

General Charge

The committee shall be responsible for reviewing and evaluating the Engineering Problem Solving I course, specifically the sustainability thereof. Are the current course objectives being met? If so, how best do we sustain the course long term with the increased enrollment? If not, provide recommendations for improvement.

Charge 1: Consider the logistical constraints (i.e., faculty and facility resources) and suggest improvements.

The enrollment in the EPS1 course has jumped in recent years. The first-day and final enrollments are shown in Table 1.

Table 1: EPS1 enrollment for the past five years. The number of lecture and project sections, along with the average number of students per section (based on first-day enrollment), are shown.

<table>
<thead>
<tr>
<th>Year</th>
<th>First-Day Enrollment</th>
<th>Final Enrollment</th>
<th>Lecture Sections</th>
<th>Project Sections</th>
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</table>

The increase is enrollment has been accommodated by adding additional sections. Prior to 2009, there were 12 project sections taught by six faculty instructors (2 sections per instructor). In 2010 and 2011, there were 16 sections taught by seven faculty instructors (2 section for six instructors, and 4 sections for one instructor). The lecture sections have been taught by two faculty instructors. With a significant future increase in student enrollment, the numbers of faculty involved teaching the course would need to increase if its format is unchanged.

The committee examined several options for coping with increased enrollment in the project sections. One option is to continue with the current course format; all the other options seek to reduce the faculty numbers for the project sections. Based on the current classroom limits (72 student maximum in 3505 SC), the maximum enrollment per section is currently 36 students. Each instructor meets with two sections together on Monday, and then meets in the same classroom with one section on Wednesday and the other on Friday. Therefore, the current student load per instructor is a maximum of 72. For the purpose of developing options, we examined increasing the maximum student numbers per instructor. For most
options, we considered a target of about 108 (a 50% increase). The selection of this level was based on our judgment that 54 students per section could occupy the current classroom with its 72-person capacity, yet still provide enough free space for students to work in a group setting. One other option involving a team-teaching approach considered a target of about 81 students per instructor (a 12.5% increase).

A detailed description of the project section options is provided in the section on *Logistical Options for EPS1 with Increasing Enrollment*. As a point of reference, the College of Engineering Strategic Plan envisions a 27% increase in undergraduate enrollment; this corresponds to an EPS1 enrollment of about 625 students by Fall 2015. Each describes the faculty involvement required for wide range of enrollments (include numbers much larger than current levels or even 625).

For each option, the committee also provided an assessment describing their advantages and drawbacks. Some observations from our assessment include:

- If the enrollment per project section were allowed to increase, a significant portion of the increase in enrollment in the near term could be managed with the current course format (Option 1) and the current course offerings (16 project sections). Recent averages of 27 to 32 students per project section are much below the 36 maximum capacities. Better managing enrollment in the project sections, and adding additional sections only when necessary, could be a strategy for handling increases in enrollment in the near term. However, once enrollment creep towards the 550 to 560 range, the current course format would begin to require additional faculty resources.

- The committee did not view options that significantly reduced in the number of project section class hours as favorably as those that maintained the current levels. In part, we found no evidence from students (see Charge 2) that the course load is excessive, so reducing the contact hours is not a priority. Students report that they value their experience in the project sections; reducing the meeting time significantly could have a significant impact on the quality of that experience.

- The committee did not view options with one project section meeting per week as favorably as those that meet twice per week. Project section instructors note that having frequent class meetings (at least twice per week), with time in class for students to work in teams, contributes to the success of the project section; a once-a-week class meeting would likely require that students arrange more time outside of class to meet and work.

- The committee believes the concept of dedicated project workspace area, in the spirit of a “project barn” or a “TILE classroom with tools”, is an attractive option. A current constraint with the project sections is that project activities must be limited to what can be done in a traditional classroom environment. However, the committee recognizes that this concept would require additional resources for startup and maintenance. Still, the concept is one that should be considered as a long-term strategy for the course in the future.
- A team-teaching option for the project section was considered. Team-teaching could increase the number of students per project instructor, but the option considered was not as efficient in this regard as other options.

