



## Panel 2D ABET and Assessment

**Description:** Capstone Design is required for ABET accreditation in most engineering programs. This panel will discuss ideas for assessing capstone projects in ways that will satisfy the needs of both ABET and the programs themselves.

**Facilitator:** Nathan M. Kathir – George Mason University

**Panelists:**

1. Rachel Horenstein – University of Denver
2. Joshua Gargac – Ohio Northern University
3. Gregory Watkins – California State University Chico
4. Alexis Gillmore – University of Tennessee, Knoxville

**Notes:**

Nathan: retired from industry and now is a capstone hobbyist, 25 school visits with ABET, 10-11 international visits

Alexis: Graduate Teaching Assistant at University of Tennessee, Knoxville

Greg: Chico State, department chair, 15 years with CS Chico, 10 years with industry, Mechanical, Mechatronic and Manufacturing Engineering; recently completed ABET reaccreditation

Joshua: 7th year teaching @ Ohio Northern, 2016 Capstone Conference helped him improve

Rachel: wrote up the ABET self-study

Nathan: “ABET is like floating down a river as a leaf waiting for someone to fish you out”

**Advice** - Have someone in the dept. sign up to be a PEV to get an inside view

Alexis: Alignment of course content with student learning outcomes (most are ABET)

Greg: Open to share, help you with your concerns over ABET. Thoughts on how to do less assessment going forward

Joshua: Previous institution handled b-k and 1-7 criteria 3 outcomes to assess in capstone to now at ONU have very limited ABET

Rachel: ABET often seen as jumping through hoops, trying to look at it from how the assessment can be used to improve the course/curriculum



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**Question:** What is the most challenging part of the site visit?

Joshua - The lead up was the most challenging: compiling information leading up to visit is tough. Physical copies->digital takes time., forgot about some assessments that had been done previously

Greg: Writing the self study (SSR), coordinating the visit and schedule, had to redact student names from pdfs (tip: have student workers do this)

Challenge: Faculty buy-in: Viewing ABET as not “just one more thing to do”

**Question:** What is the best way to prepare for evaluation of interdisciplinary capstone?

Answer - The Criterion 5 is the same, but pay special attention to Program Criteria.

*Subquestion:* How do we provide faculty mentors with instructions/information for proper assessment?

MASTER DOCUMENT with Rubrics (Assign a committee - College-level curriculum committee for example)

Capstone structures for interdisciplinary teams:

1. Students sign up for course within their discipline, but come together for the project; ABET measures occur within the departmental courses, not the interdisciplinary course
2. Students take a common interdisciplinary course, course designers negotiate with individual departments over what ABET outcomes need to be measured; project scope negotiations need to include opportunities to show specific discipline-specific program criteria are being met (i.e. if an aerospace engineering student is on the team, does the project address at least 2 of the following aspects: CFD, Structures, Controls, Flight Systems, Launch Systems, ...)

**Question:** How can you assess individuals when the project relies on group work?

- Add individual meetings/assessments
- Assess electives that satisfy the criteria.
- Leverage peer assessment

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- Small individual presentations highlighting key technical contributions
- Have each group member write at least one test specification and get evaluated; team has to incorporate all of the specs in their design report
- Have students film themselves on a presentation (their parts only or the entire team presentation—be careful that you don't create busy work for the faculty mentors)

**Question:** Best practices for acting on the data collection?

- Chair review of instructor reports -> faculty meeting dedicated to review -> curriculum committee, etc. (have meeting minutes that documents the process)
- SO 1-7 Assessment reports -> Assessment Committee - > action items for indiv. Instructors
- Allow time to observe changes

Tangent: Help! 20% of students failed in a semester.

Possible Action: Add review sessions or recitations/ Mentor new faculty/ support tutoring?  
Look for individual instructors making drastic changes. Have a chart/table or document that guides faculty.

**Question:** Can external mentorship factor into ABET evaluation?

Course coordinator should guide team advisors, prune “less engaged advisors” as necessary. External stakeholders can act as ‘diverse audience’ for Criterion 3.  
Add QR codes on the student posters for the Expo and have the audience (peers, faculty, industry, staff, etc.) evaluate the presentation of the poster (did the team: communicate, engage, answer questions, etc.)

**Question:** How many outcomes should be assessed in Capstone (is it common to assess 1-7)?

Best practice: Assess each SO 1-7 in *at least 2* courses, capstone can be one of them.

**Caveat for interdisciplinary programs:** Identify how certain assignments overlap with what individual programs need (SO 1-7 and Program Criteria). Need to have an information system that can extract the SO subsets that are needed for each program.

**Pro tip:** Have teams fill out a table of applicable standards and constraints. (CR 5)

**Question:** When aggregating assessment from different courses, how do you account for differences among particular course content?



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ABET may not be picky, but differences in performance may be useful for the program to identify -> implement improvements.

**Question:** Continuous Improvement: What is it? What is “improvement” and how do we demonstrate CI?

Systematic analysis and assessment about a specific component of the program over time.

Address acute and chronic issues with appropriate actions via committees/curriculum changes.

Is Capstone the end of a “supply chain” for programs?

Use Senior exit surveys, Advisory Board review AND regular data to demonstrate CI.