

**School of Biomedical Engineering,
Science and Health Systems
Academic Assessment and Quality Improvement Committee Meeting**

Meeting Minutes

Monday, November 26, 2018

Meeting: 2:05 p.m. – 3:25 p.m.

Bossone Research Enterprise Center, Room 709, Drexel University

Attendance: D. McEachron, J. Sarver, J. Dougherty, A. Shieh, C. Riley, and S. Detofsky

Action Items

- Create a single competency for freshman year to assess each pillar.
- Set up a revised sophomore competency faculty survey, where the faculty rank each pillar.
- Dr. Dougherty will look at quantitative co-op data.
- Dr. McEachron will look at qualitative co-op data.
- Modeling and Design → Dr. Sarver has an assessment.
- Biology assessment → Dr. McEachron.
- Computation → multiple assessments, especially regarding ability to plot data.
- Biomaterials → Dr. McEachron (reaction kinetics can be easily assessed).
- Biomechanics → Dr. Shieh will test students in BMES 345 (Mechanics of Biological Systems) at the start of Winter term → Free body diagram.
- Biosignals → Ohm's Law.
- Communication → Dr. McEachron → assess plagiarism (use online quizzes), including ethics → assess what level the students can present as part of a team, based on the appropriate year in the curriculum.
 - Did the student understand the terminology of the presentation?
 - Did the student explain the material in a clear manner?
 - Did the student complete the presentation on time?
- Any assessments imbedded in a given course will be contained in a library.
- Need to determine what the assessment tools will look like and then determine a consistent measurement.
- Need to determine a target threshold for each assessment tool (pass / fail) and be able to express how close we get to our target. Also need to determine an 'action' threshold (e.g., 40%), such that a change in the curriculum is needed if say, 40% of the students in a given course fall below this 'action' threshold.
- Mathematics and Design should be assessed / tested often.
- Need to come up with as many assessment tools as possible by the next Academic Assessment and Quality Improvement Committee meeting on Monday, December 10th. We will determine an assessment format at this meeting, also.
- Dr. Sarver will write up a report on his analysis of the senior design course.

Meeting Adjourned at 3:25 p.m.

**School of Biomedical Engineering,
Science and Health Systems
Academic Assessment and Quality Improvement Committee Meeting**

Meeting Minutes

Wednesday, January 9, 2019

Meeting: 2:05 p.m. – 2:50 p.m.

Bossone Research Enterprise Center, Room 709, Drexel University

Attendance: D. McEachron, J. Sarver, A. Shieh, A. Throckmorton, C. Riley, and S. Detofsky

Direct Assessment Data

- Direct assessment data is already available for all of the ABET criteria. Dr. Dougherty has been working on them. They should be available to the Committee members in the next two weeks.
- Dr. McEachron has assessed the co-op data. Co-op supervisor observations are direct assessments. Each co-op assignment yields ~200 to 300 comments (2 to 3 sentences long). Dr. McEachron is keying in the coding of this co-op data (supervisor comments only).
- Dr. Allen is looking at the concept inventories, which are all multiple-choice data.
- Faculty course evaluations and student course evaluations still need to be assessed. They must be put into an analyzable format; if not, then they will be sampled.
- Dr. McEachron will talk to AEFIS on Friday, January 11th to see how this data can best be exported for assessing and readability.
- Assessment of faculty course evaluations should focus on the 400-level courses (including senior design), since we already have the student course evaluations, etc.
- Dr. Throckmorton will wait to receive the faculty course and student evaluations from Dr. McEachron.

Student Course Evaluations

- Need to assess and look at how the students rate how well the course objectives were achieved or met. Students are asked in their student course evaluations how much they learned regarding the course objectives.
- Direct assessments, senior exit interviews, faculty course evaluations, student course evaluations, co-op data, concept inventories, etc. are collected data that, when we show how this data was used, is our example of quality improvement.
- Regarding the competencies, we will determine which we are going to assess and what tools we will use to assess them. Dr. McEachron will take a look this weekend at the competencies and will then begin mapping them.
- Course imbedded assessments are best placed in the design course sequences, so as to have a more uniform approach to assessing amongst the faculty.

