education for Professional Practice (1991), that describes the basic course work in the geosciences and other subjects providing the fundamental foundation for a successful geoscience practice. Yet such course specification, which the Screening Committee looks for in examining an applicant’s transcript can present problems. What is covered in a particular course? The physical and historical geology courses that most of us took no longer covers what they once did in order to include more earth systems and environmental topics. The result is, I am told by my faculty friends, is that a number of topics previously covered in physical geology now have to be covered in the 200 and 300 level courses, which necessarily reduces the amount of time devoted to topics formerly covered in these courses. Ron Yarbrough’s and Larry Davis’ comments provide relevant examples. Then there is the old debate over whose field course is good and whose is not. During my first year of graduate work at the Colorado School of Mines, this issue was resolved (at the time, 1972) by requiring all graduate

students, including those who had taken field geology at CSM as undergraduates, to take a 3-week graduate field geology course. What about courses in the use of geoscience-related computer programs: drafting, modeling, geostatistics, etc.?

PE&P column 22 (Sept. ’97) reported a related observation that was made by Seena Hoose of the California Board of Registration for Geologists & Geophysicists who presented a poster at the 1997 Ethics in the Geosciences conference documenting the declining pass rate on California’s exam over the years. Hoose attributed the decline to lack of basic training in geology on the basis of examination of the transcripts submitted with applications. She described an increasing number of “geobasket weaving” degrees whose holders lacked basic field, structure, mineralogy, stratigraphy, and similar training. Such courses are so fundamental to all fields of geologic practice.

When I was an undergraduate at Dartmouth College in the late 1960s, an Earth Science major would be awarded to anyone who completed 4 upper level earth science courses and 4 additional upper level science courses that made sense for the student’s career plans. One classmate was a pre-med student who was interested in earth science but did not intend to pursue a career in the field. Although he has an earth science degree from a recognized institute, he does not meet AIPG’s education requirement. Those of us who were planning a geologic career exceeded the minimum major requirements by taking far more upper level earth science courses in addition to upper level math, chemistry, and physics courses. And most of us went on to graduate school. Clearly, having a degree with a geoscience major is not sufficient to meet the education requirement. Also, I would suspect that most CPGs have far more than the minimum number of required hours. While there must be a minimum requirement, those who barely meet it may encounter concerns about the coverage of their courses during Screening Committee review.

This is an important topic—what should the education requirements for AIPG certification be and how do we specify them in the Bylaws and the application forms. Should Section 2.3.1 (1) of the Bylaws be changed, and if so, in what way? Should Education for Professional Practice or an updated version thereof be cited as a guide to the required education requirement? Please contribute your thoughts to David Abbott, damgeo@msn.com, for possible inclusion in future PE&P columns. While the AIPG Executive Committee will make the ultimate decision, President Font appointed a committee to study the issue and make recommendations headed by Bob Corbett. If you are interested in serving on such committee, please contact Bob Corbett, rcorbett@ilstu@edu.

Finally, as noted in the introduction and by John Howard’s comments at the beginning of the article, the question of degree and/or course work also applies to government licensing agencies and other peer-review certifying organizations. The question extends beyond the US as professional credentials from designated organizations increasingly become requirements of international practice. AIPG Certification is now recognized in Canada (National Instruments 49-101 and 51-101), Australia, and AIPG is a vetting organization for the European Geologist title. Your comments are needed.

About the authors

David Abbott is a consulting geologist, the current AIPG National Secretary, Chairman of AIPG’s Ethics Committee, and compiler of the “Professional Ethics & Practices” column. John Howard is a consulting geologist, was a member of AIPG’s 2004 Executive Committee, and a member of the Missouri Geology Registration Board. Larry Davis, an active professor, Fred Fox, a retired consulting geologist, Mike Ruddy, an active consulting geologist, Ted Wilton, a mining company geologist, and Ron Yarbrough, a professor emeritus, are all active members of the Ethics Committee. All are CPGs.

3 Education for Professional Practice is available for free under publications at http://www.aipg.org/StaticContent/anonymous/Pubs/listofpubs.htm#Education%20for%20Professional%20Practice, accessed 01/14/05. Bob Corbett, chairman of the committee responsible for this pamphlet, told me that the committee specifically avoided recommending a “cookie cutter” course list because of varying contents of a course between schools and over time within the same school.

4 For those interested, I have my father’s exam review questions for the Historical Geology class he took at the University of Nebraska in 1936, which reveal significant differences in the covered topics (and answers to some questions) between then and now. For example, the most important economic products of each geological period were part of the syllabus; one such question was, “Tell of the climate, life, and economic products of the Mississippian.” Let me know if you would like a copy.

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