Undergraduate Curriculum Plan for the Integration of Spoken, Written and Visual Communication in the Department of Mining and Minerals Engineering

For almost ten years, the Department of Mining and Minerals Engineering (MinE) has successfully integrated spoken, written, and visual communications into its undergraduate curriculum through the department’s Writing and Communications Program (WCP). The following report identifies the department’s goals for integrating spoken, written and visual communication into its curriculum, describes how the program is structured to meet those goals, and provides information on how student progress is monitored. Detailed information regarding specific Communications-Based MinE courses and tools for supporting communications-based courses are provided in the Appendices.

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Department of Mining and Minerals Engineering (MinE)

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I. Overview
In 1995 two Mining and Minerals Engineering (MinE) lab courses, MinE 3024 and MinE 4034, received formal designation as “writing intensive.” Over the past nine years, this effort to provide students with a discipline-specific communications-based experience has developed into the department’s current Writing & Communications Program (WCP). The WCP now aims to not only help students develop spoken and written communication skills within the MinE curriculum, but to also prepare students for the professional writing and communication demands they will encounter in industry and related professions.

Since the WCP’s inception, the number of courses integrating communications-based skills has increased to three, comprising a total of 5 credit hours. In addition, the program has expanded its focus to cover a broader range of skills, such as those needed for career planning. As a result, the current WCP within the Department of Mining and Minerals Engineering is a multi-leveled, student-centered program which emphasizes and integrates critical written, spoken and visual communication skills throughout the student’s entire academic experience.

II. Goals of the Writing & Communications Program
In order to develop students’ professional communication skills, the WCP has been structured around the following departmental goals:

• Promote an awareness of industry demands for clear writing and effective communication skills
• Develop and improve students’ writing and communications skills in preparation for both professional careers and continued academic research
• Hone students oral communication skills by providing frequent opportunities for giving professional-quality presentations
• Expose students to elements of visual design, providing opportunities to integrate it into coursework
• Support the MinE faculty through the creation and integration of writing and communication-based courses and assignments
• Provide feedback on and evaluate student communications-based assignments
• Monitor and assess improvements in communications skills among students currently in the program as well as among graduates and alumni
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III. Implementing the WCP: Multi-Leveled Approach to Communication Skills

Departmental goals for integrating communication skills are achieved by means of a multi-leveled approach to student communication. During the course of their studies, students will have the opportunity to develop and exercise a variety of communication skills at the Curricular, Professional, Departmental and Individual level.

Curricular Level

At the curricular level, students gain competency in spoken and written communication skills through three MinE courses designated to integrate such skills. In addition to the technical-knowledge content, these courses emphasize communication skills through the integration of major written, oral and visual communications-based assignments.

Communications-Based Courses

Currently, three courses, totaling 5 credit hours, are designated as Communications-Based courses: MinE 3514, Rock Mechanics Laboratory (1 credit); MinE 3544, Mineral Processing Laboratory (1 credit); and MinE 4535, Senior Design Project (3 credits). In these courses, students are required to design and present a major project which relies heavily upon written, visual and oral communication skills. Student projects are evaluated and graded for both effective communications content (WCP coordinator) as well as technical content (primary course instructor). A brief summary for each of these courses is found in Appendix A.

Communication Skills Developed

MinE 3514, MinE 3544, and MinE 4535 are designed to emphasize and develop the three major components of communication: written, spoken and visual.

- Written communication skills are developed and practiced through the actual writing of laboratory reports and feasibility studies. Since all projects are submitted in two drafts, students are encouraged to approach writing as a process rather than a product.
- Spoken communication skills are enforced primarily in the
Senior Design Project course in which students are required to
give two formal presentations per semester. Three of these
presentations are framed as project updates while the final
presentation is a complete session on each group’s proposed
mine development plan. Spoken and oral communication skills
are also emphasized in both the Rock Mechanics and Mineral
Processing laboratories in which students are required to take

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part in dynamic group activities and provide oral updates on experiments.

- Visual communication skills are emphasized and developed throughout all three courses. Written reports and presentations must adhere to strict standards of document layout and design. Students are required to develop methods for presenting visual information effectively, both at the document’s global level and through its integration of tables, figures, graphs and supplementary appendices.

