

DAC Responses May 2009

To: Ron Larsen

From: Jim Hall, Member MSU CHBE Department Advisory Committee

Re: A few chores: MSU CHBE Department Advisory Committee

Concerning the assessment of your accreditation plan, I have the following additional input:

Item 1. CHBE Educational Objectives

After reviewing the alumni and employer survey data:

- It appears that the CHBE program is meeting the educational objectives.

Item 2. Ethics Case Studies (Outcome F)

From the student examples, I would score rubric outcome F as follows:

- Ability to analyze an ethical situation 3
- Awareness of AIChE Code of Ethics 3
- Awareness of their responsibility to work in an ethical and professional manner 2

Concerning the Outcome F scoring rubric, I find the rubric an effective scoring mechanism.

Item 3. Safety in Senior Design Reports

At the March DAC meeting we identified a deficiency relating to safety in the senior design reports. The design instructor took the following steps to address the issue:

The design instructor responded by moving safety lectures earlier in CHBE 412. A Design Report Guide has been developed to help students cover all required areas. A Safety section will be a required component of design reports from this point on.

- I have reviewed some of student design reports and determined that satisfactory steps have been taken to address the deficiency relating to safety.

Best Regards,

Jim Hall

Principal
Hall Controls, Inc.

Ron,

My feedback as follows:

1. CHBE Educational Objectives. It appears that the CHBE program IS meeting the educational objectives.
2. Ethics Case Studies. Case #1, Group 3 = $(2+3+2 = 7)$, Group 6 = $(3+3+2 = 8)$, Case #2, Student 1 = $(3+3+2 = 8)$.

Ethics Rubric assessment - It is difficult to determine from the written responses in the papers whether or not the student/engineer demonstrates ethical engineering work (score 3 = exceptional). Much easier to assess whether or not ethics was comprehensively considered & analyzed.

3. Safety in Senior Design Reports. Fish oil: score = 2/acceptable. Craft Brewery: score = 2/acceptable (would have been a 3 except for suggesting signs rather than mechanical guarding)

I'll be in Montana for the first 2 weeks of June - may drop by to say hello.

Best regards,
Julie

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Ron,

I'm still dealing with being the mom of a new baby and probably won't have time to look this over (and in my sleep deprived state you may not want my input. 😊) My apologies. Hopefully I will be more helpful in future.

Thank you for keeping me in the loop.

Rebecca Ortiz

Hi Ron,

So, we get a homework assignment!

With respect to meeting the CHBE educational objectives, I have reviewed the student, alumni, and employer feedback documents. I concluded that the surveys produced some important, objective feedback. There were no fair or poor rankings. Most of the responses were either good or excellent. While there were a few comments that indicated a desire for more specific skills, I saw no evidence of flawed preparation in the fundamentals. This seems fairly normal as we often tend to hope for a sharper specific tool for use to work on a specific problem. However, what is really desired is confidence that our fundamental understanding of the science and engineering will lead us in the right direction. Thus, I concluded that the CHBE program IS meeting the educational objectives of the program.

Some feedback on the Ethics Case Studies (Outcome F): I think the 0, 1,2, 3 scale is about right. I would prefer to see the top score of 3 be called "excellent" rather than "exceptional." Exceptional seems to imply rare to me, whereas excellence in ethical behavior is achievable by good number of us. I rated group 6 and student 6. Both of these scored 9 of a possible 9. I conclude that the CHBE program IS meeting the educational objective for awareness of the AIChE Code of Ethics, ability to analyze an ethical situation, and awareness of a graduate's responsibility to work in an ethical and professional manner.

Safety in Senior Design Reports: I viewed the Coal Bed Methane Water Treatment Project and the Coal to Methanol Projects. I rated both at level 2, "Safety awareness has clearly been part of the proposed design." Each could have been improved by emphasizing safety early on, for example, in the early summary. The report would point out that, like the economics, safety will be getting close scrutiny at every step of the way throughout the design, construction, and operation of the project to all of the stakeholders.

Regards,

John Berg

Here are my two cents. I have to say the Safety in design was a marked improvement over the reports reviewed earlier this year. Your focus in this area will provide great benefits when the students enter into industry.

I would probably be worth while reassessing the ethics rubric for a more realistic scoring measure. It is difficult to say someone routinely performs a task when only looking at a couple of reports.

