

Chemical & Petroleum Engineering Advisory Board Meeting

December 11, 2015

Present: Hertanto Adidharma, Vladimir Alvarado, David Bagley, Ken Baum, David Brinkerhoff, Dennis Coon, David Dandy, Stephen Ftaclas, Khaled Gasem, Mark Glover, Ramona Graves, John Greff, Joseph Holles, Patrick Johnson, Steve Jones (Support Staff), Joe Leimkuhler, Billy Lew, Richard Lynch, Rose Mizell, John Oakey, Rebecca Podio, Mary Shafer-Malicki, Doug Swenson, Michael Thomas, and Heather Warren (Support Staff).

Welcome and Introductions:

- Mark Glover opened the meeting and welcomed everyone. He welcomed new members; Michael Thomas and Billy Lew on the Chemical Engineering side and John Greff and Rebecca Podio on the Petroleum Engineering side. Dennis Coon was also introduced as the Interim Chemical Engineering department head.
- **Minutes:** Glover reported that the April 24, 2015 minutes were distributed and asked the board if there were any issues. Mary Shafer-Malicki motioned to approve the minutes and David Brinkerhoff seconded the motion. All were in favor.
- **Agenda:** Glover reported that the board will split the same as they did in April. He asked for any issues with the agenda. No comments were made and the agenda was accepted.
- **Departmental Split:** Glover went on to talk about the department split. He reported that this will be the last meeting where we work together. He said that it's important that we honor what needs to be done, especially with the department head searches. Michael Miller asked for an update for the new people as to what is driving this. Glover reported that when Petroleum Engineering was done away with, it lost its identity. This was not a good thing for UW and the college. He said that back in 2005 they decided to start it back up again. He said at that time it was not accredited yet. Brinkerhoff added that when he received his degree, it was back accredited after the department became accredited in 2009. Glover went on to report that when the market started getting crazy, this department grew by leaps and bounds. He added that Chemical Engineering grows as well, but it is stable.
- Dr. Hertanto Adidharma reported that when we were one department, the Administration could not see us as a small department with the number of faculty members being around 15. That would now allow the department to ask for more faculty as they would say that we have enough. He reported that the Chemical Engineering department would also like to focus more on Bio, for example. He said that being two departments will give us the ability to grow and will allow the names to be changed to enhance that.
- Doug Swenson asked if the faculty agree with the split. Adidharma replied that there are still some issues that need solved and that several faculty members would like joint appointments between the two programs. He reported that Dean Pishko will address this. Swenson also asked if the faculty are in agreement that the Advisory Board be segregated. Glover replied that it's a benefit to go ahead and make them independent versus keeping them together. Dr. David Bagley stated that it's important with two departments to have two boards. He commented that this board has done a great job over the years and now with the department split, it's good to have the board to respond to the different needs of each department. He added that from an accreditation standpoint, it's important that we have to get feedback from our boards. He said we can make sure we have the right constituencies for accreditation and it will be very helpful.
- Dr. Dennis Coon added that the accreditation requires each department get a unique voice coming back from the board and with a combined board, this would be a challenge. Adidharma added that we have to have program objectives from each side. He said that ABET will question if we only have

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one board. Swenson stated that we are here to serve the University and if the university requires that we split, there isn't much room for discussion. Glover suggested that it could also benefit each board to have meetings on similar days in case there is something that might need to be discussed together. Graves commented that the oil prices are hitting academics hard. She said there are 15 accredited Petroleum Engineering departments in the U.S. and that is small. Chemical Engineering has hundreds. She said that the PETE heads meet once or twice a year and they have unique problems. She said we need to think about what we are doing for the students. She said last year most universities had 90-95% job placement and this year we are less than 10% and jobs are being descended. She said we have upset and angry students and parents. She said the department heads got together with industry and talked about how to help the students and how to keep research strong. She said that in her mind, it's a logical split with these fluctuations.

- Lynch agreed that it's vital that the PETE student population stays healthy and strong. He said that we have got some tough sledding over the course and it's an opportunity. He supports the split. Ken Baum stated that he was here in 1974 when the department was the smallest department and by 1978, it was the largest. He said that when everything else is relatively stable, industry may not be and it's critical to separate and be robust. We need to talk about how we are going to manage and how we are going to keep it together.
- Dr. David Dandy commented that it's unusual for a department with two separate degrees having a single board. Each has their own agenda and have to work toward the common good. This is for accreditation purposes. He did say, however, that the department has had a board overseeing two programs and this is a complement to the department and the board.
- There was a motion to officially disband the Chemical & Petroleum Engineering Industrial Advisory Board and create two individual boards; one for Chemical Engineering and one for Petroleum Engineering. There was a second and all were in favor. The motion was approved.

College Updates (Dean Michael Pishko):

- Institutional Level: Dean Michael Pishko reported that this is a challenging time with a budgetary perspective. He said that the Craig Report came back with a \$160 million deficit for the fiscal year 2016 and a combined \$500 million deficit for the fiscal year 2017-2018. He reported that puts significant pressure on the state. He reported that Governor Mead enacted a hiring freeze for all state agencies for this fiscal year. He stated that they are working on ways of dealing with some of the deficits. They also have a large rainy day fund of \$300 million on mine lands funds which can come directly here.
- He reported with respect to the hiring freeze, UW has put in an extra layer of approvals. The department is currently hiring a department head in Chemical Engineering and 3 faculty positions in Petroleum Engineering. He reported that they had to get the approval from President McGinity and three senior administrators. They made the decision that there is a need for this and we were able to get that done. He said this is just an extra layer of approval.
- Pishko reported that UW will have to make cuts to come up with money for one time expenditures. He said they are pressing hard to do vertical cuts rather than across the board. That means identifying low-performing programs and eliminating faculty positions and relative staff positions in those departments. He said it's painful but it has to be done. Glover stated that it's a great way to refine and it makes the university stronger for programs that are underperforming.
- Pishko went on to report that the Legislature would love it if we were able to identify, eliminate and reallocate. Then in 2020, the funds could be reallocated. He reported that he testified at the Joint

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Appropriations in Cheyenne and for the most part, they are an ally of UW and particularly of Engineering. He said they are high on Tier I and on the Engineering building. He said that every agency and entity had those funds restored except for over the last couple of years. He said that UW is in need of a robust fiscal management system. Right now it's a hodgepodge of Excel quick books and we are about 25 years behind where other universities are. He reported that when they testified in Cheyenne, they are pushing for the state to fund this. They made a strong case that it needs to be funded. He said if they want us to be able to prioritize and reallocate, this is the baseline and you have to have these systems in place to understand what you are doing.