Communications-based courses are administered by the primary instructor and the WCP coordinator, who supports the course using a variety of tools which are explained in detail in Appendix B.

Professional Level
The Department of Mining and Minerals Engineering has one of the most active and successful career recruiting programs at the university and generally places 100% of its graduates in challenging mining engineering fields and careers. With more than a dozen industry recruiters visiting the department each semester, MinE students have a need to develop and refine career and profession-related communication skills. To support the recruiting program and to meet the department’s goal in preparing students for professional writing and communication challenges encountered throughout their careers, the WCP has implemented an extensive professional communication and correspondence element into its program.

Workshops
Prior to the start of each year’s recruiting session, students are given a presentation and workshop on professional communication skills. These workshops cover basic areas such as effective resumes and cover letter letters as well offer strategies for conducting interviews.

Consultation
In addition to the workshop, the WCP helps develop professional communication skills through individual consultation and assistance. At any time, students may meet the WCP coordinator to get feedback and assistance on resumes, cover letters and thank you letters.

Departmental Resume Book
Not only can students have assistance if they want, each student is required to write, update and submit a resume at the start of each semester for a Departmental Undergraduate Resume CD, which is provided to the recruiters in advance.
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Departmental and Individual Level

The Department of Mining and Minerals Engineering hosts a number of active student organizations, such as the Burkhart Mining Society, and several student chapters ranging from the International Society of Explosives Engineers, to the Society for Mining, Metallurgy and Exploration, to the more recently founded Women In Mining.

In order to meet the departmental goal of promoting student awareness of professional and industry demands for clear and effective writing, the WCP assists students with organization-related correspondence. Officers and members meet with the WCP coordinator to obtain assistance and feedback in the writing of useful proposals, requests for donations, or bylaws and other official correspondence. Professional writing resources and style guides are also made available to students from the WCP resource library.

At the individual level, the WCP supports student writing skills by providing feedback and counseling on writing assignments external to the department. The WCP coordinator assists on average 5-10 students per year with elective and non-MinE related course writing assignments. The WCP has also assisted students with scholarship essays and graduate school applications.

IV. Assessing Outcomes
To ensure that the department’s goals for integrating spoken, visual and written communication into the curriculum are being met and that students’ skills have improved as a result of these goals, the WCP monitors and assesses student progress and the effectiveness of its program through the use student surveys, alumni surveys, and faculty/instructor feedback.
Student Surveys

The WCP conducts a survey among participants at the conclusion of each communications-based course. The purpose of this survey is to obtain candid student response as to how well writing and communications support was administered, what students understood and to comment on areas of weakness. A sample end-of-semester survey can be found in Appendix C.

Alumni Surveys

Every five years, the Department of Mining and Minerals Engineering, through the WCP, evaluates the effectiveness of its communications program by eliciting response and feedback through a MinE alumni survey. The purpose of the survey is to determine how the WCP has helped department graduates as well as to ascertain shortcomings in the program.
Faculty Feedback
Throughout the semesters, the WCP coordinator and the primary instructor maintain regular contact to discuss how well written, spoken and visual communications objectives are being met within a course. At the end of a course, the primary instructor and writing coordinator discuss changes to course assignments, guidelines and expectations regarding communications.
Appendix A

Summary of Mining & Minerals Engineering Communications-Based Courses

Junior Year

Rock Mechanics Laboratory (MinE 3515) is a 1-credit course offered in the fall semester of the students’ junior year. For this course, students work collaboratively in groups of three to write and submit two separate lab reports. Each lab report is approximately 30-50 pages in length and must follow a professional report format (Letter of Transmittal, Abstract, Summary of Results, correct integration of tables, figures, appendices, etc.). Each report is submitted twice as both a first and final draft, thus emphasizing the writing process. To enforce the equal importance of both technical competence and communication ability, both are graded equally (50% communications; 50% technical) for the final project grade.

