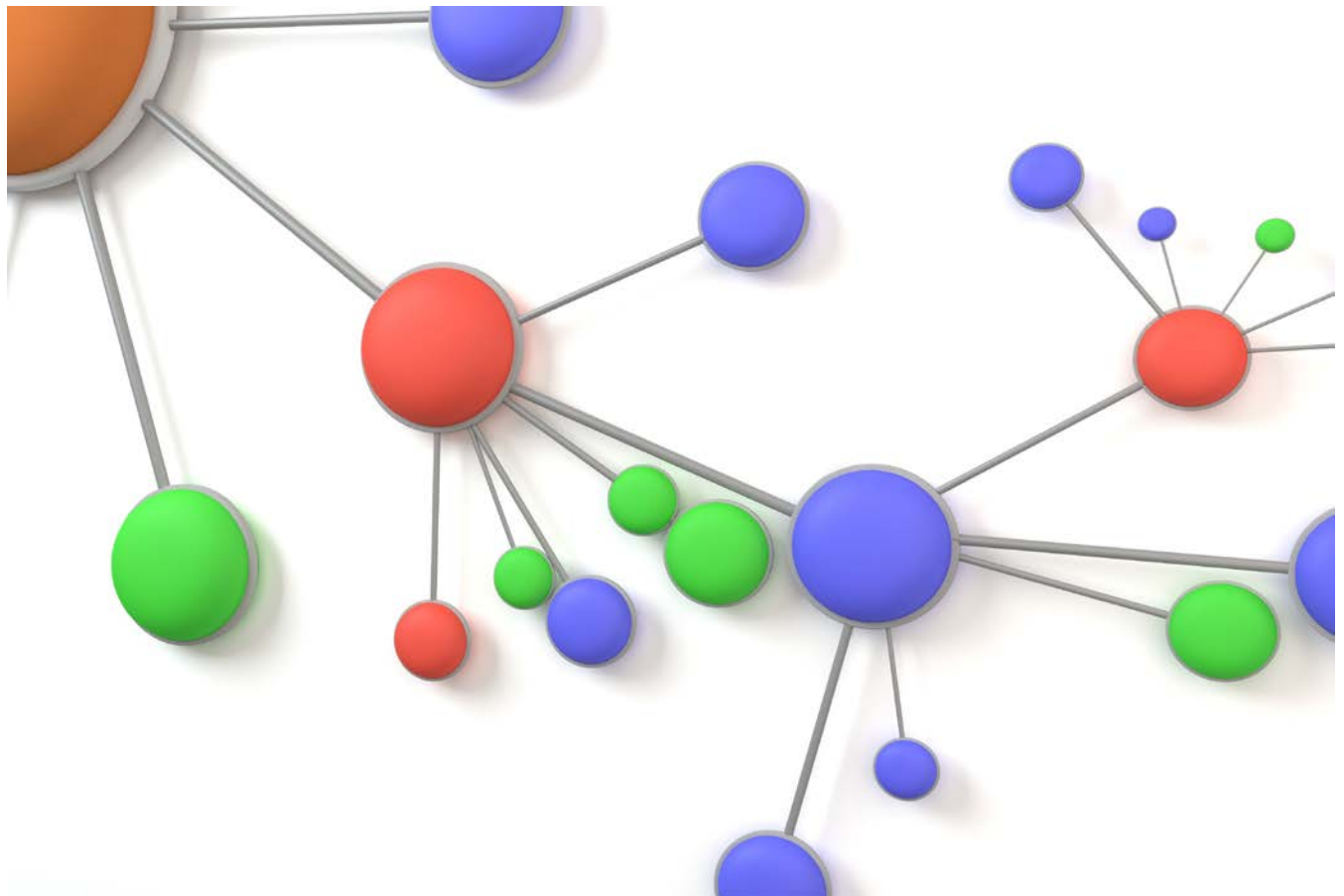


# Curriculum Review: Curriculum Mapping



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November 2017



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November 2017  
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**Recommended Citation**

Dyjur, P. & Kalu, F. (2017). *Curriculum review: Curriculum mapping*. Calgary: University of Calgary.

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# Curriculum Mapping

## What is curriculum mapping?

Curriculum mapping is the process of associating course outcomes with program-level learning outcomes (PLOs) and aligning elements of courses with a program, to ensure that it is structured in a strategic, thoughtful way that enhances student learning (adapted from Harden, 2001).