- Pishko reported that we have strong support for the building funding. He reported that \$4.5 million will be returned for the High Bay Facility and the Governor supports that. He reported that Tony Ross, Phil Nicholas, and Kermit Brown all support this and we've got the people in place. He added that we are about \$4 million short. He said they will break ground in 2017. They will continue to fund raise. The Trustees are supportive and he feels good about it.
- Pishko reported that the Tier I Initiative is untouched by the cuts at the state level. The \$8 million is there per biennium and that is good news for us. The other part in the Tier I legislation is that UW cannot decrease our portion or share. He said it's related to the legislation and we are protected from that. He said the Tier I Initiative is going well. He said that resources have been used to bone up student services and the Student Services Center. He reported that we now have a full time recruiter, full time career placement and a PETE advising Coordinator. He added that funds are also being used to correct the deficit in PETE faculty. He reported that they brought in Brian Toelle and Ken Baum and are looking to hire a few more people so that we can get that department to a healthy state.
- Pishko reported that the split was done through a memo. He reported that over the next year we will have to do reallocations at the college level to make the departments both healthy and sustainable. He added that we are hiring two staff positions for the PETE side.
- Pishko then reported that Engineering Scholars is recruiting some of the best engineering students in Wyoming. They look at an ACT score of 33 or over and an average of 26 coming into the college. These outstanding students may be provided an opportunity for study abroad, for example, to enhance their experience. He reported that 92% of these students are retained, which is great for us. He added that Tier I has also been supporting the WYSTEM program, which is the integration of STEM outreach programs at UW. This is done at the grade school and high school levels and are integrated with those at the college level and so we have a uniform effort where we complement each other. He also said that there is an English as a Second Language program on campus that supports a lot of our students and Tier I is providing funding to stand up that center for this current fiscal year. Then the center will be self-sustainable with student fees.
- Pishko reported that we are funding research that is relevant to Wyoming through Tier I. Some examples are unconventional, water, coal utilization, carbon engineering, and computational science. He added that we are engaged more with industry through Tier I. He said at the PETE level, they will be hiring a Drilling Simulator expert and they are embedding Professors of Practice in every department.
- Pishko reported that he's been tasked with coming up with articulation agreements with the community colleges in the state where they can take their first year or two at a community college and then transfer here. He said it's good for us politically and they are working on the articulation agreements now. Glover stated that one of the things the students wish they had is a greater network and the Professors of Practice idea can provide this. It's great. Graves added that this is an

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appropriate change and the board can also have an impact. Mary Shafer-Malicki asked if there is a way to think about how the entire college thinks about student services, about employability and reaching out to industry and providing services to the kids. Pishko replied that Ann Jones is doing a great work at the college level but he agrees we need to do better and we need to get the kids to look at alternatives. He's going to ask the board to help identify pathways for the students. He said in his own field, the U.S. Patent office was a good place to go. He said he needs to know about the employment problems. He spends a lot of time traveling and meeting people in industry and has no problem talking to them. Shafer-Malicki stated that she worries about the sophomores as well as the seniors. When they don't see the seniors getting jobs, then they may change majors.

Discussion Ensued

- Pishko stated that we need to tell the students that they really need to do an internship. The more we can convey that, the better. Glover stated that when things are tight, industry is going to start cutting and this puts students in a bind. He asked if there is a concept for an internship within the university setting. This is experience that can be put on a resume where a student could work a problem for industry, etc. Dandy asked if students coming out of the University of Wyoming would like to stay in Wyoming. Pishko replied that some do. Dandy added that in Colorado, they don't want to leave the state. Pishko agreed that employers do look at that and most students like to stay close to their families.
- Steve Ftaclos commented with respect to the Professors of Practice, if this has made a huge difference in our department and what is the actual effect on the head count now that we have put a label on it. Pishko replied that we had to go through Faculty Senate. Ftaclos asked if every department will get one. Pishko replied that he'd like to see every department have at least one Professor of Practice with the exception of Atmospheric Science. Bagley added that it came through the University T&P Committee and other colleges on campus stated that this could help them too. It's going to benefit the whole university. Dr. Vladimir Alvarado commented that he has worked with Toelle and Baum and they have done a great job.
- Richard Lynch asked if the Dean had any requests from the Board. Pishko replied that he looks for the boards at the department level to provide an assessment of the curriculum. He would also like the board to help the department establish more robust employment efforts and potential places of employment. Help the departments develop fundraising priorities and that would include corporate giving, endorsements, etc. He said that continuous engagements are needed to work with public institutions in states where they have major operations.

SWE Student Chapter (Attachment A):

- Ann Gibbons reported that they had about 60 people at their first meeting. They attended the National Conference in Nashville, Tennessee. They had a Career Fair with 500+ companies there which provided interview opportunities and 2 of their members were offered interviews from their internships.
- She reported that they worked with Teddi Hoffman to go to elementary schools and work with the students on math and science activities. They also have worked with Big Brothers/Big Sisters. She reported that they meet bimonthly. They worked with Ann Jones on a Resume Workshop. They have an industry panel to talk about professional careers in engineering and give tips on how to get

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your name out there and can help with networking. They are also hosting the student/faculty dinner and Dean Pishko will attend.

- Lynch asked what their annual budget is. Gibbons replied around \$1000 and then they get funding from other organizations to help go to Nationals. She said they just fundraise to help send students to Nationals. She said this is a really good experience and students can get a job out of it. Baum asked if they collaborate with the Rocky Mountain chapters and do joint activities. He said that the School of Mines has the largest group in the region and it might be good to collaborate. Gibbons replied this is a good idea and would help to build the chapter. She said that there is a President's call where the regional presidents get together and talk about what they are doing and about issues and ideas on how to help. Ftacilas asked if they get support from the college. Katie Hopfensperger replied yes and they hope to get enough funding to where they can take 12 students. Gibbons said they have received a lot of help from the college. Dandy asked when they do elections. Hopfensperger replied that they do them in March or early April. Then they can have a meeting where the old and new officers can meet together to transfer the information to them. Lynch asked how many women engineers are enrolled. Gibbons replied that they have 16%. Graves added that for the PETE side, one charge is to get more diversity. She suggested getting PETE officers and get engaged with those women. She said they should be able to send everybody to every conference and it could be an industry priority. She said you can grow your chapter this way. She said that Aerospace is always dying for diversity.
- Rebecca Podio recommended setting a different tone through SWE. She said when she was in school, SWE was an isolated group and the PETE women didn't want to be tied to it. She was glad to see that they are creating a more open and different attitude now. Graves complimented the girls and said they are doing an amazing job building the society.