Hope this helps, and thank you for your work.

Ben Mossman

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Item 1. CHBE Educational Objectives

- It appears that the CHBE program **IS** meeting the educational objectives.

Item 2. Ethics Case Studies (Outcome F)

Group 1

- Ability to analyze an ethical situation --> (3 Exceptional)
- Awareness of AIChE Code of Ethics --> (2 Acceptable, it is difficult to say if this is used routinely when the question is asked directly for this issue analyzed. Therefore, I can't say this is a 3)
- Awareness of their responsibility to work in an ethical and professional manner -->2 Acceptable

Group 3

- Ability to analyze an ethical situation --> (2 Acceptable, the major ethical problems were identified, but I thought the answers were weak on the subtle ethical problems required for a 3)
- Awareness of AIChE Code of Ethics --> (2 Acceptable, it is difficult to say if this is used routinely when the question is asked directly for this issue analyzed. Therefore, I can't say this is a 3)
- Awareness of their responsibility to work in an ethical and professional manner -->2 Acceptable

Group 5

- Ability to analyze an ethical situation --> (3 Exceptional)
- Awareness of AIChE Code of Ethics --> (2 Acceptable, it is difficult to say if this is used routinely when the question is asked directly for this issue analyzed. Therefore, I can't say this is a 3)
- Awareness of their responsibility to work in an ethical and professional manner -->2 Acceptable

Student 2

- Ability to analyze an ethical situation --> (3 Exceptional)
- Awareness of AIChE Code of Ethics --> (2 Acceptable, it is difficult to say if this is used routinely when the question is asked directly for this issue analyzed. Therefore, I can't say this is a 3)
- Awareness of their responsibility to work in an ethical and professional manner -->2 Acceptable

Student 4

- Ability to analyze an ethical situation --> (2 Exceptional, lacked understanding of subtleties)
- Awareness of AIChE Code of Ethics --> (2 Acceptable, it is difficult to say if this is used routinely when the question is asked directly for this issue analyzed. Therefore, I can't say this is a 3)
- Awareness of their responsibility to work in an ethical and professional manner -->2 Acceptable

Rubric:

I agree with Julie's comment on the rubric for Awareness of responsibility. I'd say the same for Awareness of the AIChE Code of Ethics for the reasons I state above.)

Item 3. Safety in Senior Design Reports

Benzene Remediation

3 Exceptional, Demonstrated understanding of basic process safety through use of HAZOP which was beyond just personal (slips, trips, and falls).

Coal Bed Methane Water Treatment

1 Marginal, Only discussed safety from a very high level and did not indicate specific process design elements for building an inherently safer plant.

Craft Brewery

3 Exceptional, This team recommended process related equipment beyond the use of procedural barriers, dependant on human intervention.

Ron:

Everyone else is so quick to respond, I feel tardy. Here ya go, though:

Just an overall impression for you and the rest of the faculty.....I was very impressed with the package as a whole (as always) and feel you guys are doing a great job overall.

1. CHBE Educational Objectives. It appears that the CHBE program is meeting the educational objectives.
2. Ethics Case Studies. Case #1, Group 1: $(3+3+2 = 8)$; Case #2, Student 3 $(3+2+2 = 7)$; Student 4 $(3+2+3 = 8)$; Student 5 $(2+3+3=8)$.
As far as the rubric goes, I think it is good enough to assess what you need here. It is clear that these students have in fact been taught the material, so we are trying to sort out relative ranking, not a more severe problem. Therefore this rubric is fine. To echo and add to Julie's comment, you'd really need to interview them to go to finer granularity.
3. Safety in Senior Design Reports. Benzene: score = 3/excellent. CO2 Sequestration: score = 2/acceptable. I actually thought they were both pretty good, especially the HAZOP portions. I had a slight impression that the Benzene folks took it a little more seriously.

Ron: I hope all is well with you and your family, and that I see you a couple of times next year to make up for my absences this year. I need to get out there and ski with Joe and Sara.

Regards,

Rod

Ron,

From the looks of my e-mail files it appears that I am late in getting this to you but here is my feedback for what it's worth.

