

## First-Year Engineering Curriculum Committee Minutes

February 25, 2014, 3:30pm-4:30pm

### Attending:

Representing the Schools: Bill Anderson (AAE), Kendra Erk (MSE), Eric Ferguson (ECE), Garrett Jeong (CE), Jim Jones (ME), John Lumkes (ABE)  
Representing FYE: David Radcliffe (Chair), Billi Jennings, Stephen Hoffmann

Notes submitted by Stephen Hoffmann.

### Discussion items and committee actions:

1. The Committee discussed the proposed changes to the FYE Requirements. The Committee agreed to keep the C- requirement in order to be consistent with the College of Engineering General Education requirement (even though the University Core Curriculum does not require a C- grade in courses). The Committee also discussed and agreed to the addition of the 30-credit rule for completion of FYE.

The Committee then welcomed a formal motion from Jim Jones to approve the EFD, seconded by Garrett Jeong. **The motion was approved unanimously**; the new requirements will go forward to the ECC as EFD #35-14.

2. The Committee reviewed and discussed the EFD for the creation of ENGR 13300 that had previously been approved by the faculty of Engineering Education. A few small issues and clarifications were discussed. Then, Garrett Jeong moved for a vote of support for the EFD from the Committee. John Lumkes seconded. **The motion was approved unanimously**. The course will go forward to the ECC as EFD #36-14.
3. The Committee discussed some draft language for revision of the course descriptions and learning objectives for ENGR 13100 and ENGR 13200. This has been a topic of conversation among ENE faculty who teach the courses, and they have reached out to the FYECC for comment and concerns. In addition to a few typographical errors, the Committee recommended a further explanation of the role of diversity in ENGR 13100, perhaps through the addition of a learning objective. There was no formal motion, but in general, the Committee was comfortable with the proposed changes and appreciated that they represent a simplification.
4. The Committee discussed a proposal to review, and potentially revise, the course description and course structure of ENGR 10300. There was general agreement that it would be good to have the descriptions match practice, to have the description written to be general and flexible, and to introduce the "variable title" attribute to the course. David Radcliffe asked Stephen Hoffmann to draft an EFD with potential changes for review and discussion at a future meeting, and asked the committee to discuss with their colleagues who teach ENGR 10300 what they would like to see changed and what they would like to see retained. This item will be revisited soon.

5. Informational item: the Committee reviewed the draft Degree Maps that FYE has prepared. The Committee was supportive of the maps, and suggested the inclusion of CGT 163 as a potential next-step course.
6. Other business: Jim Jones mentioned that ME is working with universities around the state on development of a Single Articulation Pathway for Mechanical Engineering. When the initial draft is fully developed, he will share with FYE and the FYECC for comment.

## First-Year Engineering Curriculum Committee Minutes

April 22, 2014, 1:00pm-2:00pm

### Attending:

Representing the Schools: Bill Anderson (AAE), Pat Brunese (IE), Eric Ferguson (ECE), Garrett Jeong (CE), Jim Jones (ME), John Lumkes (ABE)  
Representing FYE: David Radcliffe (Chair), Billi Jennings, Stephen Hoffmann

Notes submitted by Stephen Hoffmann.