## University of Calgary Definition and Description of Curriculum Mapping

- The process in which the learning outcomes, teaching and learning strategies, and assessment processes for each course in a program can be represented to create a summary of the learning plan for an entire program of study so that the relationships between the components of the program can be observed (University of Calgary, p. 3, 2013).
- Each faculty member will enter the learning outcomes for each course he/she teaches, the primary teaching and learning strategies employed, and the assessment methods used. It is expected that all courses will be mapped (University of Calgary, p. 8, 2013).

## Features of Curriculum Mapping

- The process of making associations or connections
- Must align with the needs of the program or faculty
- Easily accessible and portray a clear picture of what information should be recorded in the map
- Can be done in various ways
- Program-level learning outcomes must be written before a department/ faculty can do curriculum mapping
- Course outcomes must be written before an individual can map his/ her course
- Other things can be mapped as well

## **Benefits of Curriculum Mapping**

- Provides a view of the curriculum as a whole
- Relationships within the curriculum can be easily identified
- Encourages communication amongst faculty members within a program
- Provides an opportunity for reflection
- Provides a context for planning and discussing the curriculum
- Easy identification of strengths, gaps and redundancies in a curriculum
- Supports the process of curriculum review and evaluation

## Curriculum Map Aligning Course Outcomes to Program-level Learning Outcomes (PLOs)

This example shows the alignment of a course outcome from a course to program-level learning outcomes (PLOs). The PLOs are listed across the top in abbreviated form. The instructor lists his or her course outcomes down the left-hand side. The instructor examined the course outcome, and decided which of the PLOs it was associated with to a MODERATE to STRONG degree, not a weak or peripheral one. Where there is alignment, the instructor has decided if the course outcome addresses the PLO at an introductory level, if the students are developing a higher level of competence, or if they are expected to show a more advanced level of expertise and sophistication in their learning.

The instructor will continue to add all course outcomes to the chart and note the alignment to PLOs.

	Disciplinary Knowledge	Critical Thinking	Communication	Research Skills	Ethical Reasoning
Write an essay, analyzing complex issues using multiple forms of evidence to support their argument.		D	D	I	

**I = Introduced:** Key ideas, concepts or skills related to the learning outcome are introduced and demonstrated at an introductory level. Instruction and learning activities focus on foundational knowledge, skills and/or competencies and entry-level complexity.

**D = Developing:** The learning outcome is reinforced with feedback; students demonstrate the outcome at an increasing level of proficiency. Instruction and learning activities concentrate on enhancing and strengthening existing knowledge and skills, as well as expanding complexity

**A = Advanced:** Students demonstrate the learning outcome with a high level of independence, expertise and sophistication expected upon graduation. Instructional and learning activities focus on and integrate the use of content or skills in multiple levels of complexity. Adapted from California State University, Long Beach (n.d.) and Veltri, Webb, Matveev & Zapatero (2011).

# Aligning Learning Outcomes, TLAs, and Student Assessments

The following chart is similar, but has two extra columns for teaching and learning activities (TLAs) and student assessments. The instructor has added information on the TLAs being used in the course to support student learning of the course outcome, and how it is being assessed.

## Constructive Alignment

Constructive alignment is a term used to describe the fidelity between course outcomes, student assessment, and teaching and learning activities (Biggs, 2014). Ideally an instructor will first define the course outcomes, and then align the student assessment and TLAs with the outcomes. A lack of alignment can be problematic in a course.

For example, for the course outcome listed below, the instructor has organized lectures, readings, and online resources so that students can write an essay analyzing complex issues. The assessment is for students to write a research paper. While the teaching and learning activities should be helpful, the instructor can improve the constructive alignment by building in some hands-on activities such as in-class writing, peer feedback, and example critique.

	Teaching & Learning Activities	Disciplinary Knowledge	Critical Thinking	Communication	Research Skills	Ethical Reasoning	Student Assessments
Write an essay, analyzing complex issues using multiple forms of evidence to support their argument.	Lecture, readings, online resources		D	D	I		Research paper

# FAQs

## Can I pick the mapping method?

- Maybe. Typically the Review Lead picks the method that will be used to map the program
- Sometimes the Unit Lead, Associate Dean or Dean will define what mapping method will be used so that there is consistency across the faculty
- Individuals do not select what method they would like to use to map their course. Everyone mapping a course within the same program will use the same tool and the same process.