CHEBE Educational Objectives

The objectives look fine. Having just gone through an ABET visit I looked at the information you provided in the manner that our visitor looked at ours. What our visitor was looking for was a direct assessment of whether our graduates were achieving the objectives. Most of the feedback I see from the students focus on what they did while at MSU and thus indicate how well your program outcomes were being met but not necessarily the objectives (results your graduates are expected to demonstrate after they leave MSU). The feedback from the employers was a much better source of information. From this information it would appear that the CHEBE program is meeting its educational objectives.

Ethics Case Studies

The rubric looks fine. The scores I would give are: ethical situation – 2, AICHE Code of Ethics – 2, responsibility – 3

Safety in Senior Design Projects

I took a look at four of the reports – those that look like they would have the most substantial safety concerns (e.g., methanol synthesis). The quality of the safety considerations was highly variable. I did like the inclusion of the HAZOP analysis. However, there were a number of superficial suggestions. I did not see an instance of where safety was built into the system. Most of the time it was suggested that a sensor be put into the system to detect the failure. How about a fail-open (or fail-closed) valve where appropriate to make the system fail-safe rather than relying on sensors (think of what happened at Three Mile Island). I would also like to have seen details given. Rather than just saying that personal protective equipment is needed, specify what equipment (ear protection, steel-toes shoes, respirators, air packs, etc.) is actually needed. Saying the operators need PPE is easy to write without really understanding what it means. What I saw was an improvement. In some cases the students did an excellent job; in others clearly more thought about safety was needed.

Dick Zollars

Original Message from Ron Larsen, asking for review

From: Larsen, Ron [mailto:RonL@coe.montana.edu]

Sent: Tuesday, May 26, 2009 12:56 PM

To: john.berg@chsinc.com; keck@gtsolar.com; ray@bendres.com; kgraham@unifield.com; mossbx@bp.com; jmmorman@mmm.com; Jim@hallcontrols.com; rzollars@che.wsu.edu; rebecca.david@sbcglobal.net

Cc: Thomas, Shelley

Subject: MSU CHBE Advisory Committe - More Assessment Stuff (sorry)

To: CHBE Department Advisory Committee (DAC) members

Fr: Ron Larsen

Re: A few chores...

Once again I am asking for some help in meeting the assessment obligations of our accreditation plan. There are three items that I would like you to assess within the next week or so:

1. CHBE Educational Objectives
2. Ethics Case Studies
3. Safety in Senior Design Reports

The data for review is available at www.chbe.montana.edu/DACdata/DACdata.htm. Student work is password protected, and the password will be sent in a separate message.

Item 1. CHBE Educational Objectives

In the past we have looked over the alumni and employer survey data, and scanned for problem areas. When no problem was observed, no comment was made. This has left me with no definitive statement as to whether we are or are not meeting our stated educational objectives. So, I'm asking you to take another look at the alumni and employer survey data, and then email me back with one of the following statements:

- It appears that the CHBE program IS meeting the educational objectives.
- It appears that the CHBE program IS NOT meeting the educational objectives.

- From the available data, I CAN'T TELL whether or not the CHBE program is meeting the educational objectives.

Item 2. Ethics Case Studies (Outcome F)

At the time of the DAC meeting in March, the student examples for outcome F were not available. I would appreciate it if you could take a look at the scoring rubric for outcome F, and a couple of the student examples, and then give me point values (from the scoring rubric) for the following rubric elements:

- Ability to analyze an ethical situation
- Awareness of AIChE Code of Ethics
- Awareness of their responsibility to work in an ethical and professional manner

Since this is the first time we have used the Outcome F scoring rubric, your comments on the rubric will also be very useful to me.

Item 3. Safety in Senior Design Reports

At the March DAC meeting you identified a deficiency relating to safety in the senior design reports. The design instructor took the following steps to address the issue:

[The design instructor responded by moving safety lectures earlier in CHBE 412. A Design Report Guide has been developed to help students cover all required areas. A Safety section will be a required component of design reports from this point on.](#)

I would like you to take a look at a couple of design reports and determine whether or not the steps we have taken have addressed your concern.

Note: This is a very specific assessment related to safety only, not an overall assessment of the senior designs. (You'll have other opportunities to do that.)

Again, I thank you for your time and effort. It is way too nice outside to be doing assessment chores – but I need to complete the self-study report by early June. If you cannot get to this in the next week, I will understand.

Thank you,

Ron

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