### Discussion items and committee actions:

1. EAI Calculation Policy: The committee had a brief discussion about how to calculate the EAI for students who have credit for ENGR 141/142, and may be able to use that credit to meet the Science Selective requirement. (Note that this option does not apply for students entering in Fall 2015 or later). The committee has discussed this previously. Two options were presented. In discussions, option B (where the non-ENGR 141/142 science selective will count in EAI if it is present) emerged with support. Jim Jones moved to accept this option, Pat Brunese seconded. Vote six in favor, zero opposed, one abstention. Vote passed. Exact language passed: **“For the Science Selective requirement: The grade used in calculating the EAI is the highest grade of all Science Selective courses other than ENGR 14100 or ENGR 14200 (if same grade, use course with most credits; if same grade and credits, use most recent course). It is possible that some students with credit in ENGR 14100 and 14200 will have no other Science Selective course to be included in EAI.”**
2. CODO Requirement Change: The committee discussed adding the newly approved courses ENGR 13300, EPCS 11100, and EPCS 12100 to the list of courses that will be considered in the CODO application GPA calculation. Motion by Jim Jones to approve; Garrett Jeong seconded. Vote unanimous in favor. Vote passed. Exact language passed: Item 4 of CODO course requirements will read (new text in italics): **“Introductory Engineering courses (ENGR 12600, 13100, 13200, *13300*, 14100, 14200, select offerings of 19500, or equivalents, and *EPCS 11100 and 12100*). Note that courses from this category are not required for CODO, but will be considered in the CODO application if they have been taken.”**
3. Discussion about ENGR 141/142 Science Selective Issue. The modifications to the FYE Curriculum EFD (#35-14) require all parties to come to a mutually agreeable solution to the concern that the bundling of Engineering and Science Selective requirements in ENGR 141/142 unfairly disadvantages some schools. David Radcliffe presented five options that FYE has identified for addressing this issue. The conversation at this point centered around a full explanation of options and an identification of pros and cons. The committee explicitly remained neutral and avoided making any decisions about favored options. After the meeting, the pro-con list will be further developed and shared with stakeholders, and FYECC may meet again before the end of the year to begin to deliberate the options.

4. Draft EFD for acceptable substitutions to FYE requirements: In response to the recent directive from ECC that ENGR 141/142 have not been accepted substitutions for the EFD-approved Science Selective list, FYE has developed a complete list of currently accepted substitutions. The committee discussed if this list should be submitted to ECC through the EFD process. There was considerable concern that continual updating of this list through the EFD process would be overly time-consuming. Instead, members of the committee encouraged seeking authority of FYECC to approve, maintain, and circulate the list of acceptable substitution courses for FYE requirements. Stephen Hoffmann will take this recommendation and draft an EFD for the consideration of the committee at a later meeting.
  
  5. The newly-created FYECC Intranet site:  
(<https://engineering.purdue.edu/Intranet/Groups/Committees/FECC>)  
was unveiled to the committee. The site was built using a likely incomplete archive of committee documents (including agendas and minutes), so all members were encouraged to send any further documentation they may have to Stephen Hoffmann. For now, the site is restricted to members of the committee, but the committee may decide at a later date to open portions or all of the site to a larger community, or even to unrestricted public access.
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Additional notes — NOT mentioned at the meeting.

There was no time for discussion of future issues for the committee to address in Fall 2014. For the record, these are some of the issues that FYE has identified that the committee may choose to address:

1. Continued discussion and action on the ENGR 141/142 Science Selective issue
2. Clarification of substitute courses allowed for FYE requirements, and rules/authorizations to edit the substitute course list
3. Potential revisions to the “four-semester” rule
4. Potential revisions to the EFD/course documentation for ENGR 10300 and 10400
5. Potential revisions to course descriptions for ENGR 13100 and ENGR 13200
6. Potential formal submission to ECC about EAI calculation method, and procedures for editing the EAI calculation method.
7. Program assessment goals

**Option A: Status quo:** Retain ENGR 141/142 as seven credits total, retain programming component to the courses, submit EFD to seek full faculty approval to extend use of 141/142 as a science selective indefinitely

### **Pros**

- provides consistency with previous years from student perspective
- retains benefits of 'in context' teaching of programming in ENGR 141/142; no need to adjust course documents for ENGR 141/142

### **Cons**

- does not address concerns of some schools
- would likely require a full faculty vote where interests of schools are pitted against each other

**Option B: Programming plus:** Retain ENGR 141/142 as seven credits total, retain programming component in courses, require students to take a separate Science Selective to complete FYE requirements.

### **Pros**

- simplest solution to implement (requires no further EFD)
- retains benefits of 'in context' teaching of programming in ENGR 141/142

### **Cons**

- increases total number of credits to complete FYE for Honors students (unknown if students will continue to have room with increase in International students in Honors)
- repeats material for students who take CS159 to meet Science Selective

**Option C: Chemistry option:** Revise ENGR 141/142 (or create new course numbers) to create a “chemistry” versions, which would combine Engineering topics with Chemistry topics. Retain ENGR 141/142 as seven credits. Retain ability of either version ENGR 141/142 to count for Science Selective and FYE completion. Schools would be allowed to require a specific version (or the other version + additional Science Selective) for admission.