Senior Exit Interviews

- Dr. Shieh looked at the senior exit interview data, with a numerical rating of 1 through 5 (5 being the highest percentage of satisfaction). This data is more quantitative, with results showing the students were not satisfied with our classrooms (40% dissatisfied) and computer facilities (less than 50% satisfied). The library and lab facilities fared better, with ~60% satisfied. This is data we can use.

Banner Data

- Dr. McEachron will talk to AEFIS about downloading Banner data regarding each classroom's equipment status (e.g., projector and other audio-visual availability). Then we can compare this info with the senior exit interview comments regarding facilities to improve and/or correct any issues.

Meeting Adjourned at 2:50 p.m.

**School of Biomedical Engineering,
Science and Health Systems
Academic Assessment and Quality Improvement Committee Meeting**

Meeting Minutes

Wednesday, January 16, 2019

Meeting: 2:15 p.m. – 2:55 p.m.

Bossone Research Enterprise Center, Room 709, Drexel University

Attendance: D. McEachron, A. Shieh, A. Throckmorton, C. Riley, and S. Detofsky

ABET

- Collect, collate, and analyze assessment data
 - Senior exit interviewer (in progress).
 - Co-op supervisor (in progress).
 - Embedded direct assessments (in progress).
 - Faculty course evaluations.
 - Student course evaluations.
 - Survey (spatial abilities, etc).
 - Apply results to justify the new curriculum.

- Data for 400-level courses (from AEFIS – Dr. Throckmorton will work on these.)
 - What did the students not know and were the prerequisites adequate?
 - What kind of comments did the faculty make in their faculty course evaluations? (Dr. Throckmorton will look at these for the last three academic years.)
 - How well did we achieve the course objectives according to the student course evaluations? Want to look at answers from students regarding what they knew before and after they took the course.
 - Facilities data (Dr. McEachron will provide Dr. Throckmorton an email address for Dan Saltzman at AEFIS).

- Concept inventories
 - All multiple choice and available via Blackboard Learn (Dr. Allen)

- Spatial abilities
 - As part of a new University funded study on virtual reality, we can possibly come up with some new information regarding a survey of the spatial abilities of students.
 - We could then develop a spatial abilities intervention to help students with issues in this area.
 - This is the kind of data that ABET also likes to see.

- New curriculum
 - Finalize faculty driven competencies (in progress).
 - Determine assessment targets via faculty survey (in progress).
 - Map competencies to the following: (Dr. McEachron will make suggestions as to what may be missing.)
 - Curriculum (in progress).
 - ABET criteria.
 - Drexel Student Learning Priorities (DSLPS).
 - Uncover gaps / missing elements.
 - Develop methods for eliminating
 - Determine appropriate assessment methods/tools for designated competencies and professional skills.
 - Develop appropriate assessment strategies for designated competencies and professional skills.
 - Previous curriculum was assessed for ABET a-k criteria (for the upcoming visit), while the new curriculum will be assessed for the new ABET 1-7 criteria.

- We need to show that the data that we are now collecting maps into both the old and the new curriculum.
- Self-study report
 - We would like to have a draft report completed by March 15, 2019.
 - Completed self-study report is due to ABET by July 1, 2019.
 - ABET site visit is October 31, 2019.
 - Carolyn Riley will forward the self-study template to Dr. Shieh.
- Blackboard (Bb) Learn
 - Faculty who put all of their assignments and exams in Bb Learn will not have to provide physical copies of these items, since ABET prefers to access this data electronically. Some items not in Bb Learn still need to be scanned and then put into Bb Learn.

Meeting Adjourned at 2:50 p.m.

**School of Biomedical Engineering,
Science and Health Systems
Academic Assessment and Quality Improvement Committee Meeting**

Meeting Minutes

Wednesday, January 30, 2019

Meeting: 2:05 p.m. – 3:10 p.m.

Bossone Research Enterprise Center, Room 709, Drexel University

Attendance: D. McEachron, J. Sarver, A. Shieh, A. Throckmorton, C. Riley, and S. Detofsky

ABET

- Collect, collate, and analyze assessment data
 - Senior exit interviewer (in progress)
 - Co-op supervisor (in progress) – Dr. McEachron will have this data by the time of our next meeting. We can reduce the number of learning indicators. Life-long learning assessment can be embedded in co-op and therefore does not have to be assessed within the curriculum.
 - Embedded direct assessments (in progress) – Dr. Dougherty is working on these assessments.
 - Faculty course evaluations
 - Student course evaluations
 - Survey (spatial abilities, etc.)