Discussion Ensued

- Adidharma reported that we have funding to send students to conferences. Alvarado added that companies can also help. He can attach this information to a proposal to help students. There is more money out there. Podio added that she went to that first meeting for SPE as a freshman and then was involved ever since. She went to Anaheim as a freshman and then became an officer. John Greff added that they were told that they have to go to a student organization in their ES 1000 class. Swenson added that they are talking about a career skill set and the students have to do something to be successful. He asked if there could be some kind of requirement at the senior level course to write something up about how they can pick the organization. Alvarado said they have been talking about how to streamline Senior Design and have the companies working on senior design with the students. This would be the best of both worlds. Graves added that you can't require the students to join. They have got to have the passion and want to have the skills. When we've inspired them, they build the skill set of interacting, of leadership, and interpersonal relationships.

CHE and PETE Groups split.

Chemical Engineering Advisory Board Meeting:

Board Leadership Structure:

- Coon reported that the board will operate on their own leadership with support from the department. Shafer-Malicki suggested looking at what's worked well with the combined group. She recommended having a vice president just in case someone can't make it. Ftaclas added that we will have to come up with a new charter and need to elect new officers.
- Shafer-Malicki nominated Ftaclas as the Co-Chair. All were in favor.
- Ftaclas reported that John Myers will be retiring and the educational experience during his time here teaching simulation has been remarkable. Dandy stated that at CSU they don't have a Professor of Practice, they have Senior Teachers. He said that their Senior Design instructor is someone who retired after 30 years at BP and he has a PhD from Michigan. He said we need somebody like him. Dr. John Oakey added that Unit Operations and Process Simulation are important. Ftaclas suggested moving Simulation to earlier in the curriculum to gain that confidence earlier. He said that shows how important it is. Shafer-Malicki asked what the progression is going to be of Chemical Engineering and Bio and will it happen immediately. She feels this is important. She asked if there is a specific request to the Dean about this and suggested that it needs to be high on the priority list. Dandy asked about what the plan is for hiring new CHE faculty.

Status of the Department (Attachment B):

- Coon reported that he learned about the anticipation for the split back in August and the Dean had indicated to move the split forward due to the failure of the PETE department head search. He said that no potential department head wanted to walk into the mundane details of splitting with all of the unknowns. So he made a decision to split. Adidharma then went to the PETE head opening. The Dean then would look outside for a CHE department head and the Chemical Engineering department has been very gracious through the split. Coon has been encouraging them to think about the future and set their own path. He has issued an inquiry to the university to rename the department and the Dean is in support of that, but wants to split first. Miller asked if it is really a big deal to add the name biological. Oakey replied that when trying to recruit talent from a younger faculty, we now have 8 CHE faculty and 3 of those are bio-centered researchers. It's a good proportion of our faculty at the moment with no effort at all. He said that is indicative that stronger grad students and post docs who have an eye toward academia are going toward biological engineering. He said if we want to recruit top talent to CHE, we are going to have to do it through biological engineering.
- Miller asked what is the research in biological engineering and what makes it so enticing and how can we promote that as a strength. Dandy replied that Utah's bioengineering is a biomedical center. This includes biotechnology and biomedical applications. For undergraduate research, it drives a lot of undergraduate demands to see this availability in the curriculum. He said they went from 104 students in 2006 to 430 students today when they changed the name and add biological. He added that they have 50% female. Shafer-Malicki added that it opens the door to attract more students and it seems to be getting to be a higher demand. Miller added that the nuclear industry bioremediation are also big topics for them. Ftaclas also added that with bio, EOR is going to be a big thing in the next few years. He said the immediate benefit for us is that 50% are women and this is huge. He said it may just be a marketing thing. That is what some students see to get them into the door.

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Oakey added that when they move life sciences into engineering and into Chemical and Bioengineering, they could follow female students moving as an interest in the life sciences. Dandy agreed that they have been seeing this over years now and MIT leads the way. He said what they see is they bring in high school students in the fall and spring and they want to choose a major where they can make a difference. Oakey added that it really is rebranding and that traditional CHE is applied to a new context. Ftacilas added that when working in energy, it doesn't matter how much stock you throw at someone, the bio has a bit more perception of having a cutting edge and gives them an idea of doing something new.

Discussion Ensued

- Staffing: Coon reported that any faculty member that had been moved could request automatic adjunct status to the other side. He reported that 8 were left in Chemical Engineering. At the professor level, there is David Bagley and Maciej Radosz. At the Associate Level, there is David Bell, Joseph Holles, and Patrick Johnson. At the Assistant level, there is John Oakey, Dongmei Li and Karen Wawrousek. He reported that they need a CHE Department Head that is looking to the future of Chemical Engineering and where they want to go. He reported that John Myers has been around for a long time and he wants to retire. He has since indicated that this will be this spring. He would like to work as an adjunct. Coon reported that there are 4 staff in the original department that are shared by both departments today. This week they are going to open the search for their clones to go to PETE. It will open January 4th and will stay open for 2 weeks. They hope to have people in place the first week of February. Kyle Winkelman is necessary to CHE as he is the safety supervisor and this is important in CHE labs. He has not been on a stable source of funding and this needs to change because of the importance of safety. He has requested to be assigned to CHE. Knut Ortiz is infrastructure and with the simulation needs of PETE, their needs are greater for his skills. He asked to be assigned to PETE with some resources from CHE to support.
- Coon reported that 8 faculty members is a razor thin margin to implement the program as it sits. They hope to get Professors of Practice to help next year and the shifting in Unit Ops will be addressed. He said the new department head will decide.
- Operations: Coon stated that there needs to be some continuity. He does the overall administration. Patrick Johnson is the Undergraduate Coordinator and Joseph Holles is the Graduate Programs Director. Coon reported that he is handling the accreditation. He has not identified a successor for that and he will be doing that in a parallel mode with Mechanical Engineering. He said this is okay as there is a huge push toward consistency for accreditation.
- Status of the Split: Coon reported that the head search is moving forward slowly. He's encouraging anyone in the department to apply as there are people in the department who can take over. There is a question of joint appointments and he hopes to know about this early next week. He reported that joint appointments carry a serious amount of overhead and it's better to do adjunct status. This allows them to interact with graduate students and they can chair committees. They are not, however, part of the department governance and they are not required to provide teaching, but they can if they want.
- Shared Staff: See Slide.
- Support Budget: Coon reported that last year it was \$89,000 for both departments and this year it is expected to be approximately \$42,000. He said the foundation accounts are problematic as they are typically given as gifts to the combined department. They are going to have to go back donor by

