

Memorandum

DATE: May 12, 2020

TO: Dr. Daniel White, UAF Chancellor
Dr. Anupma Prakash, UAF Provost & Executive Vice Provost

FROM: William Schnabel, CEM Dean

RE: Response to Letters of Opposition to GE Restructure

Per the Board of Regents request and your subsequent charge, I convened a task force to develop a detailed plan outlining the focus areas and draft curriculum for the BS and MS programs in geological engineering. That plan was developed from the ground up, employing the programmatic accreditation (ABET) requirements as a starting point. The plan also included a draft curriculum for the civil engineering program, as we intend to house the individually-accredited GE program and the individually-accredited CE program in a shared department, and leverage some degree of common teaching resources between the two programs. However, each program would be distinctly different, and maintain its own identity and accreditation. The task force included a senior member of GE, a senior member of CE, and an associate dean charged with overseeing the ABET accreditation efforts for all of CEM's programs.

The plan is well-considered, and as you noted in your letter to the Alaska Miners Association, represents a creative solution developed for the purpose of sustaining UAF's support for the resource development industry. By leveraging resources to teach some fraction of shared curricular material between geological and civil engineering, we can recommit the resources we need to maintain an accredited mining program. Whereas our own history clearly demonstrates that we can support an accredited geological engineering program with two faculty members – especially with the added support from civil, mining, and geology faculty – I do not believe that we could maintain an accredited mining program with only two faculty members. Mining is too dissimilar from the other disciplines for that. However, beginning in FY21, we have only two permanent mining engineering faculty members, and no resources to hire more.

As you know, the BoR Academic and Student Affairs committee will discuss and possibly vote on the GE restructure plan on Wednesday, May 13th. In recent days, I have seen various letters addressed to the committee members voicing opposition to the restructure plan. Unfortunately, many of the arguments detailed in those letters appeared to be based upon incomplete information. While I commend the letter writers on the level of support voiced for the programs in question, I feel compelled to write this response in order to provide the BoR with a more complete picture. I will address some of the common themes that appeared in those letters as individual bullet points:

- **Impact to the Resource Industries and State Revenue:** Only 15% of UAF's GE graduates actually take jobs in the mining and oil & gas industries. The majority of our graduates do geotechnical work for consulting firms or state agencies, and support industry in that fashion. That geotechnical work is more closely aligned with civil engineering compared to mining engineering, thus we can leverage a higher fraction of resources by sharing expertise between those programs. Nonetheless, GE students in the restructured plan will retain the option to focus their technical electives towards mining or oil & gas, thus maintaining support for the GE program to supply Alaska with trained engineering graduates specifically tailored to the resource development industries.
- **Coverage of Geology:** All agree that a geological engineering degree is founded upon a robust coverage of geology. The restructured GE plan has the same requirement for the same geology courses as does the existing GE curriculum. The geology component will be unchanged in the restructured program. Instead, savings are obtained by leveraging shared topics. For example, CEM does not need to provide a groundwater hydrology course for geological engineers as well as a separate groundwater hydrology course for civil engineers. One broader course will be sufficient for both disciplines. Indeed, broadening the scope of such courses to include material and examples relevant to more than one discipline will enhance the education we deliver to students in both programs. Interdisciplinarity is key in modern engineering practice, and increased interdisciplinarity is a strength of the proposed restructure plan.
- **Outreach Attempts:** This proposal is the result of months of interaction between UAF and the mineral extraction industry. Indeed, it represents a viable alternative to my original recommendation to discontinue the geological engineering program – a recommendation that was loudly decried by industry stakeholders. In my original proposal, the civil engineering program would provide a few relevant courses in order to allow civil engineers to focus on some of the issues relevant to geological engineers. In this current proposal, we detail the actions necessary to maintain a full-fledged, individually-accredited geological engineering program housed in a department shared with civil engineering. This is accomplished by focusing the efforts of two credentialed geological engineers upon teaching courses that are specifically required by geological engineers, and utilizing faculty from other disciplines to teach the topics that are more broadly applicable. Industry stakeholder input informing the proposed curriculum was invited and received through a broadly-distributed stakeholder survey. GE student exit interviews collected throughout the past decade were reviewed and taken into account. All faculty in CE and GE were invited to provide feedback to the draft proposal. Upon adoption of the restructure, all faculty associated with GE and CE will be expected to work through normal faculty senate channels to further refine and implement the curricular details.
- **Task Force Credentials:** The task force was small due to time constraints, and interdisciplinary due to the nature of the charge. The plan required discipline-specific knowledge of geological engineering, civil engineering, and a strong foundational understanding of the ABET accreditation process. The task force consisted of Margaret Darrow, Dave Barnes, and Charlie Mayer. Dr. Darrow is the most recent member of that program to serve as department chair, and is the only member of geological engineering who maintains a professional engineering license. While Dr. Darrow's academic credentials include geological engineering, she is licensed as a civil engineer because the State of Alaska does not issue a discipline-specific license for geological engineers. Dr. Barnes served as a long-time chair of civil engineering, and is licensed as a civil engineer. Dr. Mayer is an electrical engineer and a long-time associate dean for academics at CEM. Dr. Mayer's associate dean