- Data for 400-level courses
 - Dr. Throckmorton looked at all of the 400-level courses for the last three academic years (2016-2018). For the same three years, she also looked at the faculty course evaluations. Most faculty felt that the course prerequisites were satisfied. One exception was signal processing preparedness, which the new curriculum addresses.
 - Dr. Throckmorton also looked at the facilities data, with which the students seemed mostly satisfied, with a good amount of 3s and 4s, and just a few 1s and 2s, on a scale of 1-5.
 - Dr. Throckmorton will look at the main themes and will prepare a histogram for the data from the faculty course evaluations for the fall, winter, spring, and summer terms of 2015-16, 2016-17, and fall of 2018, and will look for year-to-year improvements in the data. She will also look at the student course evaluations for the same years and terms. The learning indicators can then be mapped to the ABET a-k criteria.
 - Course catalog learning indicators are fixed, while faculty can add their own or subtract those of the previous faculty that had been previously added when he or she taught a given course.
 - We should collect all of this data each cycle (e.g., every 2 years) and look at any outlying data, as part of what would basically be a curriculum peer-review operation. We should then report this information to the full faculty on a yearly basis in some form of an annual report, with the goal of collecting just enough data that informs us enough to improve the curriculum. We do not want to be swamped with data and the time it would take to collect all of the data.
 - Faculty members should look at the student course evaluations to improve their respective courses. This data could eventually be tied to the faculty activity reports.
 - Q: How can we streamline this process to provide data to the faculty in such a way that it would be easier to complete the ABET self-study? Dr. Throckmorton will look at the students knew before and after the data regarding faculty course evaluations for the a-k criteria.

- Freshman Year Competencies / Learning Indicators
 - Math – Ability to model a physical process using differentiation and integration.
 - Modeling and Design – Ability to understand solution depends on constraints.
 - Biology – Demonstrate knowledge of central dogma of biology.
 - Computation – Ability to create a basic computer program with loops, switching, functions and data file import and export.
 - Biomaterials – Demonstrate knowledge of reaction kinetics (order of reaction). Contingent on being in CHEM 101 / 102 / Alternative – demonstrate knowledge and utility with chemical stoichiometry.

- Biomechanics – Ability to create a free body diagram.
- Biosignals – Demonstrate basic understanding of electric circuits (Ohm's Law).
- Communication – Demonstrate understanding of plagiarism.

- Sophomore Year Competencies / Learning Indicators
 - Math – Ability to solve a 1st and 2nd order ordinary differential equation.
 - Modeling and Design – Ability to use a mathematical model to determine requirements and / or specifications for a design.
 - Biology – Ability to identify and describe the interaction and regulation involved in gene expression.
 - Computation – Ability to translate specific instructions into an algorithm that appropriately processes input and output and generate correct analyses.
 - Biomaterials – Ability to describe how the atomic structure of materials relate to and/or generate physical properties.
 - Biomechanics – Ability to solve kinetic (forces and moments) and kinematic (linear and angular position, velocity and accelerations) equations to solve two-dimensional mechanical problems.
 - Biosignals – Ability to solve parallel and series passive electrical circuit problems.
 - Communication – Ability to read and determine design requirements from journal publications.

Meeting Adjourned at 2:50 p.m.

**School of Biomedical Engineering,
Science and Health Systems
Academic Assessment and Quality Improvement Committee Meeting**

Meeting Minutes

Wednesday, February 6, 2019

Meeting: 2:05 p.m. – 3:00 p.m.

