

Course Transformation Outcomes and Timeline

Source: Carl Wieman Science Education Initiative

PDF and editable Word version: <https://pressbooks.bccampus.ca/seihandbook/chapter/supplemental-documents/>

This document provides an overview and checklist of the process and timeline of transforming a course. This is intended to serve as guidance to departments, faculty members, and DBESs, to support clear and shared expectations, and a manageable approach to the work.

SEI goal and philosophy

By supporting and facilitating faculty, the SEI effort seeks to:

- Better align student learning with the faculty-defined, key learning goals/outcomes (e.g. what faculty want students to be able to do at the end of the course)
- Maximize student learning and engagement in learning by having faculty use research and measurements of learning to guide their instructional approaches
- Sustain a research-based approach to teaching in these courses through 1) the broad representation of faculty in the process and 2) the development of resources that make it both easier and more rewarding for faculty to use a research-based approach to teaching

Suggested indicators for full implementation

The list below offers guidance to departments, faculty, and science education specialists (SEs) on the activities and accomplishments that maximize the chances that the SEI efforts on a particular course meet the above goals. The length of time required to implement all of the suggestions below will vary with the course, but it is expected that it will require at least two iterations of teaching the course to complete them satisfactorily (see next page for approximate timeline).

1. Overarching theme

- Learning goals, assessments, and curricular resources reflect faculty priorities and are developed with faculty input

2. Course-scale learning goals

- Highlighting key concepts and big ideas that faculty want students to learn and at what level
- Indicating what students would be able to do if they understood concepts/ideas at the desired level
- Faculty consensus on 70-75% of goals
- If developed, examples of various learning goals for the remaining 30%

3. Lecture-scale and topic-scale learning goals

- At minimum, develop some examples consistent with course- and topic-scale goals

4. Assessment tools that provide data to guide faculty in their efforts on the course

- General characteristics:
 - Aligned with learning goals
 - Validated through student interviews and faculty reviews
 - Valued by faculty—reflects their priorities and their input
 - Easy-to-use
- Types of assessment tools:
 - Content learning and conceptual understanding
 - Beliefs about discipline/interest in discipline (e.g. Colorado Learning Attitudes About Science Survey; CLASS) (optional)
 - Skills learning assessment (e.g. Lawson scientific reasoning test) (optional)

- Student feedback on aspects of course that are useful (e.g. Self-Assessment of Learning Gains; SALG) (optional)
5. **Create resources for faculty that are aligned with learning goals.** Many will be based on research (e.g. student interviews, existing literature, or assessment results). Include documentation of research-justification associated with the approach/questions/activities to the extent it is available. Examples:
- Lecture notes
 - Concept/clicker (in-class voting) questions
 - Homework/tutorials/in-class activities
 - Exam questions
 - Summary of common student difficulties by learning goal/topic (required)
6. **Plan for sustainability**
- Archived information, easily transferable/adaptable by new faculty
 - If appropriate, structure and funding in place to support course components that have been added (homework sessions, additional TAs or undergraduate assistants, added recitation/tutorial, data analysis, etc.)
 - Ensure most of the relevant faculty have the knowledge and background to implement the materials
 - Plan for how faculty instructors teaching the course in the future will be introduced to departmental goals, materials, and expectations for the course.

Timeline for course transformation

	By end of planning term	By end of first teaching term	By end of second teaching term
Short summary of course structure and rationale	Outlined	Revised	In final documentation
Course transformation project scope	Outlined	Revised	In final documentation
Course-level learning goals ¹	Draft: involve stakeholders	Revised	Broadly accepted ² , in documentation
Module- or lecture-level learning goals	Draft	Revised	Mapped to course learning goals ³
Assessment ⁴ , feedback, and grading scheme	Draft plan	Revised plan and materials	Optimized plan and materials
Teaching methods (pedagogy) ⁵	Draft plan	Revised plan and materials	Optimized
Short summary of structure and rationale ⁶		Draft	In final documentation
Materials archived			Completed
Plan for sustainability ⁷			Completed
Share progress/problems	Annual or semiannual mini-retreat		

¹ Many resources exist to assist in articulating learning goals. Here is a place to start, in addition to talking to an SES:

http://www.cwsei.ubc.ca/resources/learn_goals.htm.

² "Broadly accepted" means including all closely-relevant stakeholders in the course (recent instructors, department committee), not necessarily official curriculum channels.

³ It's recommended that about 70-75% of module- and lecture-level learning goals are broadly accepted by relevant stakeholders (recent instructors, department committee). 25-30% will/may vary depending on instructor emphasis. All module- and lecture-level learning goals should explicitly support one or more course-level goals.

⁴ Assessment broadly includes any metric designed to provide evidence of the course's effectiveness. Assessments measure what students think or are able to do, including what the course helps them achieve. Examples include: (1) Diagnostics administered at the start of term to determine student preparation, (2) tests of concepts administered both at the beginning and end of the term to measure student gains; (3) attitudinal surveys administered both at the beginning and end of the term, (4) many types of assessments (e.g. quizzes, homework) administered throughout the term.

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- ⁵ Pedagogy broadly includes all the types of opportunities students will have to engage with course material. What will happen during class time? What are students expected to do outside of class? How do all the pieces fit together to support the course's goals?
- ⁶ Includes strategies for implementation and how course-level learning goals fit program.
- ⁷ What needs to be put in place so that the course can and will be effectively passed on to a new instructor?