The committee also reviewed options for handling larger enrollments in the lecture sections. Some observations include:

- Keeping the lecture sections in 1505 SC has the distinct advantage of getting first-year students into the engineering building and exposing them to the college’s culture. However, enrollments in excess of about 600 students would require increasing the number of lecture sections to five.

- There are few topics from the project sections that could be covered effectively in the lecture section. This is not a viable option for reducing the content of the project sections (facilitating a potential reduction in class hours in project sections).

Currently, all the EPS1 lecture and project sections are taught by tenure-track faculty. The committee discussed the implications of involving others in the EPS1 course. Our recommendations are:

- Non-tenure track instructors have made significant contributions in other engineering core courses. The committee believes that they could also make contributions in teaching EPS1. We feel that an element in the current success of the course is that instructors (by and large) enjoy being involved in the course, and have the right temperament for working with its unique student population. The same attributes should be sought with non-tenure track instructors.

- The committee does not recommend employing non-faculty practicing engineers as EPS1 instructors. The current course has instructors who are committed to the college, and take their role of welcoming new students to engineering and the college very seriously. Farming out this role those with loose commitments to the college and its goals could undermine the experience for first-year students (and potentially retention).

**Charge 2:** *Assess the consistency of the student workload across projects and compare to other 3 sh courses.*

The committee sought input from engineering students on their perceptions of EPS1. We wanted to learn from students who had progressed through the engineering curriculum, and could reflect on the role and contribution of the course to their education. It was our belief that first-year student’s perception change after they adapt to college-level requirement.

The committee and the Dean’s office arranged for group discussions on EPS1 with students serving as ambassadors, engineering tutors, and writing consultants. Their supervisors (Megan Allen, Scott Coffel, or Jane Dorman) led the student group discussions; committee member Maggie Lundstrom attended two of the discussions as an observer.
Prior to the discussions, the committee formulated questions to address issues related to this charge and Charge 3 (see below). An outline of the questions was given to the student participants before the discussions.

Some consensus findings from the three group discussion related to Charge 2 are:

- Students perceive differences in the nature of the work involved in different project sections. A few sections are seen as focused on “research and report writing”; these sections are perceived as requiring more work (and are less fun) than those sections seen as mostly “hands-on” design focused.

- Differences in the activities across the project sections are OK, but students strongly desire more consistency in the elements (e.g., hands-on work, report writing, etc).

- The amount of work the course requires was a surprise for nearly all the first-year students. However, with the perspective gained from experience in core engineering and upper level courses, the students feel the amount of work is appropriate for a 3 semester hour engineering course. The students characterized the workload as a “wake-up call” for what they will be doing for the next four years.

Recommendations:

- No major overhaul of EPS1 is needed to reduce the course workload. The current workload serves a necessary role in preparing first-year students for the workload expected in future engineering courses.

- Collaboration among course instructors to facilitate more consistency in the project section elements should be pursued. One activity should be the review and revision of the Project Section Guidelines established during the development of the course (see March 2002 report), to encourage more consistency and better reflect what is going on now (that works well). Enhanced sharing of course materials, using the newly established EPS1 shared drive, should also be encouraged. Finally, the emphasis on employing some “hands-on” elements to meet course goals should be continued.

**Charge 3**: Evaluate the effectiveness and findings of current student learning outcome assessments.

Based on the student group discussions of EPS1, most students view their experience in EPS1 favorably. The students strongly agreed that EPS1 helped them develop study habits needed for success in the engineering curriculum. When asked what the most valuable thing they got out of taking EPS1 was, the students replied:

- Teamwork
- Time management
- Communication
- Identity as an engineer
- Learned the design process
When asked what aspects of engineering they learned from the project section, the student’s answers included:

- Teamwork
- Communications skills
- Design
- Resume writing
- Project management
- How to write a formal report
- Organized thought process

They also reported that the project sections helped them see that there is much more to engineering than solving math and physics problems, and that the EPS1 course focuses on teaching them how to think like an engineer.