Bossone Research Enterprise Center, Room 709, Drexel University

Attendance: D. McEachron, J. Sarver, A. Shieh, A. Throckmorton, C. Riley, and S. Detofsky

ABET

- Pre-Junior Year Competencies / Learning Indicators

Year	Pill	Q#	QID	Descript	Avg	Med	Rank	AAQIC	HOW?
1- FR	Biology	6	Q6_2	Demonstrate knowledge of central dogma of biology: DNA -- RNA -- Protein				App	BIO 122 / term 3
1- FR	BioMaterials	8	Q8_3	Demonstrate knowledge of reaction kinetics (order of reaction)				App	CHEM 101 / term 1
1- FR	BioMechanics	9	Q9_1	Ability to create a free body diagram				App	PHYS 101 / term 2
1- FR	BioSignals	10	Q10_3	Demonstrate basic understanding of electric circuits - Ohm's				App	PHYS 102 / term 3
1- FR	Communication	11	Q11_3	Demonstrate understanding of plagiarism				App	UNIV R101 / case study (embed)
1- FR	Computation	7	Q7_1	Ability to create a basic computer program with loops, switching, functions and data file import and export				App	BMES 201 / term 1; (pre-test / BMES 101)
1- FR	Math	1	Q1_4	Ability to model a physical process using differentiation and integration				App	MATH 121/122; term 1/2; (pre-test / BMES 102)
1- FR	Modeling & Design	5	Q5_2	Ability to understand solution depends on constraints				App	BMES 101 / Term 2; (pre-test BMES 102)
2- SO	Biology	6	Q6_2	Ability to identify and describe the interaction (replication, transcription and translation) and regulation involved in gene expression	2.7	3.0	1	App	
2- SO	BioMaterials	8	Q8_1	Ability to describe how the atomic structure of materials relate to, and/or generate, physical properties	2.6	3.0	1	App	
2- SO	BioMechanics	9	Q9_2	Ability to solve kinetic (forces and moments) and kinematic (linear	2.8	3.0	1	App	

				and angular position, velocity and accelerations) equations to solve 2-dimensional mechanical problems.				
2-SO	BioSignals	10	Q10_1	Ability to solve parallel and series passive electrical circuit problems	2.9	3.0	1	App
2-SO	Communication	11	Q11_1	Ability to read and determine design requirements from journal publications	2.5	2.5	1	App
2-SO	Computation	7	Q7_1	Ability to translate specific instructions into an algorithm which appropriately processes input and output and generate correct analyses.	2.9	3.0	1	App
2-SO	Math	1	Q1_2	Ability to solve a 1st and 2nd order ordinary differential equation	2.9	3.0	1	App
2-SO	Modeling & Design	5	Q5_2	Ability to use a mathematical model to determine requirements and/or specifications for a design	2.6	3.0	1	App
3-PJ	Biology	6	Q6_2	Demonstrate a basic understanding of homeostasis in physiological systems	1.4	1.0	1	App
3-PJ	BioMaterials	8	Q8_1	Demonstrate understanding of conservation laws - mass balances	1.4	1.0	1	App
3-PJ	BioMechanics	9	Q9_1	Demonstrate knowledge of stress-strain fundamentals - Hooke's Law	1.7	1.0	1	App
3-PJ	BioSignals	10	Q10_1	Demonstrate the ability to build a basic electric circuit	1.9	1.0	1	App
3-PJ	Communication	11	Q11_2	Demonstrate the ability to speak concisely and plainly	1.5	1.5	1	App
3-PJ	Communication	11	Q11_3	Demonstrate the ability to write concisely and plainly	2.0	2.0	2	App
3-PJ	Computation	7	Q7_3	Demonstrate the ability to write software that applies mathematical knowledge (Linear Algebra, Differential Equations)	2.5	2.5	2	App
3-PJ	Math	1	Q1_1	Demonstrate understanding of the basics of hypothesis testing (at least student t-test, 1 way ANOVA)	3.1	3.5	1	App
3-PJ	Math	1	Q1_5	Demonstrate the ability to execute and interpret the Fourier transform	3.3	3.0	2	App
3-PJ	Modeling & Design	5	Q5_2	Demonstrate the ability to build (fabricate) a design prototype	1.6	2.0	1	App
4-JR	BioSignals	10	Q10_1	Ability to obtain valid measurements from a physiological system.	2.0	2.0	2	App
4-JR	BioSignals	10	Q10_2	Ability to identify the source and physiological characterization of	1.0	1.0	1	App

			biological signals.					
4-JR Communication	11	Q11_3	Ability to recognize and effectively communicate with diverse audiences.	1.4	1.0	1		App
4-JR Math	1	Q1_2	Ability to design a scientific experiment to adequately test a hypothesis.	2.2	2.0	1		App
4-JR Math	1	Q1_5	Ability to use appropriate differential equations to analyze feedback and stability in various systems.	3.0	3.0	2		App
4-JR Modeling & Design	5	Q5_1	Ability to identify a relevant, unmet biomedical need of appropriate scope.	1.0	1.0	1		App

- Modeling and Design – Ability to understand solution depends on constraints.
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- Sophomore Year Competencies / Learning Indicators
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Meeting Adjourned at 2:50 p.m.