Mineral Processing Laboratory (MinE 3544) is a 1-credit course offered in the spring semester of the student’s junior year. For this course, each student is required to design, write and submit a total of seven separate lab reports. Three reports are formal, approximately 10-15 pages, and are submitted in two drafts. The remaining four reports are briefer and informal, responding to specific issues involving the experiment; however, they are still evaluated for presentation, writing, and integration of tables and figures. Informal reports are approximately 3-5 pages and are submitted as a single, final draft. All seven reports produced for this course are evaluated and graded on both technical content (50%) and written/visual communication elements (50%).

Senior Year

Senior Design Project (MinE 4535), the department’s capstone student project, is offered in the student’s senior year during both the fall and spring semesters and is 3 credits. For this course, students work in groups of 2 to 3 in collaboratively researching,
designing and writing a complete business and implementation plan for a proposed mine site. The plan consists of 16 chapters, an executive summary, a conclusion, and references, and it makes extensive use of tables, figures, graphs and appendices. Eight chapters are prepared in the fall semester, the remaining 8 in the spring. Each chapter is submitted at intervals throughout the semester as a draft. Draft chapters are then assessed, given feedback and are assigned a technical and communications-based grade. At the end of the semester, the complete 8 chapters are submitted as a final draft. The writing and visual design grade makes up approximately 50% of the final project grade.
Lab/Course Report Guides. Requirements and standards for written, spoken and visual communications are tailored to each communications-based course. The WCP coordinator and primary professors collaborate on the communications objectives for each course and design a writing and communications guide for that course.

Writing Process Guidelines and Handouts. In addition to the specific Lab/Course Report Guides noted above, a series of more detailed handouts are distributed to students throughout the semester covering different aspects of the writing process and communications skills in greater depth and with more examples (i.e., organization, paragraphing, integrating figures, tense usage, visual design, etc). These are usually distributed as file attachments on the course’s Blackboard site.

Sequencing the Writing Process. The abovementioned guidelines are presented in a sequenced manner; that is, students are introduced to components of the writing process at specific phases during the semester. This encourages students to adopt, practice and integrate new writing skills at an even pace. This also allows students to be evaluated on a particular component of the writing process rather than having a paper “beat up” on all areas of writing.

Grading rubrics are used 1) to present students with expectations and criteria of written, visual, or spoken communication assignment and 2) to highlight strengths, weaknesses and/or concerns in the graded assignment. A short narrative assessment of the graded report is also provided with the rubric.

Conferences. Students or student groups are required to attend one conference with the WCP coordinator, usually between the first and final drafts of the first assignment. This provides face time between the student and the coordinator and helps address students’
communications problems individually. In addition to mandatory conferencing, students are free to meet with the WCP coordinator at any point during the semester.

Workshops. When deemed necessary or requested by the primary instructor, the writing coordinator conducts workshops during the classroom portion of the laboratory course. These sessions usually cover one or more components of the writing process, giving presentations, or visual design. Workshops are often used to address significant problems from recently graded lab reports.
Appendix C
Sample Student Survey (from MinE 3544)

• Which areas or criteria under the “Writing Grade Rubric” are unclear, not understood, or need further explanation?
• How effective/helpful is the communications feedback on drafts?
• How fair is the grading on the writing portion of your lab reports?
• How helpful are communications handouts and guidelines?
• Which topics or area of the writing process as outlined in the rubric would like your more clarification on?
• Were in-class workshops helpful?
• How accessible was the WCP program coordinator?
• What were the biggest impediments to conferencing or working with the coordinator?
• Please comment here on any other aspect of or concern regarding the communications component of the course.
March 8, 2005

Terry L. Clements
Chair, University Core Curriculum Committee

Subject: Statement on the Use of Outside Resources for ViEWS Requirement

The Department of Mining and Minerals Engineering does not use or incorporate outside resources for implementing its Visual Expression, Written and Spoken (ViEWS) communication requirement. This reflects no change to the department’s implementation of a communications-based curriculum. All resources for meeting ViEWS communication requirements are designed and administered within the department by members of the faculty and the Writing & Communications Program Coordinator.

Further questions regarding the department’s Writing & Communications Program or its implementation of the ViEWS communication requirements can be directed to the program coordinator.

Sincerely,

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