The committee’s conclusion is that the current EPS1 course is effective. In the original implementation plan for EPS1 (see March 2002 report), the course was described as an organized and planned “experiment”. Clearly, there has been some “tinkering” with the course over the years; but for the most part, it has been implemented as envisioned. The committee’s conclusion is that the “experiment” has been a success. The outcomes show that the students perceive the course to be meaningful, valuable and fun, and not overly burdensome.

Recommendations:

- No major overhaul of EPS1 is needed to make the course effective; students already perceive the course to be effective. The outcomes they cite from taking the course closely match those expressed in the original design and implementation plan, and those of the faculty on the committee with experience teaching the course.

- Logistical constraints from growing enrollment may result in changes in the way the course is delivered. The college should periodically survey how students (sophomore to seniors) perceive the course and its outcomes, to assure that the success of EPS1 continues after any changes.
College of Engineering
Engineering Problem Solving I Committee
Logistical Options for EPS1 with Increasing Enrollment

Project Section Options

1. Increase faculty instructors with increasing enrollment: Increase project section maximum enrollment to 36 students per section (72 seat maximum in 3505 SC). The format of the project section is unchanged. The total class time would remain the same [2450 min; 1000 min lecture; 1450 min project]. The number of sections and the maximum enrollment is shown below:

<table>
<thead>
<tr>
<th>Instructors</th>
<th>Project Sections</th>
<th>Students/Section</th>
<th>Maximum Enrollment</th>
<th>Students/Instructor</th>
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<tbody>
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Committee Assessment: If current faculty resources (8 faculty instructors) remain available for the near term, this option could be employed until enrollment significantly increases. In the past two years, there were 16 project sections offered for first-day enrollments of 435 students (Fall 2011) and 492 (Fall 2010). Current enrollments could be handled with 14 project sections (one instructor less) if the student numbers per section were increased closer to a 36 maximum. Furthermore, a significant portion of future increases in enrollment could be handled with the existing 16 project sections. One option to consider for the near term would be optimally manage scheduling of project sections (14 or 16), increasing the student numbers per section, with the minimal number of faculty instructors.

2. Large reduction in project section meeting time & increase the number of sections per faculty instructor: Change the format of the project sections to one meeting per week. This would result in about a 50% reduction in class meetings (from 29 to 15) [Labor day issue]. Maintain the maximum enrollment at 36 students per section. The total class time would be significantly reduced [1750 min; 1000 min lecture; 750 min project]. The number of sections and the maximum enrollment is shown below:

<table>
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<th>Project Sections</th>
<th>Students/Section</th>
<th>Maximum Enrollment</th>
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Committee Assessment: This option is not recommended. Current students value their experience in the project sections; reducing the meeting time in half would have a significant impact on the quality of that experience. Project section instructors note that having frequent class meetings (at least twice per week), with time in class for students to work in teams, contributes to the success of the project section; a once-a-week class meeting would likely require that students arrange more time outside of class to meet and work. This option would also require a radical redesign of the content of the project sections, something that would need time, planning, and faculty input, to accomplish.

3. Moderate reduction in project section meeting time & increase the number of students per section: Change the format of the project section to three meetings every two weeks. This would result in about a 25% reduction in class meetings (from 29 to 22) [No labor day issue]. Increase the enrollment to (say) 54 students per section. The total class time would be reduced [2100 min; 1000 min lecture; 1100 min project]. The number of sections and the maximum enrollment is shown below:

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Class Meeting Schedule -1-

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Class Meeting Schedule -2-

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Sign-up for a resume writing session (outside class time?)
Committee Assessment: A weakness of this option is the scheduling for students. The committee is concerned that first-year students would have difficulties with an irregular class schedule. The option would reduce the class meeting time by 25%; this reduction is more modest than option 3, but there is no evidence (from student evaluations) that reducing the course load for students should be a driving force. The classroom time per faculty instructor would not change with this option, but the number of students per section would increase by about 50%. This option would require a significant redesign of the content of the project sections, something that would need time, planning, and faculty input, to accomplish.

