

Promoting Professionalism in Traditional and Nontraditional Ways

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Abstract

For a several years our Mechanical Engineering program has had a one semester hour senior seminar. The purpose of the class is to promote professionalism and ethical behavior as senior students transition to the professional workplace. This supports one of our program objectives. Recent assessment data suggested that the course had not really been fulfilling its stated purpose. This paper describes changes that have been made to help the course better achieve its objectives.

The first change was to bring in a number of outside speakers who could relate their real world life experiences to those of the students. On a regular basis, we now bring into our class speakers who give presentations on the following topics:

- Experiences the engineer will face early in his career (by a recent graduate).
- Experiences the engineer will face by the time he reaches mid career (by someone who has graduated 10-15 years ago).
- Financial planning by a certified financial planner.
- Intellectual property presentation by the university's director of intellectual property.

These topics were suggested by our industrial advisory board based on interviews they conduct with our students twice each academic year.

We supplement these presentations with information on a number of other professional topics. We chose to use the small ASME book: *The Unwritten Laws of Engineering*¹. This book has excellent content. The first year we had students make presentations on material taken directly from the book. Most did traditional PowerPoint presentations which were adequate in terms of material content but rather dull for the student listeners. The last two years we had the students continue to present these topics, but stated they could not just make a traditional presentation, they had to do something creative.

We received some creative presentations the first year. As students got more experienced with this approach, their creativity has really increased the second year. For example, one group presented how to relate to co-workers by making a contest patterned after the game “Family Feud”. Some members on each team presented good answers, while others presented questionable or obviously false ones. One group this year taught management principles by playing the “Managing Game”, patterned after the Dating Game television show. One student represented someone who has just inherited a family business and she questioned three potential managers as to how they would handle certain problems. To keep it entertaining, only one of the potential managers had good answers, while the other two gave incorrect and often hilarious responses.

This method of teaching serious relational and management issues through group presentations that are often based on games has proven to be very useful. The students have a great time (both performing and listening). Serious content is communicated in a way that the students will long remember.

Background of our Course

A number of years ago, the Mechanical Engineering Program at Louisiana Tech University developed a four year seminar program. All students in our program were required to take a one hour seminar course in fall quarter. In each class we introduced students to professionalism issues that were appropriate to their class level. In addition, we used these classes to introduce some personal productivity software and time management techniques. We also had a one semester hour engineering ethics course that students typically took during their junior year.

In 1998 we had a major revision of our curriculum. This was brought on, in part, by a state mandated reduction in allowed semester hours. Rather than just eliminating five courses, we decided to do a major revision to our curriculum at all levels. This resulted in the elimination of the first three seminar courses as well as the engineering ethics course. Some of the more basic content dealing with an introduction to engineering and the use of appropriate software has been moved to a new freshman engineering course sequence that all engineering students in our college must take.

These changes forced us to re-examine the content of our senior seminar course. We revised it significantly to include some ethics and professionalism topics that were in the deleted courses.

Traditional Course Content

The course content is shown in the table below. This table is based on the most recent offering of the course. In this table, the course content was been organized in a logical fashion. The

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actual schedule was different from this because we had to fit the class schedule around the schedules of our outside speakers.

This course meets once per week. It is taught in seminar style in an advanced classroom that has modern computer multimedia capabilities. We officially have a three hour time period for the class, however, we rarely require more than 75 minutes for a given week's topics. The class meets eleven times during the fall quarter. Since some topics take less than a full period, there are more than eleven topics shown in the table below. There are typically about 60 students in the class. For some of the topics, they are broken into two smaller groups of about 30 students.

Overall Topic	Subtopics
Engineering Ethics	<ul style="list-style-type: none"> • Watching, discussing, and responding to the video <i>Gilbane Gold</i> that has been produced by the N.S.P.E.² • Discussing in small groups a series of real life case studies that were presented by Dr. Jordan^{3,4}
Time and life management	<ul style="list-style-type: none"> • Presentations and discussion based on the first three habits of Stephen Covey's <i>Seven Habits of Highly Effective People</i>.⁵ • Personal financial planning presented by a Certified Financial Planner
Career management	<ul style="list-style-type: none"> • Presentation by the director of the university's placement office • Presentation by an alumnus engineer who has very recently graduated • Presentation by an alumnus engineer who has been out in practice for a number of years.
Intellectual Property	<ul style="list-style-type: none"> • Presentation and discussion led by the university's director of intellectual property
Professionalism issues	<ul style="list-style-type: none"> • Student presentations based on portions of the ASME book <i>The Unwritten Laws of Engineering</i>, revised by J.G. Skakoon.¹ <ul style="list-style-type: none"> ○ There were ten presentations spread over four class periods. ○ Class was broken into two groups for these sessions

Ethics

The *Gilbane Gold*² video was developed by the National Society of Professional Engineers (N.S.P.E.). It is an excellent fictional presentation of a real world ethical problem. There are a number of technical oriented people in the video. Some of them make clearly poor choices, but some of them face ethical issues that are not simple and force the students to think. We had the

students watch the video as a large group. They were then broken into small groups to discuss several of the people in the video, and then reported back to the entire class their conclusions.