### Pros

- would provide students with opportunity to specialize
- would address concerns of some schools and make 141/142 more “discipline neutral”
- would continue benefits of ‘in context’ teaching of related material with engineering content

### Cons

- would require significant additional resources
- it is doubtful that engineering material and chemistry material can be integrated as effectively as programming and engineering
- would likely require FYE to develop chemistry laboratories, or to develop a partnership with Chemistry (who may not be willing)
- would require students to choose their area of study before the start of the fall semester, which works against philosophy of common first year

**Option D: 141/142 Revision:** Revise ENGR 141/142 to include only Engineering content. Reduce course credits to four total. Disallow ENGR 141/142 from counting as Science Selective. Allow students to take Science Selective of choice for FYE completion. Schools reserve current right to require a specific Science Selective for admission to school.

### **Pros**

- straightforward and easy to explain solution
- would help align 141/142 with 131/132, potentially allowing easier cross-fertilization of successful ideas between the two tracks
- would provide students with opportunity to specialize in second semester
- would make 141/142 more discipline neutral
- would allow FYE Honors students to seek Honors credit in fields other than Engineering (and to take ENGR 131/132 if student desires or if space is limited)
- would ease room scheduling pressure for FYE

### **Cons**

- loses benefits of 'in context' teaching of related material in FYE
- may result in the loss of some of the sense of the Honors cohort



**Option E: Removal of Science Selective:** Remove Science Selective requirement for FYE completion. Replace with specified course or courses for admission to particular school that students are advised to take in the first year, but that are not officially part of the FYE curriculum.

### **Pros**

- would return FYE to a truly common curriculum
- would return control of science requirements to schools (which may help with ABET concern regarding programming)
- individual schools could decide if extra credits of ENGR 141/142 meet graduation reqs.

### **Cons**

- removes some flexibility of students in the first year.
- sets up need for more careful advising (and a more difficult audit) if FYE completion requirements to not match school entrance requirements.

**Option F: Other:**

**Pros**

**Cons**

## First-Year Engineering Curriculum Committee Minutes

May 6, 2014; 9:30am-10:30am

### Attending:

Representing the Schools: Sean Brophy (ENE), Pat Brunese (IE), Kendra Erk (MSE),  
Garrett Jeong (CE), Jim Jones (ME), Matt Ohland (ENE),  
Representing FYE: David Radcliffe, Billi Jennings, Stephen Hoffmann  
Guests: Eric Nauman (Honors)

Notes submitted by Stephen Hoffmann

### Discussion items and committee actions:

#### 1. Science selective and ENGR 141/142

The committee continued the long discussion of how to approach the issue of ENGR 141/142 and the Science Selective (the recently passed EFD allows the courses to be used as a Science Selective for only one more year; a permanent solution will need to be proposed and passed through the EFD process in 2014-15). Eric Nauman, Director of the Engineering Honors Program (CoEHP), was present to provide the perspective of CoEHP and to answer questions.

The conversation centered around the six options that were presented and adjusted at the April meeting.

Eric Nauman said that from CoEHP perspective, the combination of design and programming is really effective, and worth more than the sum of its parts. They would strongly support keeping the two together (either option (b) or (e) would be his preference). He also said that option (c), the creation of a "chemistry focus" version of ENGR 141/142 was removed from consideration by Dean Jamieson.

Others noted that with option (b), students still need to take a science selective to leave FYE, and if they choose CS 15900, there will be repetitive content. In a credit-limited environment, it is problematic to have any structure that requires students to take more credits than the minimum, or to take repetitive credit or content.

There was some conversation about what data could be gathered to show if the disadvantage to the programs that require CHM 116 is actually manifested in the enrollment patterns of students. We can check data from the last several years comparing 131 to 141 students; and Matt Ohland has data from his research that may show the disciplinary patterns of high-achieving students (top 5%), so we can see if our structural issue affects students who otherwise might have gone to a CHM 116-requiring school.

After the meeting, Stephen Hoffmann and David Radcliffe created the attached document that attempts to describe and categorize the current state of thinking about the options. This document will be shared widely through the summer, and the committee will gather input and data and take up the issue again the first thing in the fall.

