

TRESTLE/ASSETT Special Interest Group (SIG) Spring 2019

Aligning your curriculum: *Aligning courses and goals for the major*

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About the group

Facilitators

Stephanie Chasteen (Center for STEM Learning) and Amanda McAndrew (ASSETT)

Stephanie Chasteen is an experienced faculty developer and researcher, focusing on supporting faculty in incorporating evidence-based practices into their teaching. Amanda McAndrew is the faculty services portfolio manager in the Arts and Sciences Support of Education through Technology (ASSETT) group, and is expert in instructional design.

Group description

Do you want to develop program learning goals for your department or major? Do you have program goals, but they are not intimately driving the courses and curriculum? Do you want to try to align your particular course with the learning goals for the major? In this Scholars group, we will discuss the difference between course learning goals, and program level student learning outcomes, and practice writing them. We will discuss strategies for getting departmental buy-in to mapping the curriculum, facilitating discussions, how to identify a student's flow through the major, alignment between courses, creating a coherent major, and how to visualize the mapping. You will get practice and feedback in your own mapping during the course of the semester.

Group members

1. **Teresa Foley** (Integrative Physiology)
2. **Janet Casagrand** (Integrative Physiology)
3. **Andrew Martin** (Ecology and Evolutionary Biology)
4. **Cheryl Pinzone** (Ecology and Evolutionary Biology)
5. **Sarah Sokhey** (Political Science)
6. **Lisa Dilling** (Environmental Studies)

Meeting agendas

All meeting agendas and materials are in the shared [Google Document](#). Access granted upon request.

Pre-SIG meetings (before the full SIG began): Spring 2018

1. Informational session
2. Drafting program level learning goals
3. Learning from UW La Crosse

SIG meetings: Fall 2018 and Spring 2019

1. **What is curricular mapping?** Drafting an action plan, creating a sense of urgency, and identifying your vision.
2. **What do you want to map?** Discussing the types of goals you want to map, skills vs. content, learning about the CMAC syllabus crawl tool from Geology.
3. **Building consensus in the department.** Discussion of change models, looking at example maps, learning from the stories of different geology departments, what support is needed.
4. **Planning for the future.** Discussing wishlist with CTL director Kirk Ambrose, planning for the next steps in your department.

Worksheets and frameworks used by the group

Our shared [Google Drive folder](#) is available by request.

How to map	Folder with useful literature and papers about mapping (link) Learning Opportunities Worksheet for consensus on PLOs (link) Writing learning goals page from SEI (link) Course Material Auto Coder (CMAC); contact E. Fairfax (link) Ideal student exercise for identifying program values (link) Exercise for writing PLOs with other faculty (link)
Examples	Value statements (<i>not for distribution</i>) (link) Program level learning goals (<i>not for distribution</i>) (link) Program level learning goals in Physics – p.17 (link) Curriculum maps and matrices (<i>not for distribution</i>) (link) AGI webinar on department processes and change (link)
UW La Crosse	Assessment plan (<i>not for distribution</i>) (link) Case study in Phys21 (link)
Change processes	ADKAR model (link) Huffington Post: Leading change (link) Kotter’s 8 stages of change (link)

Initial action plan template

- 1. Vision.** Articulate your personal vision of why you are engaged in curricular mapping: How do you want your department to be different as a result of this work?
- 2. A sense of urgency.** What is the reason for working on curricular alignment NOW? What crises or practical drivers might motivate people to engage? Think of a time when people in your department aligned around a single idea that inspired them to do something new. How might you find such inspiring shared goals for curricular alignment? [Read more about creating a sense of urgency here.](#)
- 3. Guiding coalition.** Who is part of your curricular alignment team? What are their positions? Do you have adequate credibility, leadership, expertise, and power on the team? If not, how can you engage such people in your cause? How will your team stay engaged?
- 4. Goals and concrete plans.** Given what you have written above, what are some concrete goals and actions that you have for the 2018-2019 academic year? These goals should be things you can actually accomplish, and preferably will include things that are critically important, as well as things that are motivating and easy to accomplish (“small wins”). You may wish to include plans for gathering necessary information from faculty about their courses.

Plan for each semester

Task	Detail	Is this a small win?	Is this highly critical?
Task 1			
Task 2			

Final action plan template

1. What was your original goal?
2. What is your current goal?
3. How has your goal changed during the past year of our SIG, or what have you learned?
4. What has been the biggest challenge?
5. What are three things you would like to do in the next year?
6. What are three resources or collaborations you will need in order to accomplish those?
7. What could TRESTLE or ASSETT or this group provide you?