The ethics presentation and discussion led by Dr. Jordan was based on two A.S.E.E. papers he has written^{3,4}. The cases presented all actually happened. Dr. Jordan observed these real situations while working as an engineer for a medium sized steel company in the 1980's. The cases were presented as ethical or moral dilemmas. The students had to decide upon their own responses before the professor presented what decision was made by the person involved.

Time and Life Management

The first three habits from Stephen Coveys's book *The Seven Habits of Highly Effective People*⁵ were presented on three consecutive class periods, one per period. The three habits presented were:

- Habit One: Be Proactive
- Habit Two: Begin with the End in Mind
- Habit Three: Put First Things First

Student discussion followed each presentation. The students were broken into small groups and had to decide upon courses of personal action to take as a result of their discussion.

We had a certified financial planner come in and make a presentation. This was done by someone who is an excellent and provocative speaker. He presented a number of issues that are important to new engineers. Many of them had not thought about these topics before. As a result of this seminar, the students had to individually create a personal monthly budget for how they would spend their money once they get a professional job after graduation.

Career Management

Students who take this course typically are within a few months of graduation. Therefore, how to get a good job is an important issue for them. Every year we have the director of the university's placement office come in and make a presentation. She provides them with much useful information, such as how to write a good resume, and how to conduct yourself during a job interview. The students are required to create a resume as a result of this seminar. This seminar is usually one of the first classes during fall quarter. That way the students can create a good resume in time to actually use it during the fall interviewing season.

In this topic, we have alumni come back and speak about the real world of engineering practice. While the specific speakers change from year to year, the basic goals of these presentations do not change. Each year we try to bring in a speaker who is a recent graduate who can speak of what it is like to start an engineering career. We also try to bring in a more mid-career person who can speak about what it is like to be an engineer who has been out practicing the profession for a number of years.

Intellectual Property

This topic is important to all engineers. We all use intellectual property created by others. Many of us create more intellectual property during our careers. This presentation exposes the students to issues related to copyrights, patents, and trade secrets. There is an extensive discussion about legal issues related to property. They learn how this property can be protected, and the risks involved if they or someone at their company uses someone else's property illegally.

Nontraditional Course Content

We have had student group presentations during this seminar ever since it was started in the 1980's. The topics have changed over the years. Several years ago it became apparent from assessment data that the topics being used did not meet the students' real needs. Based on the assessment data and feedback that our Industrial Advisory Board received from their interviews with students, we made significant modifications in the presentation topics. We have decided to use topics based on the excellent small book, *The Unwritten Laws of Engineering*¹. By having students make presentations, we accomplish two goals: they more effectively learn the content of the book, and they improve their group presentation skills.

The topics for this are shown in the table below. For these presentations, we break the class into two smaller sections. Within each smaller section, there are five groups of students. Each group had about six members. The students are to make a thirty minute group presentation about their topic.

Table 1	
Student Presentation Topics	
Group Number	Topics
1	<ul style="list-style-type: none"> • What the beginner needs to learn at once in relationship to the work • What the beginner needs to learn at once in relation to your supervisor
2	<ul style="list-style-type: none"> • What the beginner needs to learn at once regarding relationships with colleagues and outsider • Relating chiefly to engineering managers: individual behavior and technique
3	<ul style="list-style-type: none"> • Relating chiefly to engineering managers: managing design and development projects • Relating chiefly to engineering managers: on organizational structures
4	<ul style="list-style-type: none"> • Relating chiefly to engineering managers: what all managers owe their employees • Professional and personal considerations: laws of personal character and personality
5	<ul style="list-style-type: none"> • Professional and personal considerations: regarding behavior in the workplace • Professional and personal considerations: regarding career and personal development

The first year we used these topics, the students all made relatively traditional PowerPoint presentations. While there was solid content there, most of them were rather boring. The past two years we have changed their presentation requirement. While they are still allowed to use presentation software, they are not allowed to just stand up and make a traditional presentation. They had to show some creativity in what they are doing.

We received some creative presentations the first year. As students got more experienced with this approach, their creativity has really increased the second year. Quiz show themes became the most popular format. For example, one group presented how to relate to co-workers by making a contest patterned after the game "Family Feud". Some members on each team presented good answers, while others presented questionable or obviously false ones.