2. Substitute courses

Stephen Hoffmann distributed a draft EFD with criteria for deciding which courses may substitute for FYE requirements (see attached document). In general, there was complete support for the document and its approach, but by the time this came up for discussion, several members had left, so a vote was tabled. The committee will vote on this first thing in the fall, perhaps via email if it is difficult to arrange an early meeting.

3. Panama opportunity

David Radcliffe quickly presented an opportunity that has arisen through the Global Engagement Office in Hovde. The government of Panama would like to set up an institution in Panama that has courses that have been designed to be equivalent to our first year (or first two years) of coursework, so as to create a smooth transfer pathway for Panamanian students to a Purdue Engineering degree. Members of the committee expressed support of this idea in principle, but expressed skepticism about the timetable and a desire to learn more.

## ENGR 141/142 Science Selective Issue

### Background

The modified version of EFD 35-14, approved on April 22, 2014, requires that First-Year Engineering students enrolling in or after Fall 2015 may not use ENGR 141/142 as a science selective. In response, the First-Year Engineering Curriculum Committee (FYECC) has discussed several options for addressing this issue. FYECC has targeted submission of any necessary Engineering Faculty Documents to the ECC by October 1, in order to allow for full input and consideration of any proposal, and to allow for approval of the final plan in time to make arrangements for Fall 2015 courses. The pros and cons of various options were reviewed and discussed at two FYECC meetings (April 22 and May 6), and a document was created that lists the options and their relative merits. The CoE Honors Program has reviewed and had input to the document, including attendance and participation in the May 6 FYECC meeting.

### Possible Options

After the FYECC meeting on May 6, five options remained as listed below. ("Option C," which would have created a Chemistry version of ENGR 141/142 has been removed due to objections from Dean Jamieson). It should be noted that FYECC has **not** made any determinations about which of the following options is preferred. The remaining options, and a brief description of pros and cons, are:

**Option A: "Status quo."** Retain the historical and current situation: ENGR 141/142 is seven credits total, includes programming content, and counts for a science selective for FYE.

- This option does not address the concerns or disadvantages for students entering the programs that require CHM 116 but not CS 159 (MSE, CHE, most of ABE, EEE), but it maintains the pedagogical advantages of teaching programming in the context of engineering. FYECC recognizes that ECC instructed FYE to stop the status quo practice, but that does preclude FYECC from bringing forward an EFD to reinstate, if the faculty decide that this is the most appropriate option.

**Option B: "Current 141 + Science Selective."** ENGR 141/142 is seven credits total, and includes programming content, but does not count for a science selective for FYE.

- This option removes the *relative* disadvantage of the number of credits required for students entering programs that require CHM 116 but not CS 159, and maintains the pedagogical advantages of teaching programming in the context of engineering. However, if students are still required to take a Science Selective course to leave FYE, the option adds credits for all programs that do not specifically require CHM 116 — AAE, CE, CEM, IE, ME, MDE — even if the school recognizes 141/142 as meeting degree needs for programming, the student still needs to take CHM 116 or CS 159 to leave FYE. The option does not reduce credits needed for ABE, CHE, EEE, MSE students.

**Option D: "141/142 to Engineering only."** Revise ENGR 141/142 to four credits total, remove programming content, include fundamental engineering content only (analogous to ENGR 131/132), do not count for a science selective for FYE.

- This option removes the additional credits required for MSE, CHE, ABE, and EEE students, and does not add any additional credits to other programs. It is the option with the minimum required credits for all students, and it brings 141/142 into a more

parallel structure with 131/132. However, the option would cause the loss of current advantages of teaching programming in engineering context.

**Option E: "Removal of Science Selective from FYE."** Retain current ENGR 141/142, remove the Science Selective requirement to re-establish a truly common first-year, allow schools to decide individually if 141/142 meets programming needs for degree.

- This option would allow individual schools to determine if ENGR 141/142, as it currently stands, meets the degree needs for the additional science (or programming) course. It would help make FYE a more common experience by removing FYE from any decisions around the Science Selective (leaving eight truly common course requirements). It would retain the advantages of teaching programming in context, but it would not change the total number of credits needed for students entering any program that requires CHM 116 but not CS 159.

**Option F: "141/142 new material."** Retain ENGR 141/142 at seven credits, but replace programming material with other material that allows students to challenge themselves and put engineering skills into practice, do not count for a science selective for FYE.