## What gets mapped?

- All required courses in a program: This is the bare minimum
- Courses that fulfill a requirement, if possible
- Courses within the discipline, if possible
- Optional courses: if feasible
- Courses from other disciplines: Consider on a case-by-case basis
- Relevant educational experiences in graduate programs for instance professional development activities
- Thesis or dissertations when appropriate

## Who does the mapping?

- The instructor of the course
  - If you have several choices, who did it most recently? Most frequently?
- If there isn't an instructor to do the mapping:
  - RA, program coordinator or review lead can map working from the syllabus

## What about courses with multiple sections?

- If only one section needs to be mapped, who does the mapping?
  - Is there a lead instructor or course coordinator?
  - Is there a section that is typical of most sections of the course?
- If you want to compare multiple sections of a course:
  - Have most/all instructors map their section
  - Enables you to check for consistency of student learning experiences



## **How long will it take?**

- The first map typically takes about half an hour
- After that, instructors might take 15-20 minutes to map each course

## **How to determine if a course outcome aligns to a PLO?**

- Look for MODERATE to STRONG alignment
- If a course outcome is weakly or peripherally associated with a PLO, do not indicate an alignment
- Charts that include weak or peripheral association make it harder to interpret where the focus of the program is

## **What is the end result?**

- Depends on which method you use
- Each instructor reflects on the alignment of their own course with PLOs
- Mapping data can be aggregated to show strengths, weaknesses, alignment and trends across the program

# Online Survey Tools

## Link to Example Survey

Sample survey can be found at: <https://www.surveymonkey.com/r/9FKXGDF>

Benefits	Drawbacks
Flexibility with the number and types of questions and response formats	Aligning course outcomes to program-level learning outcomes is a bit cumbersome
Better reporting than some of the other methods	Advanced reports will require time and effort to generate (just like other methods)
Many participants will be familiar with the tool; support issues are likely to be fewer than other methods	There may be a cost if your department/faculty does not have access to an online survey tool

## Questions from the Online Survey Tool

Please note that the following includes different ways of structuring the questions on teaching and learning activities and student assessments. When you design your survey, you will pick ONE of the formats (eg. categories, open text box, checklist, dropdown arrows) and follow that pattern.

### Page 1 description:

Thank you for filling out this survey. In it you will be asked questions about a course that you teach that is currently part of the curriculum review process. Please fill out a separate survey for EACH course that you are mapping, as identified by the Review Lead. You may want to work from your most recent course outline. It will take approximately 15 - 30 minutes to complete each survey.

Information from all courses under review will be compiled to produce a report on the program.

These data, along with student survey data, will inform discussions around what is working well in the program and changes that should be considered.

Thank you for your participation!

1. Your name: (text box)
2. Email address: (text box)
3. Course code and number (eg. UNIV 201) (text box)
4. Course level: (radio buttons)

- 200
  - 300
  - 400
  - 500
  - 600
5. When was the last time you taught this course?
6. Course requirement status (check all that apply):
- Required for BA
  - Required for BSc
  - Required for Honours
  - Can fulfill a requirement
  - Optional course
7. Does this course have labs?
- Yes
  - No
8. Is this a seminar course?
- Yes
  - No

**Page 2 description:**

On this page, enter your course outcomes. For each course outcome, indicate which program-level learning outcomes (PLOs) it is associated with to a MODERATE or STRONG degree. Please do not indicate an alignment if the course outcome is associated weakly or peripherally to the PLO.

To indicate the expectations of the level of student learning we will be using the scale Introduced, Developing, Advanced. A description of the scale is as follows:

**Introduced:** Key ideas, concepts or skills related to the learning outcome are introduced and demonstrated at an introductory level. Instruction and learning activities focus on basic knowledge, skills and/or competencies and entry-level complexity.

**Developing:** The course outcome is reinforced with feedback; students demonstrate the outcome at an increasing level of proficiency. Instruction and learning activities concentrate on enhancing and strengthening existing knowledge and skills, as well as expanding complexity.