Flowchart of curricular alignment

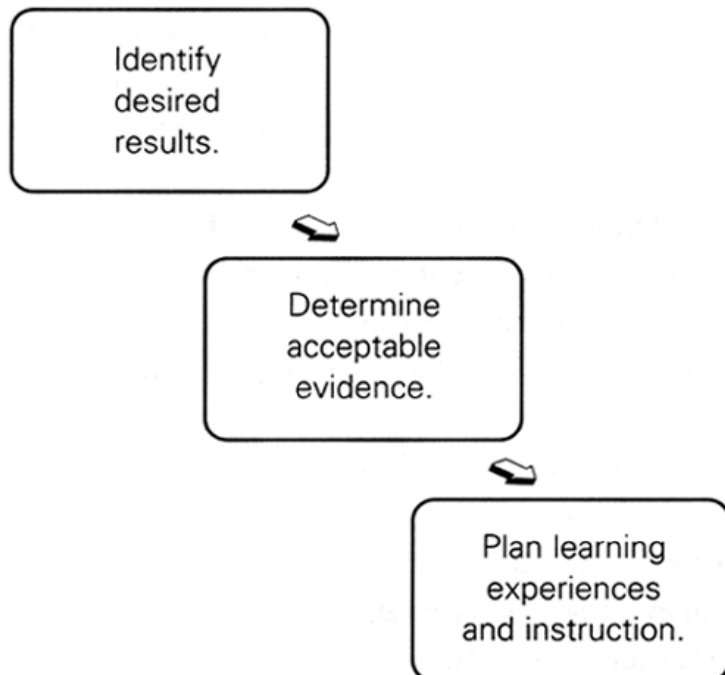
This flowchart is intended to document the process that was discussed (and discovered) in the group, with relevant resources.

[Google doc link](#)

What is curricular alignment?

Curricular alignment is the process of aligning a program curriculum with its' goals. It is a part of a high-level backwards design approach to the design of an entire curriculum. In backwards design, one starts by defining the learning goals (in this case, the program level learning outcomes). Those goals then drive the design of assessments and of the educational intervention (in this case, the curriculum itself).

A key document created in this process is a curriculum map, a spreadsheet of matrix identifying which courses are responsible for addressing, and assessing, specific PLOs. A curriculum map allows for a better understanding of the curriculum, and more deliberate design of that curriculum to achieve the desired outcomes, by identifying strengths, gaps, and redundancies.



Stages of backwards design ([credit here](#))

What are the steps to mapping the curriculum?

Below are the steps required to actually map out the curriculum. While this could be done solo, this is not likely to result in actual curricular changes, so we also show where departmental engagement is likely important. While it is ideal for the mapping process to be done as part of a faculty group with an external facilitator, we leave it to the reader to determine how these steps might look for their particular structure.

	Mapping the curriculum	Engaging the department	Resources
Initial exploration and scope	Become familiar with the process, terminology, and some examples	Introductory presentations and discussions with faculty and administrators	Curriculum by design AGI webinar on curricular revision case studies
	Identify the problem that is being solved by this project. What are you trying to do, what is driving you to do it, and what would success look like?	Commitment from administrators, with time allocation and incentives for faculty team	Integrating quantitative skills (paper) SERC “Strong programs” website
	Determine scope: Will you align 1 course? 2-4 courses? The full curriculum?		Needed resource: arguments for administrators for alignment
Write program level	Collect data (accreditation)	Ask for support in gathering data,	Ideal student exercise

learning outcomes (PLOs)

requirements; interviews or surveys with faculty, students, alumni, and employers about expected program outcomes).

especially institutional or program data.

Example values statement

[Departmental goal-writing activity](#)

[Facilitating faculty meetings](#)

[Facilitating discussions about learning goals](#)

Do the ideal student exercise: Write a recommendation letter for an ideal student graduating from your program.

Do a goal-writing activity with faculty: What should a student be able to do when they graduate? What should they have experienced? Collect ideas and search for themes.

There are many resources for developing objectives, here are a few:

[SEI Learning goal page](#)

Create a values statement for your program (optional). What does it mean for a student to be a member of your discipline? (e.g. “flexibly solve applied problems using critical thinking.”