- This option removes the relative disadvantage to chemistry-requiring programs by choosing material for 141/142 that is truly common to all programs. It would require students headed to programs other than MSE, CHE, EEE, and ABE to take more credits than they currently do. The option supports the ideals of a common first year. It will lose the advantages of teaching programming in context, but allows for the possibility of replacing with other ways of learning in context.

As a side note, the FYECC also discussed changing the rules around whether ENGR 141/142 is *required* for all Honors FYE students, and whether ENGR 141/142 is open to FYE students who are not in the CoE Honors program. These questions are set aside for now, because they are not directly related to the Science Selective issue, and future plans could work with any of the five options listed above.

In considering these five remaining options, it is useful to revisit the initial objection from the flagger to EFD 35-14. Others may have other objections, but this is a useful starting point. The text of the flag was:

The honors program, by tailoring ENGR 14100/14200 to incorporate content tied to a computer science course that counts as a science selective has apparently chosen to create a higher activation barrier to honors students going into majors that do not require the computer science course (for instance, MSE requires CHM 11600 and not CS 15900). I object to a program making decisions that ease the path to some professional schools and put others at a disadvantage. I would want to see all first year programming be engineering degree agnostic, and not put in place an unintended barrier or additional requirement to students interested in any of the schools in the college.

I do not care if the problem is solved by removing the "easing" into some schools, or "easing" paths are created into all schools. I object to it not being a level playing field for the first year students choosing MSE, and I further find it inconsiderate that programs within the first year (in this case honors) appear to be biased towards some of the professional schools at the expense of others.

From this text and from other discussions, we are able to define four fundamental sources of concern (which may overlap):

1. "Credit disadvantage": Additional credits are needed by ENGR 141/142 students to be able to meet the requirements of some programs. These additional credits may place those programs at a disadvantage, and may discourage students from entering those programs.
2. "Implication disadvantage": The inclusion of programming material in ENGR 141/142 implies that programming is central to all of engineering, and disciplines which do not regularly use programming may be less rigorous, or less appropriate for high-achieving students.
3. "Philosophy of commonality": First-year engineering should be a common curriculum, and everything in first-year engineering should be applicable to all forms of engineering.
4. "Programming synergy": The integration of programming and engineering content in ENGR 141/142 allows students to learn in context and to accomplish richer, more meaningful projects and design activities.

Which of these four is the fundamental concern for the flagger (and which of these four is most important to the Faculty of Engineering generally) may determine which option is best.

The table below summarizes how the options address each concern on a simple (perhaps overly simple) "good-bad" scale.

| Option | Credit disadvantage  | Implication disadvantage       | Philosophy of Commonality | Programming Synergy |
|--------|--|--------------------------------|---------------------------|---------------------|
| A      | bad for ABE, CHE, EEE, and MSE   | bad for ABE, CHE, EEE, and MSE | bad                       | good                |
| B      | bad for AAE, ABE, CE, CEM, CHE, EEE, IE, ME, MDE, and MSE                  | bad for ABE, CHE, EEE, and MSE | bad                       | good                |
| D      | good   | good                           | good                      | bad                 |
| E      | bad for ABE, CHE, EEE, and MSE   | bad for ABE, CHE, EEE, and MSE | good                      | good                |
| F      | bad for everyone (or, good if the goal is to avoid relative disadvantages) | good                           | good                      | uncertain           |

### Next Steps

In preparation for further discussions early in fall, FYE will continue to gather data and input on the issue over the summer, particularly in three areas:

- 1) conversations with stakeholders in ABE, CHE, EEE, and MSE, to understand more completely which of the three disadvantages are most important.
- 2) collection of data from Purdue and peer institutions to see if we can determine if data support that the credit and implication disadvantages translate into student choice behavior and lower enrollment for any of the four currently disadvantaged schools.
- 3) collection and analysis of data for 141/142 specifically, or review of available literature more generally, to show the extent of advantages of teaching programming in context.

**To:** The Faculty of the College of Engineering

**From:** The First-Year Engineering Curriculum Committee

**Re:** Accepted substitutions for FYE curricular requirements

The First Year Engineering Curriculum Committee (FYECC) has established the following set of limited criteria for determining courses that are acceptable substitutions for First Year Engineering (FYE) curricular requirements. The FYECC now forwards this document to the Engineering Curriculum Committee with a recommendation for approval.