4. Once a week meetings times (75 min) & increase the number of students per section: Change the format of the project section to meet once per week for 75 min. This would result in about a 25% reduction in class meetings time. Increase the enrollment to (say) 54 students per section. The total class time would be reduced [2125 min; 1000 min lecture; 1125 min project]. The number of sections and the maximum enrollment is shown below (same as for option 3):

<table>
<thead>
<tr>
<th>Instructors</th>
<th>Project Sections</th>
<th>Students/Section</th>
<th>Maximum Enrollment</th>
<th>Students/Instructor</th>
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Committee Assessment: This option would reduce the class meeting time by 25%; this reduction is more modest than option 3, but there is no evidence (from student evaluations) that reducing the course load for students should be a driving force. This option utilizes one class meeting per week of a longer duration than the current course (one 75-min versus two 50-min). Project section instructors prefer having shorter, but more frequent, class meetings (at least twice per week), with time in class for students to work in teams; a once-a-week class meeting would likely require that students arrange more time outside of class to meet and work. The classroom time per faculty instructor would not change with this option, but the number of students per section would increase by about 50%. This option would require a significant redesign of the content of the project sections, something that would need time, planning, and faculty input, to accomplish.

5. A project workspace and classroom meetings: Change the format of the project section so that students meet once per week in the classroom, and once per week in a new project workspace area. Ideally, the project area would be a “project barn” or a “TILE classroom with tools”. Increase the enrollment to (say) 54 students per section. The total class time would remain the same [2450 min; 1000 min lecture; 1450 min project]. The number of sections and the maximum enrollment is shown below (same as for option 3 or 4):
Committee Assessment: This option would require a significant investment on the part of the college to develop appropriate project workspace classroom. Still, the committee found this to be an attractive option; the current use of classroom space only (3505 SC), and the lack of resources for project activities, are a severe constraint on the types of “hands-on” activities are utilized (and “hand-on” design activities are viewed by students as one of the most valuable aspects of the course). The option would not reduce the class meeting time for students. However, depending on the size of the workspace, faculty time per course would be impacted. If the project workspace can handle 54 students, then a faculty member would need to have two classroom and two project area meetings for two sections (4 meetings per week, rather than 3 per week). Such an increase in student contact time would make the course less attractive to faculty. If the project workspace can handle 108 students, then a faculty member could have two classroom and one project area meeting for two sections (3 meetings per week). This option would require some time, planning, and faculty input, to determine how design and best utilize the project workspace.

6. Team-teaching with project workspace and classroom meetings: Change the format of the project section so that students meet once per week in the classroom, and once per week in a new project workspace area. Ideally, the project area would be a “project barn” or a “TILE classroom with tools”. Use two faculty instructors to team-teach each section, with one teaching the classroom meeting and the other teaching the project workspace meetings. Each team handles three sections. Increase the enrollment to (say) 54 students per section (more if the project workspace capacity is larger). The total class time would remain the same [2450 min; 1000 min lecture; 1450 min project]. The number of sections and the maximum enrollment is shown below:

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<th>Sections</th>
<th>Students/Section</th>
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</table>

Committee Assessment: This option would require a significant investment on the part of the college to develop appropriate project workspace classroom. The option would not reduce the class meeting time for students. Team-teaching the sections has potential advantages and drawbacks. Students would interact with a third engineering faculty member (1 lecture and 2 projects). Faculty would have another person to share the load of three sections. But having to work together on a course is uncommon for faculty, and problems could arise. It will take a real faculty-team effort to have
seamless coordination from classroom and project workspace meetings for students. The classroom
time per faculty instructor would not change with this option (3 times per week for 3 sections).
However, the number of faculty instructors required would be higher with this option than with
others (options 2 through 5). Still, it is more efficient with faculty resources than the existing course
(see option 1).

**Lecture Section Options**

The lecture can accommodate up to about 600 students with four sections in 1505 SC. The lecture would
need to increase to five sections to remain in 1505 SC. Moving the lecture sections to another location (with
larger capacity) was not preferred by the committee; maintaining the classes presence in the engineering
building is considered important for integrating first-year students into the College of Engineering culture.