Share PLOs with faculty and other stakeholders (students, advisors) to get input and engagement.

Non content-based goals
[-Non-curricular student objectives](#)
[-Supporting the whole student](#)
[-Activities beyond the curriculum](#)

Write PLOs, preferably in a facilitated group. What concepts and skills should students have after they

Seek consensus on PLOs with a faculty vote.

complete the program? Consider soft skills and attitudes as well. Use measurable language.

Map current curricula to PLOs

Choose the best format for your curriculum map (e.g., what are the rows and columns?)

Collect artifacts (syllabi and/or learning goals) from target courses

Course Material Auto Coder (CMAC; keyword crawler). Contact: [Emily Fairfax](#) or [David Budd](#).

Draft the map (using data gathered at the right) by filling in which courses fulfill which learning goals, and at what level (e.g., introductory, intermediate, capstone).

Survey or interview faculty who teach target courses and adjacent courses about their goals for these courses.

[Learning opportunities worksheet](#)

[Matrix approach to program design](#)

Seek consensus on map with faculty discussion and vote.

[Interview guide for faculty and students](#)

Finalize the map (for now) using feedback from the department

[Facilitating discussions about learning goals](#)

Develop course learning goals for any courses without them and/or revise

Example maps available by request

PLOs to address gaps and redundancies. Ensure the goals align with the PLOs and the desired curriculum map.

Develop an assessment plan

Develop a plan which identifies how to assess student achievement of these skills at a formative and capstone level. Not all outcomes need to be assessed each year; you may select particular courses whose assessments will measure a particular PLO.

Seek consensus on plan with faculty discussion and vote.

[Develop an assessment plan](#)

[Phys21](#) (report discussing positive assessment practices; UW LaCrosse case study is one example).

Use the map and program assessment data

Implement the assessment plan to gather program level learning assessments.

Analyze strengths, gaps, and redundancies in curriculum.

Seek consensus on plan with faculty discussion and vote. This will likely require a faculty retreat or long-term strategic planning.

Needed resource:
Strategic planning

Make decisions about changes to address program weaknesses, such as retiring courses, developing new courses, and creating extracurricular experiences.

Seek resources to support curricular redesign (instructional design assistance, space, faculty incentives and rewards).

Revise the map to reflect the new curriculum.

Evaluate and act accordingly

Re-evaluate the curriculum and map regularly, based on relevant data.

Create structures to re-evaluate curriculum on a regular basis (such as committees, an annual assessment plan), supported by frequent data collection from students, faculty, alumni, employers, and other stakeholders.

Needed resource:
Example structures

Participant Action Plans and Reflections

[Lisa Dilling \(ENVS\)](#)

- 1. My original goal was:** To learn about what curriculum mapping is, to see how it might apply to ENVS, and see some examples of maps and tools that could be used for curriculum mapping. My implementation goal is actually through the ASSETT program to look at the possibility of coming up for common learning goals for two core classes in our major (that have several sections), cornerstones (3000 level) and capstones (4800 level).
- 2. My current goal is:** To create more coherency in our curriculum, to develop common learning goals that thread through the curriculum, to have buy in from faculty to adopt these learning goals and restructure our classes to teach to the learning goals at different levels. Ultimate the goal is to create a more coherent experience for undergraduates, so that they and we know what is considered a successful learning outcomes for completing the major (what should majors know how to do or know), and for instructors to have a more fulfilling teaching experience since they can count on competencies being built in the classes before them, and can rely on a common starting place for launching their class (right now students can have widely varying preparation entering our classes, since there are so many routes through the major, and instructors end up having to teach basic things just so that everyone can be on the same page for what they want to teach, so it's not efficient and very frustrating for both faculty and students).
- 3. During the past year, my goal has changed in the following ways** (or, I learned these few critical things): I realized that creating buy in takes a lot of time, and I have focused on doing focus groups with faculty rather than individual interviews, and I have focused on a vote of confidence from the faculty to continue to pursue this approach rather than actually having finished harmonized learning goals that they can vote on by spring.
- 4. The biggest challenge(s) I have faced is:** Not enough time. Many competing priorities. Overwhelming task in some ways.
- 5. Here are three things I would like to do in the next year:** Continue conversations and work to define common learning outcomes across the cornerstones and capstones, ultimately have a vote to institute common learning goals for 1000, 10001, 3525 (cornerstones) and 4800 (capstones)
- 6. Here are three resources or collaborations I will need in order to accomplish those tasks.** Would be nice to have students support or some kind of assistance to collate information, make figures and plots, do scheduling, do more research if needed.
- 7. I would like to get following external resources or support (from TRESTLE, ASSETT, this group, or a CTL):** Labor assistance, expert guidance individualized to our situation in ENVS, how to work on our specific challenge.