**School of Biomedical Engineering,
Science and Health Systems
Academic Assessment and Quality Improvement Committee Meeting**

Meeting Minutes

Wednesday, February 13, 2019

Meeting: 2:05 p.m. – 3:05 p.m.

Bossone Research Enterprise Center, Room 709, Drexel University

Attendance: D. McEachron, J. Sarver, A. Shieh, C. Riley, and S. Detofsky

ABET

Mapping the Competencies

- Dr. McEachron will take the 85 competencies that were determined by the faculty at last fall's faculty retreat and will associate them with the learning indicators, which include the ABET 1-7 criteria and the Drexel Student Learning Priorities (DSLPs).
- There are 32 competencies that have been vetted by the Academic Assessment Committee on a year-by-year basis (i.e., horizontally across the curriculum), but not yet on a pillar basis. We want to make sure that the pillars are adequately covered, so we will do this at the next meeting. For now, Dr. McEachron will map the 32 competencies with the learning indicators (instead of the full 85) to see what we have covered, especially regarding the ABET 1-7 criteria.

Freshman Year Competencies Assessment

- We have already determined (and posted on SharePoint for this committee) how, or where in terms of courses, we are going to assess the freshman year competencies.
- BIO 122 (term 3) – Assess using online quiz outside class and the molecular biology concept inventory to assess BIO 122 in term 4, via Socratic Method (~30 minutes answering multiple choice questions) / Assess in BMES 202 (term 4, week 1).
- CHEM 101 (term 1) – Assess using online quiz (freshman progress exam) and Socratic Method (in less than 30 minutes) / Assess in BMES 241 (term 5, week 1).
- PHYS 101 (term 2) – Assess using online quiz (freshman progress exam) and Socratic Method (in less than 30 minutes) / Assess in BMES 241 (term 5, week 1).
- PHYS 102 (term 3) – Assess using online quiz (freshman progress exam) and Socratic Method (in less than 30 minutes) / Assess in BMES 202 (term 4, week 1).
- UNIV R101 (term 1) – Assessment type is case study (embedded) via UNIV R101 course (term 1).
- BMES 201 (term 1) – Assessment type is embedded pre-test via BMES 202 (term 4, week 1).
- MATH 121/122 (terms 1/2) – Assessment type is embedded pre-test via BMES 102 (term 3, week 1).
- BMES 101 (term 2) – Assessment type is embedded pre-test via BMES 101 (term 2, week 10).

Sophomore Year Competencies Assessment

- BIO 218 (term 5) – Assess using online quiz (progress exam) via Socratic Method (less than 30 minutes).

- ENG 220 (term 4) – Assess using online quiz (progress exam) via Socratic Method (less than 30 minutes).
- MEM/BMES 238 (term 5) – Assess using online quiz (progress exam) via Socratic Method (less than 30 minutes).
- ECE 201 (term 4) – Assess using online quiz (progress exam) via Socratic Method (less than 30 minutes).
- BMES 101, 102, 241 – Embedded (in class)
- BMES 241 – Embedded (term 2 – in class)
- BMES 202 (term 4) – Embedded (in class)
- MATH 210 (term 2) – Embedded (in class)

Meeting Adjourned at 3:05 p.m.

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- MATH 210 (term 2) – Embedded (in class)

Meeting Adjourned at 3:05 p.m.

**School of Biomedical Engineering,
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Wednesday, March 13, 2019

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Attendance: D. McEachron, J. Sarver, A. Shieh, C. Riley, C. Glaser and S. Detofsky

Co-op Evaluations / Strengths as Indicated by Supervisor Comments – 2014-15

- From the supervisor comments of the co-op evaluations for AY 2014-15, the area of Human Resources Interactions showed the students' greatest strengths (~100 comments). The area of Lifelong Learning was second in showing the students' greatest strengths, with ~75 supervisor comments. The co-op supervisors even went out their way at times to indicate that, even when a student displayed a certain weakness, the student showed an ability to learn, which could easily result in another 10 or so positive 'strengths' comments.
- This co-op assessment is a great instrument for assessing ABET criteria #7 (Lifelong Learning). We can perhaps use this co-op supervisor evaluation of our students as an assessment tool in a more computational manner going forward.