The following table lists the six criteria and an *example* of the courses that would qualify as an acceptable substitution based on each criterion (the example list is not exhaustive).

A course (or set of courses) may approved by FYECC as an acceptable substitution for an FYE curricular requirement if it meets at least one of the following criteria:

| <b>Criteria for acceptable substitutions</b>  | <b>Examples</b>  |
|---|--|
| 1. the course(s) are substantially equivalent in course material to a Purdue West-Lafayette course, but are only offered at other Purdue University campuses.   | ENGR 12100 at IPFW may substitute for ENGR 13200.                                    |
| 2. the course(s) are substantially equivalent in course material to a course in the FYE curriculum, but are intended for students in a different College or different major (this typically applies only for students who earn the course credit prior to entering the College of Engineering). | CS 15800 may substitute for CS 15900.<br><br>CHM 12901 may substitute for CHM 11600. |
| 3. the course(s) are a direct honors version or accelerated version of a course in the FYE curriculum   | MA 18100 may substitute for MA 16200   |
| 4. the offering department of the course(s) does not allow credit for both the course in the FYE curriculum and the substitute course (or courses).   | CS 18000 may substitute for CS 15900   |
| 5. the course(s) are a variable title experimental course designed to substitute for a course in the FYE curriculum, before the new course has been granted a permanent course number.  | ENGR 19500 (EPICS LC, taken in Fall 2012 or Fall 2013) may substitute for ENGR 13300 |



|   |  |
|---|--|
| 6. the course(s) are an earlier version of the current courses that have been phased out on the Purdue-West Lafayette campus (this will likely only be important for re-entry or re-admission students who have been away for several years). | [ENGR 10000 and ENGR 12600], as a group, may substitute for [ENGR 13100 and ENGR 13200]. |
|---|--|

Following these criteria, the FYECC will have the authority to determine substitutions that can be generally applied to all FYE students (and which will, if appropriate, be included in the EAI calculation). FYECC will maintain and publicize the list of acceptable substitutions.

Because FYE students are not officially associated with any degree program, the list of acceptable substitutions will apply to all FYE students for the purposes of finishing FYE requirements and meeting entrance requirements, if any, into all Engineering degree programs. For the purposes of degree completion, degree programs are strongly encouraged to recognize the same list of acceptable substitutions.

For Purdue courses, FYECC will **not** establish course equivalency. It will merely establish which Purdue courses may substitute for listed course in the FYE curriculum.

This document does not affect equivalency determination of transfer courses, which is done administratively by FYE and the Credit Evaluation Office in the Office of Admissions. Transfer courses that are determined as equivalent will post to a student's transcript as the appropriate Purdue course.

The set of criteria listed above is restrictive. Any course that does not meet at least one of these criteria will not be approved as an accepted substitution by FYECC. Approval of such a course would require formal approval by the Faculty of Engineering (or the Engineering Curriculum Committee, acting as proxy) through the Engineering Faculty Document process.

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David Radcliffe

Epistemology Professor and Kamyar Haghghi Head of Engineering Education  
Chair, First-Year Engineering Curriculum Committee

FYECC — October 7, 2014 — Summary of options for the ENGR 141/142 – Science Selective policy.