The lecture could be changed to reduce the course workload. The main workload is associated with
submitted HW problems, which take considerable time for first-year students to prepare. The number of
submitted HW problems for grading could be reduced, and replaced with other less time-consuming
assignments:

- ICON quizzes on material
- Submit answers to “scratch paper” solutions for grading (online or other means).
- Use weekly in-class assignments (clickers?)

The lecture could also be changed to cover some material that is now covered in the project sections:

- Resume writing (with a classroom lecture by Phil Jordan) [info shared with projects]
- Story-writing [info shared with projects].

A survey of current project instructors did not indicate that there were many topics from the project sections
that could be transferred to the lecture sections. In general, the project instructors prefer to cover resume
writing and story-writing within the project sections.
The committee has the following charges:

**Charge 1:** Consider the logistical constraints (i.e., faculty and facility resources) and suggest improvements.

**Charge 2:** Assess the consistency of the student workload across projects and compare to other 3 sh courses.

**Charge 3:** Evaluate the effectiveness and findings of current student learning outcome assessments.

Student group discussions will be a way the committee gets the students’ perspectives on Engineering Problem Solving I (EPS1). The outcomes from your discussions will help the committee gauge the effectiveness of the course, its required workload, and its role in the engineering curriculum.

The following are some questions to help get the discussion going:

1. Looking back on when you took EPS1, did you feel (at the time) that the course work load was appropriate for a 3 sh course?

   If you felt it was a large amount of work:

   - Is it that you were not used to the amount of work required of engineering courses yet?
   - Is it that the work load in EPS1 is higher than other first-year courses (e.g., chemistry)?
   - Is it that the combined work of the lecture and project sections was equivalent to two courses?

2. How does the course work load for EPS1 compare with that in other core engineering courses you have taken (e.g., EPS2, statics, thermodynamics)?

   In terms of the course workload:

   - Was the class a shock to your system?
   - How long did it take to learn how to handle it?
   - Did you see other students struggling?

   - How do you rate the level of difficulty of the material covered in lecture and project sections?
   - Did you have to work harder in your project section than students in others? Was it the other way around?
   - Is there a consensus among students that the workload (though different) is about the same in all the project sections?

3. What aspects of engineering did you learn from the project section?
• Did you see that there is much more to “engineering” than just solving math, physics, and chemistry problems?
• What did you learn about the concept of “engineering” in the process?
• Did the class help you form a philosophical foundation for you approach to becoming a good engineer?
• Did it allow you to explain the basics and value of “engineering” to friends, classmates and family?
• Were you surprised by the variety of problem-solving challenges, from the macro to the micro scale?

4. In what ways does the project section engage students that are different from other first-year courses?

• Was the class fun?
• Did you enjoy the outlet for you creativity in a hands-on fashion?
• What was your reaction to working on open-ended problems? Did the experience surprise or inspire you in some way? Did the open-ended nature encourage you to work harder than you might otherwise?

5. Were you undecided about whether you really wanted to be in engineering when you arrived? Did you ever consider leaving engineering?

• How did your experience in EPS1 affect your perception of engineering?
• How did your experience in EPS1 affect your decision to stay in engineering?

6. Do you feel that EPS1 helped you?

• Did it help you maintain your interest in engineering?
• Did it fuel your interest in a particular area of engineering?
• Did it develop study habits needed for success in the engineering curriculum?
• Did it help you understand what engineering is about?
• Did it help you in other ways?

7. Does EPS1 help students become acclimated with engineering at Iowa?

• Did you make friends and colleagues that you still work and/or socialize now?
• Did working in the engineering building on EPS1 make you feel part of the college?

8. What is the most valuable thing you got out of taking EPS1?
Our committee is seeking to evaluate the effectiveness of the Engineering Problem Solving I (EPS1) course, and find ways to adapt as enrollment grows in the College of Engineering. At your current stage within the engineering curriculum, you are in a position to look back on your experiences in the EPS1 and their impact on your engineering education. We are very interested in learning about your perspective.

The following are some questions to get you thinking about the course and its role in the engineering curriculum.