Action Items

- CHEM 101 (General Chemistry I) – Demonstrate knowledge of reaction kinetics (order of reaction) and stoichiometry are covered in CHEM 102 (General Chemistry II).
- Math courses are properly assessed and covered after looking at the course syllabi (e.g., MATH 210 – Differential Equations).
- We still need to look at the syllabi for the statics and biology courses in the curriculum. Dr. McEachron will obtain the syllabi for three biology courses.
- Dr. Sarver will talk to Brian Brecker in the Office of the Registrar about courses taught in different programs, especially regarding prerequisites.
- Faculty Course Evaluations – We also want to look at these and try and make them as quantitative as possible, so they get used by the faculty and are as little onerous as possible.
- Student Course Evaluations – These will be restructured to provide a more computational way of assessing this information.
- Dr. McEachron will talk to the people at AEFIS about creating pop-up reminders for faculty to assess a certain competency each time a faculty member submits his or her course syllabus to the AEFIS system.
- Dr. Sarver will look at BMES 101 (Introduction to BMES Design I – Defining Medical Problems) regarding the students' design knowledge.
- Next week's meeting on March 20, 2019: 1. Content inventory for biology 2. How can we assess co-op information? 3. What information do we want to get out of the students? (and what information is dispensable, as well)

Meeting Adjourned at 3:05 p.m.

**School of Biomedical Engineering,
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Meeting Minutes

Wednesday, March 20, 2019

Meeting: 2:05 p.m. – 2:55 p.m.

Bossone Research Enterprise Center, Room 709, Drexel University

Attendance: D. McEachron, J. Sarver, A. Shieh, and S. Detofsky

AEFIS – J. Sarver

- Dr. Sarver looked at the AEFIS system and could only retrieve the course learning objectives. Some bugs seem to exist. Dr. McEachron will discuss any known bug issues with the people at AEFIS. There seems to be an access problem, where we can only “see” Biomed information regarding course syllabi, but not the syllabi of courses our students take in other departments throughout the University.
- Dr. Sarver created a spreadsheet regarding which course syllabi still need to be accessed or obtained. He will send this spreadsheet to Carolyn Riley with cc to Dr. McEachron to verify what still needs to be obtained.

Mapping of Competencies to Courses

- BMES 432 (Biomedical Signals and Systems) is now a pre-junior year course. We will keep the same course number for now, but we need to make sure that the student advisors convey to the students that the new curriculum plan of study has meaning and that the students are strongly advised to adhere to it.
- There are 86 competencies to be mapped to 61 courses.
- BMES 101 (Introduction to BMES Design I) – This freshman year course is a good place to plant the seed regarding future design in advanced courses.
- We still need to get biology and physics course syllabi.
- Dr. McEachron will update the concept inventory for biology (12 questions).

Meeting Adjourned at 2:55 p.m.

**School of Biomedical Engineering,
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Meeting Minutes

Wednesday, April 17, 2019

Meeting: 2:35 p.m. – 3:55 p.m.

Bossone Research Enterprise Center, Room 709, Drexel University

Attendance: D. McEachron, A. Throckmorton, J. Dougherty, J. Sarver, C. Glaser, C. Riley, and S. Detofsky

Continuous Improvement Criterion

ABET Self-Study – The 2019-2020 self-study template and guide are now in SharePoint.

Attainment Level of Outcomes – We need to focus on having at least 75 percent of the students meeting or exceeding expectations of outcomes, with 'proficient' being our School's expected level of attainment. When our students graduate, do they meet the expected outcomes? This is ABET's focus.

ABET Symposium – J. Dougherty

Assessment Processes – Dr. Dougherty attended a recent ABET symposium and observed that a lot of attention was paid to overly complex assessment processes of some institutions. ABET is not so much concerned about a particular expectation being met as they are about a plan being in place to address any possible deficiencies that might exist in the curriculum. ABET wants to know what our process is, as well as our target expected level of attainment. Another theme at the symposium seemed to be that there was a lot of data being obtained, but not necessarily being analyzed.