| Option | Description   | Pros and cons (briefly)  | Next action (if chosen)  |
|--------|---|--|--|
| A      | Propose to retain the past and current practice of allowing ENGR 141/142 to meet the Science Selective requirement.   | Pro: maintains consistency and matches previous decisions of the faculty; allows for a full conversation with faculty as a whole to decide the appropriate plan.<br>Con: does not meet the concerns raised in the flag on EFD 35-14. Continues potential disadvantage to students interested in specific programs.   | EFD from FYECC. Draft is available, we should discuss, edit, and vote (if possible) today, and submit to ECC immediately.  |
| B      | Choose to stop accepting ENGR 141/142 as a Science Selective starting with students who enter in Fall 2015.   | Pro: no action needed, matches the current position of Assoc. Dean and ECC, acceptable to EFD 35-14 flagger.<br>Con: would require students interested in programs that require CS but not CHM (for graduation), to take CHM116 or CS 159 (with content duplication) to leave FYE.   | No further action needed.  |
| C      |   | [no longer under consideration]  |  |
| D      | Recommend revision of ENGR 141/142 to be 2cr. each, without content on programming; stop accepting ENGR 141/142 as a Science Selective beginning Fa15 entrants. | Pro: the most "school neutral" proposal; complete separation of the Science Selective from ENGR 141/142.<br>Con: would lose advantages of integration of engineering and programming work in ENGR 141/142; may cause problems with students earning needed Honors points; would be difficult to put in place in time.  | ENGR 141 and 142 were created by EFD 31-12, submitted to the Faculty jointly by the School of ENE and the FYECC. FYECC would refer the issue, with its recommendation, to the ENE Undergraduate Curriculum Committee for development of the new course documents for the revised ENGR 141/142. |
| E      | Revise the FYE Curricular Requirements to remove the Science Selective (Schools may make appropriate changes to graduation requirements needed, if any).        | Pro: would make FYE curriculum common; would allow individual schools to decide if they will accept ENGR 141/142 for programming requirements.<br>Con: would not change number of credits needed by students in programs that do not require CS 159; represents a major change in philosophy of FYE requirements; would require some schools to submit EFDs in response. | EFD from FYECC. Draft is available, we should discuss, edit, and vote (if possible) today, and submit to ECC immediately.  |
| F      | Discontinue offering ENGR 141/142.  | Pro: would re-integrate quality students into ENGR 131/132 sequence, raising quality of team experiences and work.<br>Con: loss of a quality offering for CoEHP students.  | No EFD is required. FYECC recommendation will be referred to the Head of ENE, who will take necessary administrative action.   |

## ENGR 141/142 and the Science Selective

Potential options for solving the issue — projected on the screen at the 9/9/14 FYECC meeting.

| Option                  | Description  | Brief pros/cons   |
|-------------------------|--|---|
| A: status quo           | Return to historical pattern.  | Would retain potential disadvantages for programs that do not require CS and their students.  |
| B: programming plus     | Retain current 141/142, but do not count as Sci.Selec.   | Would introduce disadvantages to programs that require CS and their students: student would need to either take CS (a duplicate course) or CHM (an additional course) to leave FYE. |
| D: revise 141/142       | Revise ENGR 141/142 to be four credits total, and not to include the programming material of CS 159                            | Would lose the demonstrated advantages of teaching programming in context of engineering.   |
| E: no science selective | Remove science selective requirement from FYE and allow schools to determine what graduation reqs (if any) that 141/142 meets. | Would not help programs that do not require CS, but also will not hurt those who do.  |

## First Year Engineering Curriculum Committee Minutes

October 7, 2014, 10:30am – 12:00noon

### Attending:

Representing the programs: Robert Bean (NE), Sean Brophy (ENE), Pat Brunese (IE), Jim Jones (ME), Eric Nauman (Honors), Martin Okos (ABE), Elliott Slamovich (MSE), Tammi Thayer (EEE)

Representing FYE: David Radcliffe (chair), Stephen Hoffmann, Billi Jennings

Notes submitted by Stephen Hoffmann

### Items and Committee Actions:

1. The committee had no corrections or changes to the minutes from Sept 9. Robert Bean moved to accept the minutes, Pat Brunese seconded; unanimous vote in favor of accepting minutes.
2. ENGR 141/142 and Science Selective issue:  
This issue has been on the agenda since April; David Radcliffe expressed that the goal today is to make sure that all questions about the various options are answered, and then to move forward with a recommendation from the committee and, if appropriate, the next action steps. David Radcliffe distributed a one-page summary of the remaining options (attached to these minutes). For the benefit particularly of new members who were not involved in the discussions in April, there was a brief discussion setting the context, providing some of the history for how the practice of accepting ENGR 141/142 as a Science Selective evolved, and revisiting the actions taken by the ECC and the FYECC through the processing of EFD 35-14 (which revised the FYE requirements) last spring.

There was a long discussion about ENGR 141/142, the approach taken in the course, and how the course material related to CS 159 material. Sean Brophy provided a clear explanation of the course objectives and methods, and Eric Nauman provided data and a literature reference (available on the FYECC Intranet site) that discusses the benefits of an integrated engineering-and-programming approach. Eric Nauman stated that these courses are unusual, and the approach makes Purdue a leader in the field.