1. Looking back on when you took EPS1, did you feel (at the time) that the course work load was appropriate for a 3 sh course?

2. How does the course work load for EPS1 compare with that in other core engineering courses you have taken (e.g., EPS2, statics, thermodynamics)?

3. What aspects of engineering did you learn from the project section?

4. In what ways does the project section engage students that are different from other first-year courses?

5. Were you undecided about whether you really wanted to be in engineering when you arrived? Did you ever consider leaving engineering?

6. Do you feel that EPS1 helped you?

7. Does EPS1 help students become acclimated with engineering at Iowa?

8. What is the most valuable thing you got out of taking EPS1?
Summary
Student Group Discussion about Engineering Problem Solving I
Hansen CTC Student Writing Tutors
4 November 2011

Discussion Leader: Scott Coffel

1. Looking back on when you took EPS1, did you feel (at the time) that the course work load was appropriate for a 3 sh course?

   • In retrospect, a third-year student said that the EPS-I work load, which seemed “like a ton of work,” was in reality quite reasonable.

   • Another third-year student found the course comparable or easier than EPS-II.

2. How does the course work load for EPS1 compare with that in other core engineering courses you have taken (e.g., EPS2, statics, thermodynamics)?

   • EPS-I acclimated students to extensive homework.

   • Students noticed disparities between project sections, particularly in emphasis on documenting their work.

   • Students noticed many of their peers struggling to grasp and/or keep up with the assignments.

3. What aspects of engineering did you learn from the project section?

   • Great difference in rigor/formality between project sections.

   • In some sections, students learned how to make good estimations and assumptions “out of nothing.”

   • In other sections, an emphasis on writing detailed reports and making professional presentations prepared students for work in industry.

   • Some felt their projects were immature, while other viewed the same projects as attempts to “push us out of our comfort zone.”

   • All students desired a more balanced distribution of assignments.

4. In what ways does the project section engage students that are different from other first-year courses?
• Students appreciated the group-oriented dynamic of EPS-I.

5. Were you undecided about whether you really wanted to be in engineering when you arrived? Did you ever consider leaving engineering?

• Many students were undecided about engineering before and after they enrolled.

• One student, possessed of a strong determination to become an engineer, came from a small high school where low exceptions were the norm.

• Several students did consider leaving engineering at the beginning of their first semester; for one student, taking EPS-I made the transition to engineering easier, as it resembled in structure a great course taken in high school.

6. Do you feel that EPS1 helped you?

• EPS-I helped to familiarize students with the Seamans Center.

• For one student, the mass balance problem led them to Chemical Engineering.

• It helped students to learn how to work with others.

• It helped students develop effective study habits.

7. Does EPS1 help students become acclimated with engineering at Iowa?

• EPS-I was crucial to the socialization process; multiple friendships were developed and sustained.

8. What is the most valuable thing you got out of taking EPS1?

• EPS-I helped many students develop “an optimistic approach” to engineering.
Summary
Student Group Discussion about Engineering Problem Solving I
Engineering Student Ambassadors
9 November 2011

Discussion Leader: Jane Dorman
Student Ambassadors: 6 seniors, 9 juniors, 2 sophomores
All engineering majors represented

1. Looking back on when you took EPS1, did you feel (at the time) that the course work load was appropriate for a 3 sh course?
   • Yes, especially since the lecture section ends after 12 weeks.

   If you felt it was a large amount of work:

   • Unanimous agreement that (at the time) it felt like a lot of work.
   • HW 1 was too long, people didn’t know what they were doing, was too exact with calculations; mass balance problems seemed like busy work
   • It was smart to do it this way ... once you get into the 3rd semester and beyond, looking back it feels like nothing
   • Person taking EPS I + Thermo together, EPS I a lot more work

   Is it that you were not used to the amount of work required of engineering courses yet?

   • Yes, that was a big part of it; was like a wake-up call for what you’ll be doing for the next four years

   Is it that the work load in EPS1 is higher than other first-year courses (e.g., chemistry)?