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donor and the Dean will make an executive decision on how to split it. He reported that other accounts are also shared. They hope to have it figured out by next year.

- Critical Issues: Coon reported that the degree program has expanded and the smaller department has to cover the expansion. He said there is need for more frequent offerings of required courses but there is limited teaching capacity as it now sits. He reported that there is a limited number of graduate assistantships for the graduate degree program. These are for the support of the teaching mission. He reported that the staff is severely overloaded and the head search is moving slowly. Dandy commented that advising freshmen is pretty simple and suggested having staff advise the freshmen. Coon replied that the college has helped a little with this that if someone is below the math level and are not ready for Calculus I, they would come to the Dean's office for advising. Dandy replied that they have a key advisor who deals with advising for transfer students since they are so complicated. Shafer-Malicki asked when would be a practical timeline to get the department head in. Coon replied that his guess would be by the first of the fiscal year August 1, 2016, but more likely it'll be at the end of next fall semester.

Discussion Ensued

Undergraduate Program (Attachment C):

- Dr. Patrick Johnson reported that the university just changed to USP 2015. There is a seminar-based class (Freshman Seminar). This is university wide and it's a good mix of students. He reported that these changes caused a cascade of changes in the program.
- Revamped Curriculum: Johnson reported that the department retreated from Engineering Science courses. This includes Circuits, Statics, and Dynamics as well as ES 1060 (Computers), Fluids, and Thermodynamics. He reported that they felt that the Fluids and Thermodynamics didn't prepare the students properly for the Chemical Engineering courses. He reported that the department is still taxed to participate. They then separated Transport Processes into two courses and then COJO 2010 was added. He reported that in place of ES 1060, it was replaced with CHE 1005. This course will just be the lab section of that class.

Discussion Ensued

- Johnson talked about new directions including the possible name change. They will also start offering online courses next fall. They would like to see more computer programming capabilities. They would like get computational competency up as well. Ftaclas asked if Mat Lab is the standard they have to take. He commented that Mathcad is a perfect tool for explaining what you are doing. Johnson replied that the capstone class will provide interdisciplinary opportunities and some product designs. He reported that in the new building, there will be a Student Innovation Center that will provide opportunities and can encourage design materials and hands-on learning. It will be an active learning classroom. He reported that having mixed modes of teaching enhances learning.
- Ftaclas asked if they need anything for the Unit Ops Lab. Johnson referred him to contact David Bell. He said they do a lot of hands-on building.
- Program Improvements: Johnson reported that Academic Affairs initiated a program assessment. They came up with a list of skills the students should have. These have to be assessed during the preliminary exams and the final exams during the PhD. If they don't show progress in the preliminary

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exam, it will show progress in the final exam. He reported that we need to do better at tracking our current students.

Graduate Program (Attachment D):

- See slides. No minutes taken at this time.

AIChE Student Chapter (Attachment E):

- Sarah Scott, AIChE President, reported that one fundraiser they do is the Dinner with Industry. Miller asked her where they get their contacts. Scott replied from Ann Jones and Heather Warren.
- She reported that they went to the National Conference this year and talked about other fundraising ideas. They will also sell T-shirts and will go to the Regional Conference in Arizona this year. Dandy asked if they have a class representative from each class. Scott replied no, but they have talked about doing that to help them get involved. Dr. Joseph Holles added that there is now a freshman CHE class that will help get interest in this. He also thanked Scott for all of her hard work.

Department Update – Accreditation (Attachment F):

- Coon reported that he led the college for 2 years in 2003 and 2009 and he stepped in and lead in 2011. This round he was the point person for CHE, ME and ESE. He reported that ABET is every 6 years and it is technically up for 2016. The process starts fall 2014 with a self-study written and submitted by July 1, 2015. He reported that Bagley and Adidharma were the authors. Coon reported that he became involved in August and the department split was on the 18th and the evaluator commented on the 20th.
- Coon reported that the evaluator was the finest evaluator he's ever encountered as he was very detailed oriented. He was reasonable, clear in his questions, and clear in his exit comments. He reported that it was a spectacular experience. Coon reported that the evaluator started with a significant number of questions focused on the student transcript in ways he'd never seen before. Then the site visit was on October 25-26, 2015. Coon went on to talk about the timeline. There is an exit statement by the evaluators and at this point, you can correct errors of fact. They allow us to think about what should happen and the response will only occur after a final statement is received. He said we expect it before February 15, 2016. Then the Dean will have to respond that he's received it and we have 30 days to address the issues. He reported that supplemental materials will be submitted by May 10, 2016 and it will become clear the outcome.
- Previsit Issues: Coon reported that the evaluator reviewed student transcripts and from 6 students that were randomly selected, 4 of the 6 students had very detailed course sequencing questions. Coon said that they assume that this is representative of the entire student population. The evaluator has to show outcomes that are demonstrated with poor development of skills. CHE is a very linear program and each course is taught once per year. If a student stumbles, they are delayed graduation by one year.

Discussion Ensued

- Ftacilas stated with respect to prerequisites being out of order, it was a decision made by a qualified faculty advisor. At some point doesn't an advisor get some discretion? Coon replied that the evaluator never eluded to the fact to an approved prerequisite violation than a violation. If a prerequisite is important, inforce it, if not, remove it. Bagley added that they formalized it with

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paperwork to approve the waiver. From the evaluator standpoint, it didn't matter. Shafer-Malicki asked if you were to look at this in hindsight, would you change anything. Maybe offer the course twice a year and she asked what was learned from this. Coon replied two things. Look at a prerequisite and get rid of it if it's not mandatory. Shafer-Malicki commented that she likes the idea of trying to have classes offered as a recovery plan. Johnson added that we can offer classes over the J-term and in the summer. This is a way of helping the students.