Teresa Foley and Janet Casagrand (IPHY)

Initial action plan

- **Vision:** My vision is that IPHY create a coherent, well aligned curriculum map of its existing, undergraduate curriculum. Then, if (and when) we decide to make updates to the major in the future, we'll know exactly how the new course(s) fits into the "bigger" picture. Furthermore, a curriculum map will help guide faculty to how his/her course fits into the curriculum, and will encourage faculty to be extra cautious and deliberate when making changes to a course.
- **Sense of urgency:** Our sense of urgency can arise from our ARPAC program review. Since we are under review this AY18-19 year, IPHY has the perfect opportunity to develop program goals for the major and create a map of its undergraduate curriculum. The momentum for this project began after our faculty retreat in May. During the retreat, the #1 topic of discussion was the undergraduate curriculum and how it needs to be revisited and updated. And with the new chair on board with these potential changes, we MUST strike now while the iron is hot!
- **Guiding coalition:** Our guiding coalition includes myself and Janet Casagrand, both Senior Instructors in the department. Janet and I were a part of the Science Education Initiative in IPHY (2006-2011) and we currently serve as 2 of the 3 IPHY Departmental Education Specialists in charge of monitoring/revising the undergraduate curriculum. We have extensive experience in pedagogy, faculty working groups, and science education research. To support our transformation efforts, we have the backing of the Chair (Mark Opp), the Associate Chair of Undergraduate Education (Ruth Heisler), the Associate Chair of Faculty Affairs (Roger Enoka), and the Curriculum Committee. We will also bring this map up for discussion during our monthly faculty meetings.

Plans for Fall 2018

Task	Detail	Is this a small win?	Is this highly critical?
Task 1	Apply for Chancellor's Award to work on an IPHY curriculum map (due 10/1)	x	
Task 2	Develop curricular goals and get faculty approval		x
Task 3	Begin development of curricular map template	x	

Plans for Spring 2019

Task	Detail	Is this a small win?	Is this highly critical?
Task 1	Collect syllabi, course goals, exams, and exam data (non-identified)	x	

Task 2	Faculty interviews of course content and artifacts		x
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Plans for Summer 2019

Task	Detail	Is this a small win?	Is this highly critical?
Task 1	Analysis of course artifacts & assessments		x
Task 2	Start mapping lower and upper division courses, look for progression of difficulty		x
Task 3	Look at vertical and horizontal alignment of curriculum, and identify and redundancies and/or gaps in student skills and knowledge		x

Plans for AY 2019-2020

Task	Detail	Is this a small win?	Is this highly critical?
Task 1	Discussion of curriculum map and (re)alignment with IPHY faculty		x
Task 2	Dissemination of map to advisors and students		x
Task 3	Identify sustainability methods		x

IPHY program level learning outcomes

1. Scientific method and critical thinking

- **Employ the scientific method** - ask research questions related to anatomy and physiology; search existing literature for relevant studies; create and test hypotheses; design experiments with appropriate controls; acquire, analyze, interpret, and present data; draw evidence-based conclusions; identify strengths and limitations of the design; and place experimental results in the larger scientific context.
- **Critical thinking**
 - Apply knowledge of the human body to new and real-world contexts.
 - Analyze anatomical and physiological data (e.g., graphs, images, tables, etc.) to extract meaning and significance.
 - Judge and critique claims regarding the human body in the scientific literature and popular media.
 - Synthesize ideas and concepts from multiple sources to form new, integrated and meaningful patterns/designs/inventions in anatomy and physiology.

2. Professional skills

- **Communication** - Possess effective verbal and written communication skills, and the ability to successfully communicate an understanding of the human body to a wide audience.
- **Collaboration/teamwork** - Collaborate with others towards shared goals.
- **Scientific reading comprehension** - Demonstrate the ability to search, critically evaluate, and analyze scientific literature in the fields of anatomy and physiology.
- **Disciplinary experience and awareness** - Gain experience in disciplinary settings (e.g., research, teaching, leadership, outreach, internship, volunteering), and awareness of a variety of careers suitable for those with expertise in integrative physiology.
- **Basic skills** – Demonstrate practical and relevant lab and technology skills.