**Advanced:** Students demonstrate the learning outcome with an increasing level of independence, expertise and sophistication expected upon graduation. Instructional and learning activities focus on and integrate the use of content or skills in multiple levels of complexity.

N/A = Not addressed in this course. Please note that your course outcomes probably won't align to all PLOs. This is normal and expected.

Complete program-level learning outcomes (PLOs) are listed below:

By the end of the program, students will be expected to:

- Develop a knowledge base of theories and concepts within their primary area of study.
- Use different approaches to solving problems using well established ideas and techniques within the discipline.
- Locate and critically evaluate qualitative and quantitative information.
- Formulate and communicate orally and in writing arguments based on information, theories, and concepts.
- Apply knowledge and skills in a variety of contexts, including situations that are new to the student.
- Conceptualize, design, and implement research for the generation of new knowledge or understanding within the discipline (Council of Ministers of Education, 2007).

For assistance please contact your Review Lead or support person (names and contact info here).

9. Please enter your first course outcome: (text box)

10. Map the course outcome listed above to one or more program-level learning outcomes:

**10. Map the course outcome listed above to one or more program-level learning outcomes:**

(course outcome)	Knowledge of theories and concepts	Problem solving	Evaluate qualitative and quantitative information	Communication	Apply knowledge	Research
	Introduced ▾	Developing ▾	Advanced ▾	N/A ▾	▾	▾

**11. Indicate the teaching and learning activities associated with this course outcome (check all that apply)**

Direct instruction: eg. lecture, presentation, demonstration

11. Indicate the teaching and learning activities associated with this course outcome (check all that apply):

- Direct instruction: eg. lecture, presentation, demonstration
- Interactive instruction: eg. brainstorming, discussions, lab and study groups
- Indirect instruction: eg. case studies, inquiry, problem solving
- Independent study: eg. essays, homework, problem solving
- Experiential learning: eg. practicum and internships, projects, observations

12. Indicate the ways in which you assess student learning of the course outcome (check all that apply):

- Final exam

- Quiz or midterm
- Paper, essay or written assignment
- Problem set
- Project
- Portfolio
- Reflection
- Presentation or oral assignment
- Skill demonstration
- Performance
- Authentic assessment
- Other (please specify) (text box)

13. Please enter your second course outcome:

14. Map the course outcome listed above to one or more program-level learning outcomes

	Knowledge of theories and concepts	Problem solving	Evaluate qualitative and quantitative information	Communication	Apply knowledge	Research
(course outcome)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
15. Indicate the teaching and learning activities associated with this course outcome (check all that apply):	<input type="checkbox"/> Introduced <input type="checkbox"/> Developing <input type="checkbox"/> Advanced <input type="checkbox"/> N/A					

15. Indicate the teaching and learning activities associated with this course outcome (check all that apply):

- Lecture or presentation
- Readings
- Discussion
- Lab
- Problem solving
- Tutorial groups
- Group work/ group project
- Online discussions
- Online tutorials
- Writing activities
- Homework
- Research projects
- Field trip

- Conducting an experiment
- Simulations
- Observations
- Research
- Internship or practicum
- Peer evaluation
- Other (please specify) (text box)

16. Indicate the ways in which you assess student learning of this course outcome: (text box)

17. Please enter your third course outcome:

18. Map the course outcome listed above to one or more program-level learning outcomes:

(course outcome)	Knowledge of theories and concepts	Problem solving	Evaluate qualitative and quantitative information	Communication	Apply knowledge	Research
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

15. Indicate the teaching activities associated with this course outcome (check all that apply):

...  ...

- Introduced
- Developing
- Advanced
- N/A

19. Indicate the teaching and learning activities associated with this course outcome: (text box)

20. Indicate the ways in which you assess student learning of this course outcome: (text box)

21. Please enter your fourth course outcome:

22. Map the course outcome listed above to one or more program-level learning outcomes:

23. Indicate your primary instructional method: (dropdown menu)

**23. Indicate your primary instructional method:**

- Direct instruction: eg. lecture, presentation, demonstration
- Interactive instruction: eg. brainstorming, discussions, lab and study groups
- Indirect instruction: eg. case studies, inquiry, problem solving
- Independent study: eg. essays, homework, problem solving
- Experiential: eg. practicum and internships, projects, observations
- I do not teach the learning outcome in this course

24. Indicate your secondary instructional method: (dropdown menu)

25. Indicate your primary assessment method: (dropdown menu)

26. Indicate your secondary assessment method: (dropdown menu)

(Continue adding the three questions for approximately 10 course outcomes.)