- Dr. Khaled Gasem asked how many courses actually are critical where we have failure or delays happening. Johnson replied one and it has been removed. Coon replied that it's one in a sequence of 8 consecutive courses. If you miss any one of those, it's a year postponed graduation. Gasem added that one is causing a bottleneck and that is where we need to start. Ftaclas added that with respect to rigor, there needs to be a gateway course. Students failing Transport should not be Chemical Engineers. Bagley reported that in 2005 they dropped it from the 3rd year to the 2nd year and this has proved to be a good gateway course. Gasem stated that Phenom is tricky to teach to undergraduates and you have to ease into subject matter and get them over the hump. It takes good planning to teach the right way.
- Coon reported that the second issue was the lab budget plan. He asked about the details and then he did a tour. He reported that Dr. David Bell and Kyle Winkelman did a brilliant job with the tour.
- Then he asked about the budget versus enrollment (see slide). This has an impact on the operations of Chemical Engineering. He came from a CHE program. He understands the implications from explosive growth and there's not a lot you can do about it.
- The evaluator asked about how many faculty had participated in the UW-ECTL program and 5 of our 8 people had taken advantage of this and he was okay with this. Coon then talked about how each criteria is rated and talked about the compliance, deficiencies, weaknesses and concerns. See slides.
- Coon reported that we are in compliance of 4 of the 9 criteria with 0 deficiencies and 4 weaknesses. He said we have to address all 4 criteria to avoid an interim report. Ftaclas asked with regard to safety, where are we. Bagley replied that he teaches Process Control and he introduces safety and hazardous control. He stated that next semester we need to make sure that they do it as it's important. Billy Lew asked if there is safety focus on the environmental side as well. Bagley replied that he went to Joe Holles' class to talk to his class about environmental safety. This is part of continuous improvement and we are part way there.
- Coon reported that the Dean's Office has had a group from all over the departments for a year leading up to this visit. Every department had a minimum of 1 weakness. The Dean then got them all together and said we want a plan in place as to how everybody is going to address each issue. They want to manage it more tightly from the Dean's Office in the future. Coon wrote down a plan with action items as to what we can physically do to address each weakness.
- Accreditation Action Plan (See Slide): Coon reported that they will modify the prerequisites review, tighten the requirements on transfer courses, review CHE course prerequisites to remove unnecessary requirements and increase the frequency of CHE course offerings using creative solutions. They will also hold the department head accountable for prerequisite issues. They will also fully implement computerized check of degree requirements and conduct advising survey to clarify "uneven advising quality."
- Dandy stated that it was explained in their process that if the last point is only a concern to the evaluator, if one thing is a weakness, then everything is a weakness. Coon said we can argue that it's not really actionable. Bagley added that this is a chance for us to do the study and get the things

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done that we need to do. Gasem suggested as a potential solution to use one advisor for the upper division and one for the lower division. They will be drilled in all requirements and are very strict in how they approach things. Then the problem is solved. Then all students have the same type of advisement and it's uniform. Coon agreed that this could be a potential outcome.

Discussion Ensued

- Coon reported on Criterion 4 (see slide) where the Assessment Manager operates as a project manager. Modifying reports is pending. He said safety training is going to happen in the spring. Dandy replied that they spend two semesters on safety and organization in their classes. They spend a lecture talking about what types of things they are working on. The second lecture is 50 minutes of video and this is a freshmen class. That might be a right time to show this information to get them ready. Ftaclas stated that regarding risk assessment and analysis, if there is anything he can do to let him know.
- Lew commended that safety and environmental is such an important component in industry. He said they are finding problems in the work force these days with the lack of safety knowledge. He suggested touching on this topic earlier in the curriculum. He's afraid one course is not sufficient. Bagley replied that other courses can do the same thing and agreed that he's absolutely right. He said it can be shown in the syllabus. They really focus on it on two lecture times. Gasem suggested to invite an industrial type safety expert once a year every year to come into all research labs. Lew added that if we make that second nature for all of the graduates, that alone would make a huge impact of the quality of graduates.
- Coon reported on the last action item. He said the college is shooting for consistency in the amount of constituents on the advisory board. He would recommend the departmental faculty to be part of the board. Both the undergraduate program coordinator and the graduate program coordinator officially be part of the board and meet regularly as they are the ones who will implement the changes. That action item requires the board's approval.
- Coon added that many graduates and employers of graduates should be part of the board as well as the Presidents or Vice Presidents of AIChE be part of the board. Bagley stated that they are listed as exofficio.

Charter Revision:

- Board discussed charter revisions.

Action Item: Ftaclas to revise charter as per the recommended revisions by the board and will send out to the board for review.

Membership:

- Johnson recommended Jennifer Graves. She works with Sinclair. If she isn't interested, she can recommend someone. Ftaclas asked if anyone knew someone from Nobel. Bagley suggested asking John Myers. Lew recommended someone from Chevron; Randy Shaffer. He reported that his son is engineering at UW. Lew said he can send a note to see if he's interested. Shafer-Malicki said to ask him to send his CV if he's interested. Johnson will also send Graves a note. Ftaclas stated that there is a gap in our 0-3 year recent graduates on the board. Johnson stated that Melissa Dangal and Cami Andre would be good. Lew suggested getting someone from Simplot. Eddie Baker is from Simplot.

December 11, 2015

Meeting Adjourned.

Attachment A



The Society of Women Engineers

University of Wyoming 2015-2016

Officers

President: Ann Gibbons, ESE
Vice President: Katie Hopfensperger, CHE
Treasurer: Hannah Miller, EE
Secretary: Katie Ponta, ARE

Faculty Advisor: Dr. Ferre-Pikal, EE



Overview

2015 Fall Semester

- RSO Fair
- Cookie and Coffee Meet-and-Greet
- WE15 National Conference
- SafeTreat with AIChE
- Big Brothers Big Sisters
- Bi-monthly meetings
 - Interview/Resume Workshop
 - Industry Panel
 - Networking



Engage. Advise. Achieve.