3. Metacognition (thinking about one's thinking)

- **Self-reflective learning**
 - Work to develop periodic self-assessment of one's knowledge, skills, and interests.
 - Be open to (and act on) feedback as part of the learning process.
 - Seek out the assistance of expert individuals.
- **Study and test-taking skills** - Develop proficiency in effective studying and test-taking skills.
- **Time management** - Develop time management skills, including the ability to plan ahead, prioritize tasks, and adapt to change.

4. Disciplinary knowledge

- **Terminology** - Develop a vocabulary of appropriate terminology to effectively communicate information related to anatomy and physiology.
- **Levels of organization** - Develop a broad working knowledge of the different levels of organization (molecules, cells, tissues, organs, and organ systems) in human health and disease.
- **Homeostasis**
 - Recognize and explain the principles of homeostasis and the use of feedback loops to control physiological systems in the human body.
 - Explain how organisms sense and control their internal environment and how they respond to external change.
- **Structure/function relationship**
 - Recognize the anatomical structures and explain the physiological functions of body systems.
 - Use anatomical knowledge to predict physiological consequences, and use knowledge of function to predict the features of anatomical structures.
- **Ways of thinking about physiology** – Demonstrate an understanding of the human body at the teleological (why) and mechanistic (how) levels.

Final reflection

1. Our original goal was:

- Fall 2018
 - Apply for Chancellor's Award
 - Develop program level learning goals
 - Decide on curricular map template
- Spring 2019
 - Collect course artifacts
 - Start faculty interviews of course content
- Summer 2019
 - Analyze course artifacts and assessments
 - Start mapping lower and upper division courses
 - Look at vertical and horizontal alignment of curriculum

2. **Our current goal is:** So far, we are mostly on track with our timeline. We are still waiting for final approval of the IPHY program goals by the faculty, and we hope to begin mapping this summer.
3. **During the past year, our goal has changed in the following ways** (or, I learned these few critical things): It took longer than anticipated to get the IPHY program goals approved. Our presentation to faculty kept getting pushed off for other departmental matters.
4. **The biggest challenge(s) we have faced is:** Gaining momentum on the project. It will be much easier to focus on the map in the summer when we have less commitments.
5. **Here are three things we would like to do in the next year:**
 - Finish a draft of the IPHY curriculum map
 - Present the completed map to faculty
 - Document the process for future reference
6. **Here are three resources or collaborations we will need in order to accomplish those tasks.**
 - TIME
 - TIME
 - TIME
7. **We would like to get following external resources or support** (from TRESTLE, ASSETT, this group, or a CTL):
 - Summer salary to continue working on project in the future
 - Expertise on how to update/sustain a curriculum map

Sarah Wilson Sokhey Draft Action Plan

Initial action plan

- Vision: My vision is a departmental curriculum in which we have identified some common goals for students on which most (but likely not all) faculty agree and that we have an idea of what students should know and/or be able to do when they graduate.
- Sense of urgency: Our sense of urgency can arise from the fact that we have an external review of our department coming up in the near future. We will be asked to reflect on our curriculum and goals. This is also a good time to capitalize on the fact that we have a lot of majors and there is currently a lot of interest in political science. This may not always be the case, but we can use this moment to strengthen the appeal of a political science major long-term.
- Guiding coalition: There is not currently a “guiding coalition”. We have department committees on undergraduate curriculum and a graduate studies committee. Those would be good places to start. There is disagreement on how much our department should be emphasizing quantitative empirical analysis in our training. I would hope to identify some goals for our students that are bigger than this and on which most of use could agree.

Plans for Fall 2018

Task	Detail	Is this a small win?	Is this highly critical?
Task 1	Develop a proposal	Yes	Yes
Task 2	Present proposal to a department committee	Yes	Yes
Task 3	Revise proposal	Yes	Yes

Plans for Spring 2019

Task	Detail	Is this a small win?	Is this highly critical?
Task 1	Present proposal to the department	Bigger win!	Yes
Task 2	Revise proposal again	Yes	Yes
Task 3	Adopt/implement proposal	Biggest win!	Depends