### Page 3: Additional Questions

(Add additional questions related to the guiding questions for the review)

27. In general, do students have the prerequisite knowledge and skills to be successful in this course? Please comment. (text box)
28. What learning technologies are used in this course? (text box)
29. Which of the following high-impact educational practices (Kuh, 2008) are emphasized in this course?
  - First-year seminars and experiences, common intellectual experiences, learning communities, writing-intensive courses, collaborative assignments and projects, undergraduate research, diversity/ global learning, service learning, community based learning, internships, capstone courses and projects

# Paper-based Approach

More templates can be found at: <https://curriculummapping.weebly.com/mapping-templates.html>

<b>Benefits</b>	<b>Drawbacks</b>
Chart format makes it easier to see the constructive alignment (or lack of it) in a course	No report is automatically generated
Can be done electronically or in a face-to-face setting	Someone has to manually aggregate the data; the higher the number of courses that are mapped, the higher the workload
Complete flexibility to structure the mapping process to suit your department or faculty	



# Paper Based Approach Example

## Course Outcomes to Program-level Learning Outcomes: Adapted from an Undergraduate Program

Program-level Learning Outcomes (PLOs)										
Your Name:	Teaching and Learning Activities	1. Disciplinary Knowledge	2. Ethical Knowledge	3. Communication: To develop clear and effective written skills	4. Communication: To develop clear and effective oral skills	5. Critical Thinking: Ability to analyze and critically	6. Argument Construction : Ability to marshal evidence	7. Research Skills: Ability to formulate questions,	8. Citizenship Understanding : Develop an understanding of	Student Assessments
Course Number:										
Course Outcomes										

**Scale:**

**I - Introduced:** Key ideas, concepts or skills related to the learning outcome are introduced and demonstrated at an introductory level. Instructional and learning activities focus on basic knowledge, skills and/or competencies and entry-level complexity.

**D - Developing:** Learning outcome is reinforced with feedback; students demonstrate the outcome at an increasing level of proficiency. Instructional and learning activities concentrate on enhancing and strengthening existing knowledge and skills, as well as expanding complexity.

**A - Advanced:** Students demonstrate the learning outcome with a high level of independence, expertise and sophistication expected upon graduation. Instructional and learning activities focus on and integrate the use of content or skills in multiple levels of complexity.

Adapted from California State University, Long Beach. (n.d.) and Veltri, N. F., Webb, H. W., Matveev, A. G., & Zapatero, E. G. (2011)

**Examples of Teaching and Learning Activities:** Lecture, demonstrations, reading, discussion, debates, problem solving, case studies, group projects, inquiry, essays, journals, research projects, field trips, practicum,, simulations

**Examples of Student Assessments:** Exam with closed questions (multiple choice, true/false), Exam with open-ended questions (short answer, essay), report, research paper, portfolio, journal, reflection, written assignment, presentation, oral project, project, skill demonstration

## Excel Template

Benefits	Drawbacks
Complete flexibility to structure the mapping process to suit your department or faculty	No report is automatically generated
Can be done electronically or in a face-to-face setting	Someone has to work in Excel to aggregate the data
You can produce some amazing charts and graphs if you have the skills to work in Excel	Support needs for instructors could be higher than the other approaches
The EDU can provide a template as a starting point for you to revise	The EDU cannot provide support with Excel

### Excel Template Example

	A	B	C	D	E	F	G	H	I	J
1	Program:		<b>LOC Table</b>							
2	Instructor:		Program-level learning outcomes (PLOs)							
3	Course number									
4		Course learning outcomes	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
5										
6										
7										
8										
9										
10										
11										
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21										
22										
23										
24										

In what ways do you incorporate collaborative learning into the course?

Do the Students generally knowledge and skills to be

## Regardless of the Method:

- Clear and ongoing communication are critical
- Have a strategy for mapping support
- Identify who will be responsible for data representation

## Examples of Scales to Map Course Outcomes to PLOs

There are a variety of scales that can be used to indicate the degree to which a program-level learning outcome is addressed by a particular course outcome. The following are examples that can be used or adapted. It is critical that all instructors are using the same scale when completing their maps, and that they are on the same page regarding the meaning of the terms used in the scale. Therefore, it is recommended that a definition of the terms is provided to instructors and that they have the opportunity to discuss and work with the scale prior to using it to map their courses.