Recruiting Events

- RSO Fair
- Cookies and Coffee Meet-and-Greet
- Classroom Presentations



Engage. Advise. Achieve.

WE15 National Conference



- Nashville, TN
- Funding for 8 members to attend
- Technical Presentations
 - Informational
 - Collegiate
 - Professional
- Career Fair
 - 500+ Companies
 - Interview Opportunities
- Special Thanks
 - UWEFE
 - CHE, PETE, and ARE Departments



Register | Abstracts | Exhibits

Outreach Events

- SafeTreat with AIChE
- Explore Engineering
- Big Brothers Big Sisters
- Teddi Hoffman
 - Engineering Panel
 - Engineering Girls Day



Register | Abstracts | Exhibits

Meeting Agendas



Bi-Monthly Meetings

- Networking
- Interview/Resume Workshop with Ann Jones
- Industry Panel
 - TriHydro
 - WYDEQ
 - University of Wyoming
- Nationals Presentation



Planning for the Future



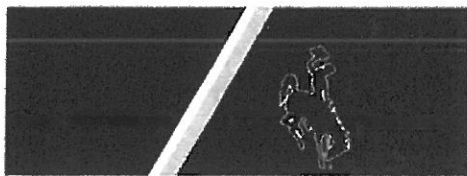
Events of 2016

- Engineering Week
 - Girls Day Panel
 - Potential Engineering Fair
- Fundraising
- Outreach
 - Book Drive (ASME)
 - Big Brothers Big Sisters
 - SWEnext
- Student Faculty Dinner
- Officer Elections





Attachment B



Department - Update

December 2015

Timeline



- Split of Chemical and Petroleum Engineering Effective August 18
- Petroleum Engineering – Hertanto Adidharma named Department Head
- Chemical Engineering – Dennis Coon named Interim Department Head
 - Borrowed resource from Mechanical Engineering
 - Appointment expire July 31, 2016
 - Search for CHE Department initiated, but behind schedule
 - Internal candidates encouraged to apply

Role if Interim Department Head



- Step into accreditation – very late in process
- Personnel
 - Finalize faculty
 - Protect staff
 - Promotion and Tenure processes
- Split
 - Populate all University and College standing committee
 - Propose AY16-17 budget
 - All necessary processes/procedures functioning for next head
- Departmental Vision
 - Leave for next Head in collaboration with faculty/staff

Staffing



Faculty (8)

- Bagley
- Bell
- Holles
- Johnson
- Li
- Oakey
- Radosz
- Wawrousek

Academic Professionals (1)

- Myers
(temporary)

Staff (4)

- Jenkins
(shared)
- Ortiz
(shared)
- Warren
(shared)
- Winkleman
(shared)

Operations



- Overall Administration
 - Coon, Jenkins, Oritz, Warren, Winkleman
- Undergraduate Program Coordinator
 - Johnson
- Graduate Program Coordinator
 - Holles
- Accreditation
 - Coon

Status of Split



- Personnel
 - Department Head search
 - Faculty split complete?
 - Questions on joint appointments and adjunct appointment remain.
 - Staff – shared
 - Two new staff positions approved for Petroleum Engineering – expected Feb 2016
 - Jenkins and Warren to Chemical Engineering
 - Ortiz – reports to Petroleum, but assists Chemical
 - Winkelman – reports to Chemical, but assists Petroleum
- Support Budget (state-funded)
 - Shared until accounts activated – expected soon
 - Current balance in question
 - Approx. \$42,000 expected AY16-17
- Foundation Accounts
 - Split expected early 2016
- Other accounts
 - Shared until account activated – expected soon

Critical Issues



- Undergraduate degree program
 - Recently expanded
 - More frequent offering of required courses
 - Expanded electives necessary
 - Very limited teaching capacity
- Graduate degree program
 - Limited number of state-funded GAs
- Other
 - Severely overloaded staff
 - Department Head/Staff searches moving slowly
 - Department Head with CHE background critical to appropriate vision of Department.

Attachment C

ChE Undergraduate Program

- 230 students
- Updated curriculum with USP 2105
- ABET Accreditation Results

Revamped Curriculum

- Retreated from Engineering Science Curriculum
 - ES 1060
 - ES Fluids
 - ES Thermo
- Separated Transport Processes into 2 courses
- Added COJO 1010
- Added First Year Seminar (FYS) – all university

New Courses

- CHE 1005 (1 credit) in place ES 1060 (3 cr)
- CHE 2060 – revamped from MathCad to MATLAB
- CHE Fluids
- CHE Thermo
- CHE Heat Transfer
- CHE Mass Transfer

New Directions?

- Department name change impacts
- Curriculum enhancements
 - Greater computer programming capabilities
 - Greater integration of MATLAB throughout
 - Capstone class
 - Interdisciplinary opportunities
 - Product design
- Student Innovation Center Opportunities
 - Makerspace
 - Student oriented machine shop
 - Student Entrepreneurship Center

Advisory Board Input

- Curriculum Review
- Student Recruitment
- Future Directions

Attachment D

CPE Advisory Board Meeting

Graduate Programs Update

(Courtesy of Joe Holles)
Graduate Program Director,
Chemical Engineering

December 11, 2015



UNIVERSITY OF WYOMING

Graduate Students

Graduated and In Progress

Year	Masters		PhD	
	CHE	PETE	CHE	PETE
2009	3	4	1	3
2010	3	2	0	1
2011	3	5	1	2
2012	2	1	1	3
2013	4	1	1	3
2014	6	6	7	7
2015	4	6	3	2
Enrolled	11	9	23	29



UNIVERSITY OF WYOMING

Graduate Students

Graduated and In Progress

Year	Masters		PhD	
	CHE	PETE	CHE	PETE
2009	3	4	1	3
2010	3	2	0	1
2011	3	5	1	2
2012	2	1	1	3
2013	4	1	1	3
2014	6	6	7	7
2015	4	6	3	2

Total In Progress F15 = 72 (+31% vs F12)



UNIVERSITY OF WYOMING

Graduate Students

Graduated and In Progress

Year	Masters		PhD	
	CHE	PETE	CHE	PETE
2009	3	4	1	3
2010	3	2	0	1
2011	3	5	1	2
2012	2	1	1	3
2013	4	1	1	3
2014	6	6	7	7