Final reflection

1. **My original goal was:**To learn more about curriculum mapping and its benefits in political science and the social science more broadly. Rather than being interested in a department-wide overhaul, I was interested in thinking about more incremental ways in which curriculum mapping might be useful for groups of faculty seeking to promote some common goals in the curriculum.
2. **My current goal is:** My current goal is to pursue some content analysis (curricular assessment) of my own courses in PSCI and possibly some other courses in the department to see if we are actually teaching in a way that promotes the goals we want to. Long run, this might be a basis for encouraging the department to pursue this kind of content analysis more broadly and, perhaps, to engage in department-wide curriculum mapping.
3. **During the past year, my goal has changed in the following ways (or, I learned these few critical things):** My goals have remained the same.
4. **The biggest challenge(s) I have faced is:** The biggest challenge will be collecting course materials for the initial content analysis. Identifying common teaching goals is another big challenge if I were to pursue this on a department-wide scale.
5. **Here are three things I would like to do in the next year:**
 - Content analysis of my course materials
 - Content analysis of other course materials in a PSCI class
 - Possibly have a discussion about curriculum in the department.
6. **Here are three resources or collaborations I will need in order to accomplish those tasks.** One resource is already available. I have had discussions with Andrew Martin in EBIO about the software used to map goals using course materials. Another important collaboration would include my colleagues in the department and a departmental committee.
7. **I would like to get following external resources or support (from TRESTLE, ASSETT, this group, or a CTL):** Right now, I'm not actively seeking external resources or support. I was part of an application for internal money at CU which would have supported curricular assessment across several fields, but that application was not successful. At the moment, I'm more interested in an incremental approach to curricular assessment and mapping rather than a departmental overhaul. As such, I don't see an immediate need for external resources.

Program level learning outcomes: <https://www.colorado.edu/ebio/undergraduate/learning-goals-0>

Final action plan:

1. My original goal was:

- Learn from others about their vision of curriculum mapping and its utility
- Discover whether different disciplines have unique or overlapping goals so that mapping can be of larger scope than a single department

2. My current goal is:

- Develop a process of constructing and revising a map that can be continuously used by the department as we change over time
- Find resources to hire people to help develop mapping as an integral part of curriculum development and implementation

3. During the past year, my goal has changed in the following ways

- Realized how little has happened on campus and the general lack of interest by most chairs/associate chairs because they are focused on running things with too few resources, so doing the essential parts of mapping depends on the “good will” of individuals in the absence of any institutional and financial support
- I would really like to bring folks together with similar interests and either 1) write a grant to engage in curriculum mapping or 2) propose a model to the administration and gain resources (\$\$) to pay people to do the work

4. The biggest challenge(s) I have faced is:

- Getting faculty to archive their courses in a way that the curriculum and assessments are easily accessed
- Getting resources to support people to go through the resources using a rubric and code courses across the major
- Finding time to present the progress and results to faculty

5. Here are three things I would like to do in the next year:

- Write a grant, develop the CMAC using good libraries of search terms, assemble archives of all course materials and assessments, work on outcomes assessment for regular implementation each year

6. Here are three resources or collaborations I will need in order to accomplish those tasks.

- Money to hire a graduate student who takes on this task as part of a scholarship of teaching and learning project with the ultimate goal of education training
- Develop consortia of faculty around key learning outcomes to engage in the scholarship of teaching and learning and ultimately make the results public

7. I would like to get following external resources or support (from TRESTLE, ASSETT, this group, or a CTL):

- Yes please
- Financial support: CTL-supported GRAs, CTL-supported “making work public” assistance

Position paper for CTL

The following is a position paper shared with the interim director for the new Center for Teaching and Learning regarding needs on campus around curricular reform and mapping.

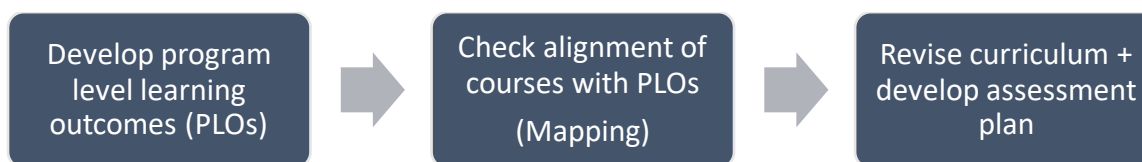
About this position paper:

The discussion in this short paper is based on the experience of 5 faculty and instructors in 4 departments at the University of Colorado who participated in a 2-semester Special Interest Group on *Aligning Courses and Goals for the Major*, co-facilitated by Stephanie Chasteen (Center for STEM Learning, TRESTLE) and Amanda McAndrew (ASSETT).