   • Not necessarily, depends on your areas of strength

   Is it that the combined work of the lecture and project sections was equivalent to two courses?

   • No, not quite.
   • EPS I lecture jumped all around with topics.

2. How does the course work load for EPS1 compare with that in other core engineering courses you have taken (e.g., EPS2, statics, thermodynamics)?

   • About the same; depends on individual strengths

   In terms of the course workload, was the class a shock to your system?
Words “to your system” was not how they’d describe it
Definitely surprising; supposed to be culture shock
Stated multiple times: don’t wait till the last minute
Didn’t believe the first HW would take 10-12 hours but it did
One lecture teacher said the equivalent of “look to your left, look to your right ...
How long did it take to learn how to handle it?

One HW

Did you see other students struggling?

Oh, yes.
Mostly procrastination; needing to ask questions but can’t do that at last minute

How do you rate the level of difficulty of the material covered in lecture and project sections?

Project section can be really easy, but it depends on who you have

Did you have to work harder in your project section than students in others? Was it the other way around?

Some of the people interviewed felt they had to work MUCH harder than other students did in the project section; these students also felt they had a lot less fun

Is there a consensus among students that the workload (though different) is about the same in all the project sections?

NO.
Some have more fun projects; some work a lot harder; some have a lot more outside work; some have more paperwork (report writing, etc.); some have more building

3. What aspects of engineering did you learn from the project section?

Building stuff gave purpose, made learning much more interesting
Teamwork
Communication skills
Design
Resume
Test to failure
Project management
How to write formal report
• Learning about proposals, how to get funding, etc.
• Organized thought process

Did you see that there is much more to “engineering” than just solving math, physics, and chemistry problems?

• Yes
• Focus on: this is teaching you how to think like an engineer. It won’t always be necessary for you to write down every step in the process, although it’s important now.

What did you learn about the concept of “engineering” in the process?

• See previous list

Did the class help you form a philosophical foundation for your approach to becoming a good engineer?

• Didn’t understand the question

Did it allow you to explain the basics and value of “engineering” to friends, classmates and family?

• Yes, and gave you something to talk about

Were you surprised by the variety of problem-solving challenges, from the macro to the micro scale?

• Didn’t understand the question

4. In what ways does the project section engage students that are different from other first-year courses?

• Forced teamwork; lot of creativity

Was the class fun?

• Yes for all except the students in the report-writing section

Did you enjoy the outlet for your creativity in a hands-on fashion?

• Big yes.
What was your reaction to working on open-ended problems? Did the experience surprise or inspire you in some way? Did the open-ended nature encourage you to work harder than you might otherwise?

- Learned to think outside the box
- Yes to the inspiration question
- Not sure about working harder

5. Were you undecided about whether you really wanted to be in engineering when you arrived?

- Yes and no

Did you ever consider leaving engineering?

- Most said no
- Not from this class (3rd semester was terrible)

How did your experience in EPS1 affect your perception of engineering?

- Positively or neutral

How did your experience in EPS1 affect your decision to stay in engineering?

- One person had two project group members drop out

6. Do you feel that EPS1 helped you?

- Yes
- For ChemE, Civil, ECE, IE, the focus on the formatting was only seen again in Thermo

Did it help you maintain your interest in engineering?

- Yes or neutral; still better than alternative majors

Did it fuel your interest in a particular area of engineering?

- Yes, based on project
- One person said the experience pushed them away from the major they were considering (civil)

Did it develop study habits needed for success in the engineering curriculum?

- YES!
• Value of working in teams (and how to)

Did it help you understand what engineering is about?
• Yes

Did it help you in other ways?
• Made friends
• Learning time management

7. Does EPS1 help students become acclimated with engineering at Iowa?
• Yes

Did you make friends and colleagues that you still work and/or socialize now?
• Yes, definitely

Did working in the engineering building on EPS1 make you feel part of the college?
• Yes or probably yes
• No other classes in SC

8. What is the most valuable thing you got out of taking EPS1?
• Teamwork
• Time mgmt.
• Process
• Communication
• Identity as an engineer
• A professor knows your name
• Learned the design process