% Women: CHE = 26; PETE = 26

Total In Progress F15 = 72 (+31% vs F12)



UNIVERSITY OF WYOMING

Graduate Students

Graduated and In Progress

Year	Masters		PhD	
	CHE	PETE	CHE	PETE
2009	3	4	1	3
2010	3	2	0	1
2011	3	5	1	2
2012	2	1	1	3
2013	4	1	1	3
% Int'l: CHE = 53; PETE = 95				
% Women: CHE = 26; PETE = 36				
Total In Progress F15 = 72 (+31% vs F12)				



UNIVERSITY OF WYOMING

Program Improvements

- 2009-2010: Developed and implemented required courses for both graduate programs.
- 2011-2012
 - Developed standardized admissions criteria for both programs.
 - Graduate Mentoring award from Academic Affairs to develop a new class to better prepare graduate students for success.
- 2012-2013
 - Recruiting award from Academic Affairs to improve and expand efforts to recruit higher quality graduate students.
 - Second Mentoring award develop graduate student progress metrics.
 - Redesigned webpage to clearly specify admissions requirements and process along with acceptable progress metrics for graduate students.
- 2013-2014: Second Recruiting award from academic affairs.



Program Improvements

- 2014-2015
 - Third Recruiting award from Academic Affairs.
 - Initiated Program Assessment for PhD programs in ChE and PetE
- 2015-2016
 - Fourth Recruiting award from Academic Affairs.
 - Initiated Graduate Student Tracking effort.
 - Follow students and ensure they are meeting timelines.
 - Obtain data for program assessment.
 - Initiate Program Assessment for MS in ChE and PetE
 - Plan A/Thesis
 - Plan B/Non-thesis
- Program Split: Vladimir Alvarado is now Graduate Program Director for Petroleum Engineering.
 - We continue to coordinate on the tracking and assessment.

 UNIVERSITY of WYOMING



UWYO.EDU

Attachment E

AIChE



**CO-PRESIDENTS: SARAH SCOTT
& AARON CHEESE
VICE PRESIDENT: TIM GUNDERSON
TREASURER: WILLIAM DUNCAN
SECRETARY: JACOB WILLIAMS
HEAD OF CHEME CAR TEAM: WYATT KELLER**

Fall Semester



- ❖ **RECRUITING EVENTS**
- ❖ **DINNER WITH INDUSTRY**
- ❖ **SAFE TREAT**
- ❖ **AICHE ANNUAL STUDENT
CONFERENCE IN SALT LAKE
CITY**
- ❖ **CHEME CAR TEAM**

Dinner with Industry



- ❖ AT THE UW CONFERENCE CENTER
THE EVENING BEFORE THE CAREER
FAIR
- ❖ THREE COMPANIES AND THE
DEPARTMENT IN ATTENDANCE
- ❖ CHEMICAL AND PETROLEUM
STUDENTS
- ❖ ~50 REPRESENTATIVES AND
STUDENTS IN ATTENDANCE

Safe Treat

- ❖ ELEPHANT
TOOTHPASTE
EXPERIMENT
- ❖ HANDED OUT
CANDY
- ❖ BAG TOSS
GAME



National Conference



- ❖ RESEARCH PRESENTATIONS
- ❖ STUDENT CHAPTER AND CAREER DEVELOPMENT WORKSHOPS
- ❖ GRADUATE STUDIES AND CAREER FAIR
- ❖ NETWORKING
- ❖ BREWERY TOUR



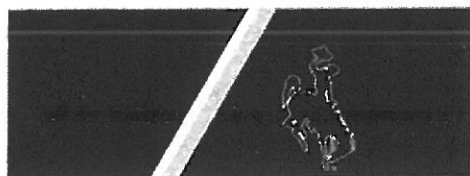
Next Semester



- ❖ **RESTAURANT FUNDRAISING NIGHTS**
- ❖ **CLUB GUEST SPEAKERS**
- ❖ **CLUB MIXER ACTIVITIES**
- ❖ **OFFICER ELECTIONS IN MARCH**
- ❖ **T-SHIRT FUNDRAISING**
- ❖ **REGIONAL CONFERENCE AT THE
UNIVERSITY OF ARIZONA APRIL 1-3**
- ❖ **ANNUAL NEW BELGIUM TOUR**

Questions?

Attachment F



Accreditation - Update

December 2015

Accreditation Timeline



- Self-Study submitted July 1, 2015
 - Authors were Hertanto Adidharma and Dave Bagley
- Evaluator – Prof. Emeritus Richard Zollars from Washington State University
 - Significant number of questions prior to visit on student transcripts, budget, and lab plan.
- Site visit Oct 25 - Oct 27
 - 13 members of visit team.
- Exit Statement – Oct 27
- Final Statement – expected between Jan 1 and Feb 15.
- 30-Day Response – address all issue identified with changes that are implemented or in progress.
- Supplemental materials – May 10 – submit CHE 4080 reports.

Pre-Visit Issues



- Student Transcripts
- Laboratory Budget/Plan
- Department Budget vs. Enrollment
- Educational workshops for faculty

Pre-Visit Issues



- **Student Transcripts** - 6 BS-CHE transcripts from Spring 2014 and Fall 2015 "randomly" selected for audit
 - One student graduated with insufficient grade in Calc III
 - Issue was traced to enforcement of grade rules in University Registrar's software
 - Issue corrected in September 2015.
 - 4 of the transcripts contained issues with prerequisite sequencing, and there were 12 total such issues identified
 - One student transcript contained 8 of the 12 prerequisite issues identified.
 - Evaluator point: If the curriculum is designed to provide a succession of skills and demonstrate student outcomes by graduation, failure to follow the curriculum lowers the probability of successfully demonstrating outcome.

Pre-Visit Issues



- **Laboratory Budget/Plan**
 - Recent updates in Unit Ops Lab
 - Planned updates in Unit Ops Lab
 - Resources for lab updates

Pre-Visit Issues



- **Department Budget vs. Enrollment**

Table 8.1 Department of Chemical and Petroleum Engineering Support Budgets

Fiscal Year (Fall of Academic Year)	Operating Funding	Undergraduate Enrollment		Funding per student
		PETE ^a	CHE ^b	
FY 2010 (Fall 2009)	\$ 75,448	80	144	\$ 336
FY 2011 (Fall 2010)	\$ 69,834	97	134	\$ 302
FY 2012 (Fall 2011)	\$ 71,823	143	158	\$ 239
FY 2013 (Fall 2012)	\$ 73,913	219	170	\$ 190
FY 2014 (Fall 2013)	\$ 73,913	309	187	\$ 149
FY 2015 (Fall 2014)	\$ 82,202	395	194	\$ 139

Question from Evaluator: How has trend above impacted Department's undergraduate program(s)?