Statement of need for support of curricular alignment:

During the past decade, CU Boulder has concentrated many efforts and resources on supporting faculty to reform their undergraduate courses using learning goals and evidence-based teaching practices. One major initiative was the Science Education Initiative, a \$5M five-year program to provide resources to departments in the form of postdoctoral fellows who collaborated with faculty to identify the key goals for their courses and alignment of instructions and assessments with those goals (i.e., “backwards design”). The lessons-learned from this initiative are outlined in the *Science Education Initiative Handbook* ([free and online](#)) and in *Improving How Universities Teach Science* (Wieman, 2017).

As the culture at the university has slowly transformed to embrace teaching practices based on backwards design frameworks, Chasteen has seen a growing need and interest in using backwards design at the program level. More programs are undertaking *curricular alignment* projects, where program level learning goals are developed and the existing curriculum is mapped to those goals. This curricular mapping process then drives the development of a program-level assessment plan, and of changes to the curriculum itself; see figure below.



Curricular alignment is a valuable activity for departments and programs because it:

1. Creates a more cohesive major.
2. Allows for a more intentionally designed major, rather than “business as usual.”
3. Allows elimination of redundancies in the curriculum, resulting in efficiencies.
4. Allows identification of gaps in the curriculum, creating a clearer argument for any new courses.
5. Leverages required assessment processes (e.g., ARPAC) to be more valuable to the program.
6. Ultimately, better prepares students for their future careers.

In our TRESTLE/ASSETT Special Interest Group, the participants and their departments were in varying stages of development of curricular alignment, from initial exploration, to identifying program level learning goals, to garnering departmental support for the process. Their individual experiences can be read on our [TRESTLE Scholars public webpage](#). Across these diverse individuals, we identify the following needs around curricular alignment which we feel ought to be supported by the university:

The university needs to *inform* faculty and departments about curricular alignment.

Participants in this group took time to orient to the difference between *course level learning goals*, and *program-level learning outcomes*. The university will need to develop position statements on the difference between these, and to what degree programs and courses are expected to develop these items. Then, professional development to develop goals and map the curriculum to them is needed.

The university needs to *incentivize* faculty and programs to engage in curricular alignment.

A curricular alignment project takes a lot of time. Most participants found it took more time than expected, they only began the process. Many programs are not yet ready to prioritize this work, and are not sure whether it is a priority at the university level. For a faculty member motivated to improve the program for students, this effort is out of the scope of the expectations of service; summer salary or course release is appropriate. It is also an effort which requires engagement from the full department, and thus needs a stamp of approval and concrete support from administrators. One participant specifically used the ARPAC review process as a way to push the department to work on curricular alignment. Another participant reflected:

My experience in trying to experiment with new teaching tools, make revisions, or even evaluate teaching differently is that it is driven by the individual effort of the faculty member, is very difficult and needs a lot of trial and error, and is not rewarded by the structure of the tenure system. So, in a world of finite time, revising classes and curricula is glacially slow because people are trying to do things on their own. When they don't work the first time, it can be very discouraging because we only have so much time, and it's unclear how much curriculum revision is valued at the university and in promotion processes.

The university needs to provide *human resources*.

Developing program level learning goals and mapping them to courses takes a lot of time on the part of busy faculty. One faculty member had a graduate research assistant supporting the departmental work at just 5 hours per week, and found that this support made the difference in actually completing the work. This student gathered syllabi and learning goals, organized focus groups, and initiated the work of mapping. Another human resource which can be very valuable is that of experts; neutral expert facilitators and program developers who can help a program develop goals and map the curriculum. And when courses need to be redesigned or newly developed, instructional designers (such as those in ASSETT) to work with faculty members to develop goals and instructional techniques are very valuable.

The university needs to provide *intellectual resources*.

Departments currently start from scratch in developing their approach to curricular alignment, and a matrix to map courses to goals. Starting from examples or blank templates is much more efficient.

Resources requested include:

1. Blank curriculum mapping matrices
2. Example program level learning outcomes at the university
3. Examples of multiple measures at the program level
4. A university web page dedicated to curricular alignment which defines terms, identifies the process of undertaking a mapping, provides blank templates for the process, offers the help of professionals, and documents lessons learned from other programs.

We believe that curricular alignment is a process that has great potential value for CU Boulder, and encourage the institution to better support programs in undertaking this task.