### Examples of Potential Scales:

**Introduced (I):** Key ideas, concepts or skills related to the learning outcome are introduced and demonstrated at an introductory level. Instruction and learning activities focus on basic knowledge, skills and/or competencies and entry-level complexity.

**Developing (D):** Learning outcome is reinforced with feedback; students demonstrate the outcome at an increasing level of proficiency. Instruction and learning activities concentrate on enhancing and strengthening existing knowledge and skills, as well as expanding complexity.

**Advanced (A):** Students demonstrate the learning outcome with an increasing level of independence, expertise and sophistication expected upon graduation. Instructional and learning activities focus on and integrate the use of the content or skills in multiple levels of complexity.

(Adapted from Veltri, Webb, Matveev & Zapatero, 2011).

**Introduced (I):** Concepts are introduced in the course but not assessed.

**Competency (C):** Students are expected to reach a level of competency regarding the outcome. Students are assessed on the learning outcome.

**Advanced (A):** Students are expected to reach a level of proficiency regarding the outcome.

**Novice (N):** Beginning level of understanding or performance.

**Competent (C):** Adequate level of understanding or performance.

**Proficient (P):** Advanced level of understanding or performance.

**Introductory (I):** Beginning level of understanding; not assessed in the course.

**Comprehension (C):** The learning outcome is assessed for mental understanding.

**Applied (A):** Concepts are applied by the student and assessed. Examples: project work, problems, calculations, and demonstrations.

**Introduced (I):** Concepts are introduced in the course but not assessed.

**Practiced (P):** Students practice their ability and understanding of the learning outcome.

**Demonstrated (D):** Students demonstrate their ability and understanding of the learning outcome.

**Comprehension (C):** Students comprehend concepts or topics. Student assessment focuses on knowledge and comprehension of material.

**Application (A):** Students are asked to analyze or apply concepts or topics. Student assessment focuses on analysis or application; for example, problem-solving or essays.

**Evaluation (E):** Students used concepts or ideas to evaluate within the discipline or create something new. Examples include project work or generating plans for a client.

Another approach would be to use the ICE (Ideas, Connections, Extensions) model developed at Queen's University by Fostaty Young and Wilson (2000), based on Bloom's Taxonomy:

<b>Ideas</b>	Ideas represent the building blocks of learning. They can be discrete 'chunks' of information; facts, definitions, vocabulary, steps in a process; or discrete skills. Assessed by tasks requiring (or allowing) recall and repetition of information from books or from lectures.
<b>Connections</b>	At the subject or topic level, connections are made by making appropriate links between ideas (or chunks of information). At the personal or broader level, connections are made by relating new knowledge to what is already known, in a course, in other courses, or in a student's personal or professional experience.
<b>Extensions</b>	Extensions involve re-working students' knowledge and understanding by extrapolating, predicting outcomes or working out implications.

## Decisions to be made for all Curriculum Mapping Approaches

Decision	Notes
<b>Method or Tool</b>	
Curriculum Alignment Tool (CAT)	
Online survey tool	
Paper-based method	
Excel template	
Other	
<b>Mapping Scale</b>	
Introduced, Developing, Advanced	
Novice, Competent, Proficient	
Introductory, Comprehension, Applied	
Introduced, Practiced, Demonstrated	
Comprehension, Application, Evaluation	
Ideas, Connections, Extensions	
Other	
<b>Communication Plan</b>	
About the mapping process	
<b>What gets mapped</b>	
Course outcomes to PLOs, teaching and learning activities, student assessments	
Which courses? Required, fulfill a requirement, all?	
All sections or one?	
<b>Timeline and Deadlines</b>	
Introduce CM to instructors	
Initial deadline to map all courses	
Second deadline	
<b>Support for Instructors</b>	
Tech support	
Support the process, curriculum terms, etc.	

Decision	Notes
What to do if an instructor does not map his/ her course	
Who is responsible for aggregating the data	
How to present the data	Can be determined later
Who analyzes the data	Can be determined later

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