There was some discussion about potential mechanisms for providing the benefits of integration of engineering and programming in fewer credits, so students could maintain a choice of Science Selective without excess credits, but it became clear that is likely not possible.

The committee reviewed the different program requirements relative to CS 159 and CHM 116: four programs require CHM but not CS (MSE, EEE, CHE, most of ABE); three programs require CS but not CHM (AAE, IE, ECE); three programs require both CHM and CS (BME, NUCL, some BE programs in ABE); and four programs have no specific requirements and accept either course (CE, CEM, MDE, ME).

To move through the options, David Radcliffe suggested a strategy of a series of recommendation votes: first a yes-no vote on option A (recommending continuing to count ENGR 141/142 as a Science Selective); then if no, a yes-no vote on option B (recommending leaving all courses as they are but not accepting ENGR 141/142 as a Science Selective); then if no a three-way vote on options D, E, and F as the appropriate change to make.

Jim Jones moved to make a recommendation for option A; Pat Brunese seconded. In the summary sheet, option A reads, "Propose to retain the past and current practice of allowing ENGR 141/142 to meet the Science Selective requirement." In the discussion of this motion, there was some questioning to representatives of the four programs that require CHM 116 but not CS 159 about the impact on their programs. For three of the four, there is some mechanism for students to use the excess credit from ENGR 141/142 elsewhere in degree requirements (the fourth program is MSE). The Committee recognized that there may be some disadvantage in recruiting, in student credit load, and in student course flexibility, for these four programs. The Committee also discussed the potential similar issues that may arise for students in other programs for Option B.

The committee then voted on the motion; because the committee was split, votes were recorded: In favor (6): Bean, Brophy, Brunese, Jones, Nauman, Okos. Opposed (2): Slamovich, Thayer. **The motion passed.**

In the interest of moving quickly and expanding the conversation as widely as possible as soon as possible, the committee immediately considered a draft EFD related to option A (the FYE staff had prepared draft EFDs for all options where an EFD would be appropriate). Robert Bean moved to approve the EFD; Pat Brunese seconded. **After some minor editorial changes, the committee voted 6-2 in favor of the EFD. The EFD passes.** For the record, in favor: Bean, Brophy, Brunese, Jones, Nauman, Okos. Opposed: Slamovich, Thayer.

3. Informational Items:

Stephen Hoffmann shared that the EFD passed at the last meeting (on course substitutions) has been released from ECC to the ELT review, which is scheduled to finish on October 9. We have not yet heard any concerns raised. He also shared that FYE will be accepting undistributed credit to meet the FYE requirements for the Oral Communication and the Written Communication Foundational Outcomes, provided the University Curriculum Committee (UCC) approves a particular undistributed transfer course as meeting the FO. The UCC has recently started a procedure, analogous to the evaluation for credit equivalence, to determine if an undistributed transfer course meets FO guidelines. The UCC will make these determinations, and FYE will recognize their decisions.

4. Allowing upper-level Science Selectives:

Stephen Hoffmann presented a situation where a transfer student has undistributed credit for a course similar to our Science Selectives. The relevant department is not willing to give the student credit for the Science Selective course, but does believe that the student's

previous experience is sufficient to warrant a pre-requisite override that will allow the student to take the next course in a sequence. The question for us is whether or not we will accept this upper-level course as meeting the Science Selective requirement. The Committee was inclined to say yes, but there is a need to work out policy details (e.g., what happens if the upper-level course is required for the student's major?). Stephen Hoffmann will draft a potential policy (or formulate policy questions) for discussion at a future meeting.

5. Roundtable: Two items:

- a. Transfer students: there was some discussion about the recent announcements from the President's and Provost's Offices regarding the increase in transfer students. This will be a larger conversation for the College in general, and for the Undergraduate Chairs, but FYECC will seek to keep informed and to offer perspectives as needed.
- b. International students: the committee talked about the continuing need to work on issues related to reading, writing, and listening skills of international students. This issue will also be brought before the Undergraduate Chairs, but FYE and the FYECC may have a special role to play as the point of initial contact. We may need to do further study of the issues and best practices, and work creatively to develop solutions and programs that may help.