

## **A Tale of Two Programs: Integrating Humanities and Engineering**

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### **Introduction**

In this paper we will describe two programs at the Colorado School of Mines (CSM) which integrate the humanities and social sciences with engineering. The first, HumEn (Humanities/Engineering Integration), is a small-scale, single-course program which has been in place since 1988; the second, the McBride Honors Program in Public Affairs for Engineers, is a large-scale program involving about 10 percent of the CSM undergraduate student body and approximately 40 faculty each year; the program has been in place since 1979. We believe that both of these programs provide viable models for integrating the humanities with engineering. In our paper we will briefly describe the two programs and then discuss their strengths and weaknesses as models for integration.

### **The HumEn Program**

The HumEn (Humanities/Engineering Integration) Program was started in 1988 with help from a grant from the National Endowment for the Humanities. Its original purpose was to explore innovative methods of integrating humanities directly into existing, required undergraduate engineering courses. In HumEn courses we help engineering students make appropriate connections between the humanities and their technical work, connections that will carry over into their professional lives. Courses in the program are team-taught by a member of the engineering faculty and a member of the Liberal Arts and International Studies faculty, each an expert in his/her own field, each knowledgeable in the others'.

As the two faculty who received the funding from NEH, we have been involved in the HumEn Program since it was first taught in Spring 1989. The course has evolved over the years from a single course with a chemical engineering designation which carried 4 credits rather than the usual 3, to two separate 3-credit courses (one in chemical engineering and one in humanities which were co-requisites for each other), to a completely stand-alone three-credit humanities course that accepts students from any engineering major on campus but is not specifically aligned with any. These modifications have been the result of both changing politics and changing curriculum at CSM, but we feel that HumEn has maintained its integrity and is as strong a course now as it ever was. A list of the features that allowed us to institutionalize the course follows:

- The two of us are dedicated to the HumEn concept and to keeping the program alive. Although other faculty have occasionally taught HumEn courses, we are the champions who sustain it. Though many people view this kind of reliance on individual “champions” as a

drawback, we think our persistent efforts have made the course better over the years, and our clear vision for the program has kept it focused on its original goals.

- Our institution strongly supports educational innovation and, because CSM is small and has a history of interdisciplinary cooperation, the school did not put barriers in the way of first experimenting with and then institutionalizing HumEn.
- Students strongly support the program. Through the years the students who have participated in HumEn have indicated their satisfaction by recommending the course to their colleagues. This word of mouth advertising has assured us of a continual stream of interested, qualified HumEn participants.

### **The McBride Honors Program**

The Guy T. McBride, Jr. Honors Program in Public Affairs for Engineers is another successfully institutionalized program at CSM which took quite a different route to its current state. This program is a 27 semester-hour sequence of seminars and off-campus activities with the primary goal of providing a select number of engineering students the opportunity to cross the boundaries of their technical expertise and to gain the sensitivity to prove, project, and test the moral and social implications of their future professional judgments and activities, not only for the particular organizations with which they will be involved, but also for the nation and, indeed, the world. To achieve this goal, the program brings themes from the humanities and social sciences into the engineering curriculum that will encourage in students the habits of thought necessary for effective management and enlightened leadership.

After a rigorous application process, approximately 10 percent (50 to 55 students) of the first-year class is admitted to the McBride Program each year. Special features of the program include: small seminars, an interdisciplinary approach (faculty from engineering and science disciplines and faculty from liberal arts are co-moderators of each seminar), the opportunity for one-to-one faculty tutorials, the opportunity to practice oral and written communication skills, a Washington, D.C. public policy seminar, the opportunity for a practicum experience (either an internship or foreign study), and the development of a community within a community. This program's success has stemmed from a number of factors:

- The faculty as a whole (engineering, science, and liberal arts) strongly support the program. A strong, dedicated cadre of faculty serve as moderators in the program. Approximately 30 percent of the total CSM faculty have served at least one term on the Tutorial Committee, a four-year commitment to teaching and other involvement. Engineering and science faculty believe in the program strongly enough to volunteer their time and teach the seminars as overloads.
- The school realizes that it has a strong recruiting and retention tool in the McBride Program. It is therefore in the best interest of the institution to keep the program healthy.

- The program was endowed when CSM president emeritus Guy T. McBride retired approximately 10 years ago. The endowment funds give the program a certain amount of independence and immunity from the fickle winds of state and institutional funding.

### **Conclusion**

Clearly, the two models we present here represent polar opposites in terms of institutionalization. The common threads appear to be:

- A champion or champions in the faculty.
- Institutional support which values the importance of the humanities in an engineering context.
- High quality programs which result in student satisfaction and “word of mouth” recruiting.

### **Biographical Information**

BARBARA M. OLDS is a professor of liberal arts and international studies and principal tutor of the Guy T. McBride Honors Program at the Colorado School of Mines. She has been involved in developing and sustaining a number of interdisciplinary projects at CSM including HumEn, The McBride Honors Program, Multidisciplinary Senior Design, the EPICS program and Connections. She is currently a member of CSM’s Curriculum Revision Steering Committee.

RONALD L. MILLER is an associate professor of chemical engineering and petroleum refining at the Colorado School of Mines. He has been involved in developing and sustaining a number of interdisciplinary projects at CSM including HumEn, The McBride Honors Program, Multidisciplinary Senior Design, the EPICS program, and Connections. He is currently working with a group of faculty to develop a center for educational research at CSM.