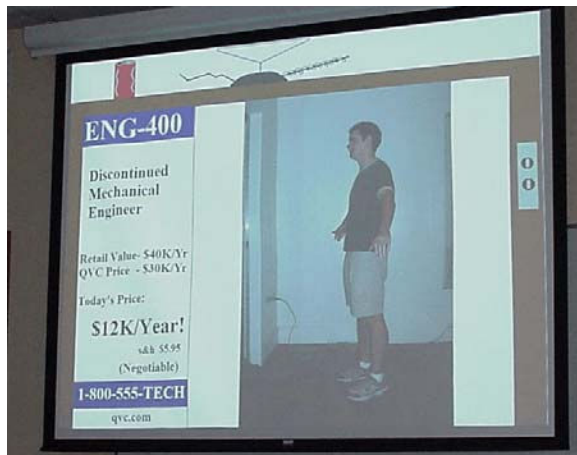
Skits and mini-dramas are another popular format. One group had a business meeting as their skit. They did it two ways, giving a funny example of a disastrously poorly run meeting, where

the people did not get along and treated each other unprofessionally. The followed it with an example of a well run meeting.

Another group did a skit that was modeled after the Jerry Springer show. Guests came on the show who were supposedly engineers working in the same group. They interacted poorly, showing us what not to do. From time to time there was interruption by the host, who demonstrated what should have been done. This group also created humorous fake engineering oriented commercials as breaks during the show. One of them was for a fake engineering handbook that had the two professors for the course's names as co-writers.

One group this year taught management principles by playing the "Managing Game", patterned after the Dating Game television show. One student represented someone who has just inherited a family business and she questioned three potential managers as to how they would handle certain problems. To keep it entertaining, only one of the potential managers had good answers, while the other two gave incorrect and often hilarious responses.

One team presented their material as a series of live and multimedia television programs that one of the team members viewed as he spent the evening "channel surfing" instead of studying as shown in the photographs below.



Unlike most seminar presentations, the students enjoyed listening to them. They also appeared to enjoy creating and performing in them.

Grading for this assignment had two components. One half of each group's grade was the average grade received from their peers. Students were given a rubric to use so that each one was done using the same basic criteria. One half of each group's grade was the professor's grade, done using the same rubric.

Assessment of Revised Course

We conducted anonymous student surveys at the end of the course. We asked a number of open ended questions about the class. As can be seen in the table below, the response to the creative way of teaching the professionalism content was overwhelming positive.

<p>What is the reaction to the untraditional way we had you make the oral presentations?</p>	<p>90% made positive comments 7% made neutral comments 3% made negative comments</p>
<p>Positive Comments by Students (a selection)</p> <ul style="list-style-type: none"> ● Fun, made for some exciting classes ● It was fun to do and watch. I think it's a wonderful idea ● I like it this way, allows one to think outside the engineering box ● Fun ● Good, interesting ● A lot better than regular presentations ● Tough to organize, more entertaining ● Cool ● It was fun and made it less painful ● Lots better than formal ● I really liked it, it's really a good change. It makes you think and actually get together and do some work for a presentation ● I liked it! ● Much better, it kept my attention ● It was a relaxing way of covering engineering topics 	
<p>Neutral or partially negative comments by Students (a selection)</p> <ul style="list-style-type: none"> ● Different ● It was good fun, though I don't feel that the topics and information was always conveyed. I got lost in several of them and found myself asking "what am I supposed to learn?" 	

Another question we asked the students was "What was the most boring presentation we had this quarter?". Not one student listed any of the student presentations as being the most boring one. They listed a variety of the professional speakers as being boring, but none of their own presentations were considered boring.

Conclusions and Recommendations

We believe we have created a mix of topics and presentation styles in our senior seminar course that engages the students in discussion about important issues they face as they are about to begin their professional careers. The important topics of *The Unwritten Laws of Engineering* were presented in ways that the students enjoyed and will remember.

Many universities have some sort of senior seminar where professionalism issues are dealt with. We encourage others to try creative ways to present this important content.

There were no major problems that would cause us to make significant changes in the presentation requirements. The next time the course is offered we will make more specific our requirements concerning language. A couple of the characters in two of the skits used profanity, which got a big reaction from the students. Some other students were concerned this might have helped improve the students' peer grade for those groups. We will be more explicit next time about the need to avoid such language.

Appendix—Presentation assignment described in paper

Students will make group presentations on selected topics from *The Unwritten Laws of Engineering*¹. Presentations must be more than just a summary of what is in the book. Students need to interpret the topic in some manner. How it is relevant (or not relevant) to their future careers is one aspect that should be considered. Use of other sources (like the library and WWW) should be used. Students must use some sort of audio/visual. In addition to the obvious PowerPoint type presentations, students should consider alternative forms such as drama/role play, and competitions. It is expected that these professional level presentations will be at least 30 minutes long.

Each group will report on two of the topics as shown in Table 1 of this paper. Groups are allowed to volunteer for which two topics they wish to present.

There are 62 students in the combined class, with 10 groups. Therefore each group should be about 6 students. On presentation days we will divide the class into two sections. During the presentations, each student in the group must participate.

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Biographical Information

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