duties include oversight of the ABET accreditation efforts college-wide, in addition to assisting with development and oversight of academic curriculum. In my role as dean, I have not only the credentials, but also the responsibility to play an active role in the curriculum development as well the ABET accreditation processes throughout the college.

- **“Watered Down” Curriculum:** Several letters described the proposed plan as a “watered down” curriculum. That characterization is inaccurate. While the GE curriculum is proposed to be reduced to 126 credit hours from the current 133 credit hours, I have also directed every other program in CEM to seek ways to reduce the credit requirements for their degrees. Thus, the GE program will ultimately reduce its required credit hours regardless of whether or not the restructure occurs. This movement is in keeping with the universal need to reduce the number of credit hours required for all engineering degrees. The ABET-mandated minimum is 120 credit hours. Moreover, UAF has more contact time per credit hour than most engineering colleges due to UAF’s 60-minute contact hour, compared to the 50-minute contact hours at most other institutions. Not only will the restructured GE program be above the ABET-mandated minimum, but also UAF’s credit hours themselves represent more class time compared to their peers. The GE curriculum will be leaner compared to years past, as will all of CEM’s programs, yet still significantly more robust than that required by ABET.
- **Realignment with Civil Engineering:** Letter writers have pointed out that there will be no savings associated with forming a new department shared between geological engineering and civil engineering. That is true. The savings will be generated by retaining only two of four existing geological engineering faculty members. The rationale for the realignment with civil is twofold. First, the majority of our GE graduates take jobs more closely aligned with civil engineering industry activities compared to mining engineering industry activities, and thus the GE program will share more classes with CE compared to other programs in the college. Second, we believe that aligning the GE program in a shared department with CE will help maintain ABET-accreditation. Faculty members teaching material common to students in both programs can potentially be described as fractionally associated with both programs, thus allowing us to more fully represent the actual faculty effort supporting the program. The case for that fractional attribution of effort is stronger if the programs share a department.
- **ABET Accreditation:** A UAF GE emeritus faculty member noted that the GE program received ABET accreditation with two faculty members over multiple cycles in the past. ABET accreditation is based not upon which courses are offered, but instead by a list of program criteria (i.e., topics covered). Part of the accreditation process is to map those criteria to specific courses in which those criteria are met. The current restructure plan was developed by starting with our existing ABET program criteria. Stakeholder input was then incorporated regarding the needs of the state, and student input was evaluated using exist surveys. That information was used by experienced faculty members to guide which courses would be offered in the restructured plan. While there is still much work to be done on the part of programmatic faculty with respect to refining and finalizing the curriculum and specifically mapping the course material to the ABET program criteria, we are confident that this can and will be accomplished. The entire restructured program was tailored specifically to meet ABET requirements while supporting students and industry for the State of Alaska.