Self-Study Report – The Self-Study Report that is due at the end of June (with first draft done by the first week of May) does not need to have lots of details. It should not overwhelm with too much information, but just needs to be clear. We need to make sure the details of the process of the Self-Study content is available for the ABET site visit in September.

Assessment Frequency

We do not need to assess all outcomes (e.g., outcome 1 – design) every year. It is best to assess on an every other year basis for each outcome. For now, we need a listing and description of assessment processes (e.g., co-op employer/supervisor survey results, course imbedded assessments, etc.). We need to list our assessments while showing two transitions: 1) to the new revised curriculum and 2) to the ABET 1-7 criteria, since these two transitions coincide in our School's case.

Reporting Outcomes to ABET

Assessed Competencies – The faculty previously met and had determined a subset of competencies (out of 86 in total) to be assessed. We need to report to ABET at the outcomes level (i.e., criteria 1-7). ABET's main concern is that, if the curriculum has a problem or issue, we need to show we have a process in place to correct it. Having a problem and not knowing it or addressing it would be a red flag for ABET. Being clear about changing anything at the program level is more of a priority for ABET than any changes at the individual course level. We changed our curriculum and also changed the way we assess it, as we went from assessing intellectual pathways in the old curriculum to assessing competencies within the pillars of the revised curriculum.

Writing the Self-Study

Approach – A chronological timeline approach to writing the Self-Study report in outline form with linkable bullet point items is the approach we will use. Tables showing what we were doing and how we did it would be added to the Self-Study template. The final Self-Study report will be composed primarily of bulleted items and tables. It is critical to show ABET what we were doing before in terms of our curriculum improvement and assessment and what we were doing after.

Data – In the Self-Study, we only need to show data for the old curriculum, along with a clear plan that all of the curriculum outcomes are measured at some point (we have a chart showing this). Data for the revised curriculum and the old curriculum must be available during the ABET visit this Fall.

Direct Assessments

Ending Direct Assessments – Direct assessments will be considered to have ended as of this past winter term. In its place, we will begin assessing competencies via the ABET 1-7 criteria starting this spring and summer terms, with a focus on design and math. Data will be available for the ABET reviewers to access via AEFIS and Blackboard Learn.

Action Items

- The Academic Assessment and Quality Improvement Committee voted unanimously in favor of turning off the current direct assessments approach in AEFIS as of the current Spring Term in AY 2018-2019.
- Dr. Dougherty will forward the competency mapping information (showing the mapping of a particular competency to a particular course) to Dr. Shieh so he can organize this data into tables that will then be uploaded to SharePoint. These tables will be included in the final Self-Study report.
- Carolyn Riley will forward to Dr. Dougherty the analysis of the ABET a-k material that was completed by Jim Mitchell, Associate Dean for Undergraduate Affairs.

Meeting Adjourned at 3:55 p.m.

**School of Biomedical Engineering,
Science and Health Systems
Academic Assessment and Quality Improvement Committee Meeting**

Meeting Minutes

Wednesday, April 24, 2019

Meeting: 2:30 p.m. – 3:45 p.m.

Bossone Research Enterprise Center, Room 709, Drexel University

Attendance: D. McEachron, J. Dougherty, J. Sarver, A. Shieh, C. Riley, and S. Detofsky

Drexel Student Learning Priorities (DSLPs)

We do not have to link the DSLPs to ABET.

ABET Criteria

Lifelong Learning – This will be assessed through the co-op employer/supervisor surveys. We need to know what is being assessed and where it is being assessed, to be displayed as columns in the ABET curriculum map.

ABET 4 and ABET 5 Criteria – We need to add to these outcomes to make sure they are adequately covered, and also need to do things at the program level that are meaningful.

Competencies Mapping – Dr. Shieh has mapped the top 30 of the 86 competencies that the faculty had agreed upon during last fall's faculty retreat. We do not have to assess all 30 of these competencies every year, though ABET 1 criterion is important enough that should at least assess this one every year. The 30 competencies must meet the ABET criteria 1-7, and we must make sure these criteria and outcomes are adequately covered. A needs analysis should be done in class, as well as for co-op.