Pre-Visit Issues



- **Educational Workshops for Faculty**
 - How many faculty have participated in UW-ECTL program?

Accreditation Process



- 9 accreditation criteria
- Each criteria presented in Self-Study
- Pre-visit questions clarify any questions on criteria
- Visit confirms compliance with criteria
- Each criteria rated
 - Compliance – no issues noted
 - Deficiency – single deficiency results in “show cause.”
 - Weakness – single weakness results in interim report
 - Concern – advisory with minimal consequences

9 Accreditation Criteria



- **Criterion 1 - Students**

- Student progress must be monitored to foster success in attaining student outcomes
 - Exit Statement: Four of six students were allowed to enroll in classes for which they had not completed the prerequisite classes (for some students there were multiple times that the prerequisite classes had not been completed).
 - Exit Statement: Students reported an uneven quality of advising
- The program must have and enforce procedures to ensure and document that students who graduate meet all graduation requirements.
 - Exit Statement: Student graduated without having received the required grade of C in a prerequisite class.
- Overall rating - WEAKNESS

9 Accreditation Criteria



- **Criterion 2 – Program Educational Objectives**

- Documented, systematically utilized, and effective process, involving program constituencies for periodic review of Program Educational Objectives
 - Exit Statement: The current Industrial Advisory Board...reviews the objectives periodically. Only five of six constituent groups are represented on the Industrial Advisory Board. Recent graduates have little to no input into review of program educational objectives.
- Overall rating - Concern

9 Accreditation Criteria



- **Criterion 3 – Student Outcomes**

- Documented student outcomes that prepare graduates to attain the program educational objectives
- Overall rating - Compliance

9 Accreditation Criteria



- **Criterion 4 – Continuous Improvement**

- Appropriate, documented processes for assessing and evaluating the extent to which the student outcomes are being attained. Evaluation must be systematically utilized as input for continuous improvement of program.
 - Exit Statement: While assessment results appear to have been acted upon, the process appears to be ad hoc and not clearly connected to assessment results. The lack of assessment data from the CHE 4080 class relative to student outcome (i) also support the finding that assessment results are not being systematically utilized for program improvement.
- Overall rating - WEAKNESS

9 Accreditation Criteria



- **Criterion 5 – Curriculum**

- Curriculum culminating in a major design experience based on knowledge and skills acquired in earlier course work and incorporating appropriate engineering standards and multiple realistic constraints.
 - Exit Statement: Multiple realistic constraints in the design experience were discussed with students. However, a review of the final reports from the capstone design class did not indicated how multiple realistic constraints were incorporated into the student design.
- Overall rating - WEAKNESS

9 Accreditation Criteria



- **Criterion 6 – Faculty**

- Sufficient in number and appropriate in skills to ensure students attain outcomes
- Overall rating – Compliance

- **Criterion 7 – Facilities**

- Classrooms, offices, laboratories, and associated equipment must be sufficient to ensure students attain outcomes
- Overall rating – Compliance

- **Criterion 8 – Institutional Support**

- Institutional support and leadership must be adequate to ensure quality and continuity of the program
- Overall Rating - Compliance

9 Accreditation Criteria



- **Criterion 9 – Chemical Engineering specific requirements**

- Curriculum must include the engineering application of these basic sciences to the design, analysis, and control of chemical, physical, and/or biological processes, including the hazards associated with these processes.
 - Exit Statement: A review of the final reports from the CHE 4080 capstone design class show a very limited recognition of process hazards and no consideration of the impacts of these hazards on the design of the process. Plans underway to incorporate SACHE in future CHE 4080 classes. Not yet implemented and may not be adequate.
- Overall rating - WEAKNESS

Exit Statement vs. 9 Accreditation Criteria

- Compliance – 4 criteria
- Deficiency – 0 criteria
- Weakness – 4 criteria
 - Priority #1!!! Address all 4 criteria to avoid interim report
- Concern – 1 criteria
 - Priority #2

Accreditation Action Plan



- **Goal of more consistency across college**
- **Weaknesses**
 - Criterion 1 - Students
 - Criterion 4 – Continuous Improvement
 - Criterion 5 - Curriculum
 - Criterion 9 – Chemical Engineering Specific
- **Concern**
 - Criterion 2 – Program Educational Objectives

Accreditation Action Plan



- **Weakness Criterion 1 - Students**
 - Action 1a – modify prerequisite review/waiver process utilizing Registrar's online system
 - Status – Implemented as test
 - Action 1b – tighten requirements on transfer courses
 - Status – Complete
 - Action 1c – Review CHE course prerequisites to remove unnecessary requirements
 - Status – in progress
 - Action 1d – Increase frequency of CHE course offering using creative solutions.
 - Status – In progress
 - Action 1e – Hold Department Head accountable for prerequisite issues
 - Status – In progress
 - Action 1f – Fully implement computerized check of degree requirements
 - Status – Complete
 - Action Item 1g – conduct advising survey to clarify “uneven advising quality.”
 - Status – In progress

Accreditation Action Plan



- **Weakness Criterion 4 – Continuous Improvement**
 - Action 4a – formalize responsibilities of Assessment Coordinator
 - Status – Temporary solution implement (Coon for AY15-16; may borrow part of Coon for AY16-17 and AY17-18).
- **Weakness Criterion 5 – Curriculum**
 - Action 5a – modify report requirement in CHE 4080.
 - Status - Pending

Accreditation Action Plan



- **Weakness Criterion 9 – Chemical Engineering Specific**
 - Action 9a – implement SACHE training in CHE 4080
 - Status – Pending
 - Action 9b – modify report requirements in CHE 4080
 - Status - Pending
- **Concern Criterion 2 – Program Educational Objectives**
 - Action 2a – Simplify list of constituents: *graduates, employers of graduates, current students, Departmental faculty*
 - Status – Pending (IAB approval necessary)