Continuous Improvement Criterion

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Meeting Adjourned at 3:45 p.m.

**School of Biomedical Engineering,
Science and Health Systems
Academic Assessment and Quality Improvement Committee Meeting**

Meeting Minutes

Wednesday, May 8, 2019

Meeting: 3:05 p.m. – 4:30 p.m.

Bossone Research Enterprise Center, Room 709, Drexel University

Attendance: D. McEachron, J. Dougherty, J. Sarver, A. Shieh, C. Riley, and S. Detofsky

Curriculum and ABET Faculty Meeting on Tuesday, May 14, 2019

Purpose of this Meeting – This meeting is to review with the faculty where we stand with our Self-Study report for the fall ABET accreditation visit, as well as other curriculum matters. At this meeting, we also need to formally adopt the competencies that the faculty had previously approved and discuss the intellectual pathways currently in play to transition to the ABET 1 – 7 criteria.

Assessment Structure – We need to determine how to deal with the assessment structure regarding the old curriculum, including content posted online. We should be able to use the same assessment structure for the new curriculum, since there is a strong correlation between the ABET a – k criteria from before and the newer ABET 1 – 7 criteria. We have assessments for all of the courses for AY 2018-19, plus the upcoming senior exit interviews and senior design assessments to cover the ABET a – k criteria. We need to explain why we are transitioning everything to the new curriculum.

Design Criteria – Our students have shown more satisfaction and improvements regarding the design criteria since the transition to the new curriculum had begun. They are also requesting more of a broad exposure and context regarding the biomedical engineering design experience. This is not a real problem, since study abroad could help in this area. The students have asked for current solutions to real-world and global biomedical engineering design problems, as well. One way to address this would be through a needs analysis in co-op and also requiring the undergraduate students to attend our School's weekly graduate student seminars.

Lab Techniques – The senior exit interviews have revealed that the students feel they need to learn more lab techniques, as well as how to analyze data in different aspects of the industry. We can address this issue by reducing the credit load in the new curriculum, so the students would have more flexibility in their schedules to be able to take certain elective technical skill courses. We will provide a list of such courses to the students. Surveying our alumni approximately nine months out from graduation would help determine whether this is a more persistent problem or just a single point in time, since much of the technical skills they need are learned on the job upon graduation anyway. Fortunately, ABET only requires that we assess, evaluate, and apply, not that we necessarily fix every problem.

Challenge: Assessment Tool Revision – At the faculty meeting this coming Tuesday, May 14th, the faculty will be asked to vote on ending the current direct assessment approach and begin a new targeted assessment with more objective measures, where we do not measure every assessment every year, as our new direct assessment approach hereafter. This approach will result in the transitioning from a rubric-based to a competency-based assessment. Rubrics in the past were not measuring the skills that the faculty deemed most important.

Challenge: New Plan – Collect assessment data in one co-op cycle and analyze the data in the other co-op cycle. Our target of competency is for 75 percent of our students to reach proficiency. This target of 75 percent will be set with periodic reviews, or as needed, per the request of the Academic Assessment and Quality Improvement Committee.

Academic Year (AY) 2013-14 and 2014-15 University Course Catalogs

Dr. Sarver reviewed the AY 2013-14 and 2014-15 course catalogs to check for any inconsistencies between the courses listed in the catalogs and our concentration area templates. The University's

implementation of CourseLeaf addressed this problem with the course catalogs, thus resulting in an improvement with fewer inconsistencies.

Reducing the Number of Credits in the Concentration Areas

Dr. Sarver found that the old curriculum's concentration areas had become too constrained, with too many laboratory credits. By reducing the number of credits within the concentration areas of the new curriculum, there is more flexibility within the concentration areas themselves.

Criterion 5 – ABET Tables

All curriculum options for the old curriculum will be available online, with a sample set of tables in the Self-Study report.

How Courses are Determined to be Engineering, Math, or Science Course in the New Curriculum

If the students are not learning any new math or science principles in a course, but they are applying math or science principles to the course content, then that course is an engineering course. If the students are learning math or science principles in a course, then the course is a math or science course, respectively. All of our senior sequence courses are considered engineering courses, unless the course name indicates specifically that the course is a math or science one (e.g., statistics is a math course).

Meeting Adjourned at 4:30 p.m.