TIDES Instruct – Curriculum Redesign Process

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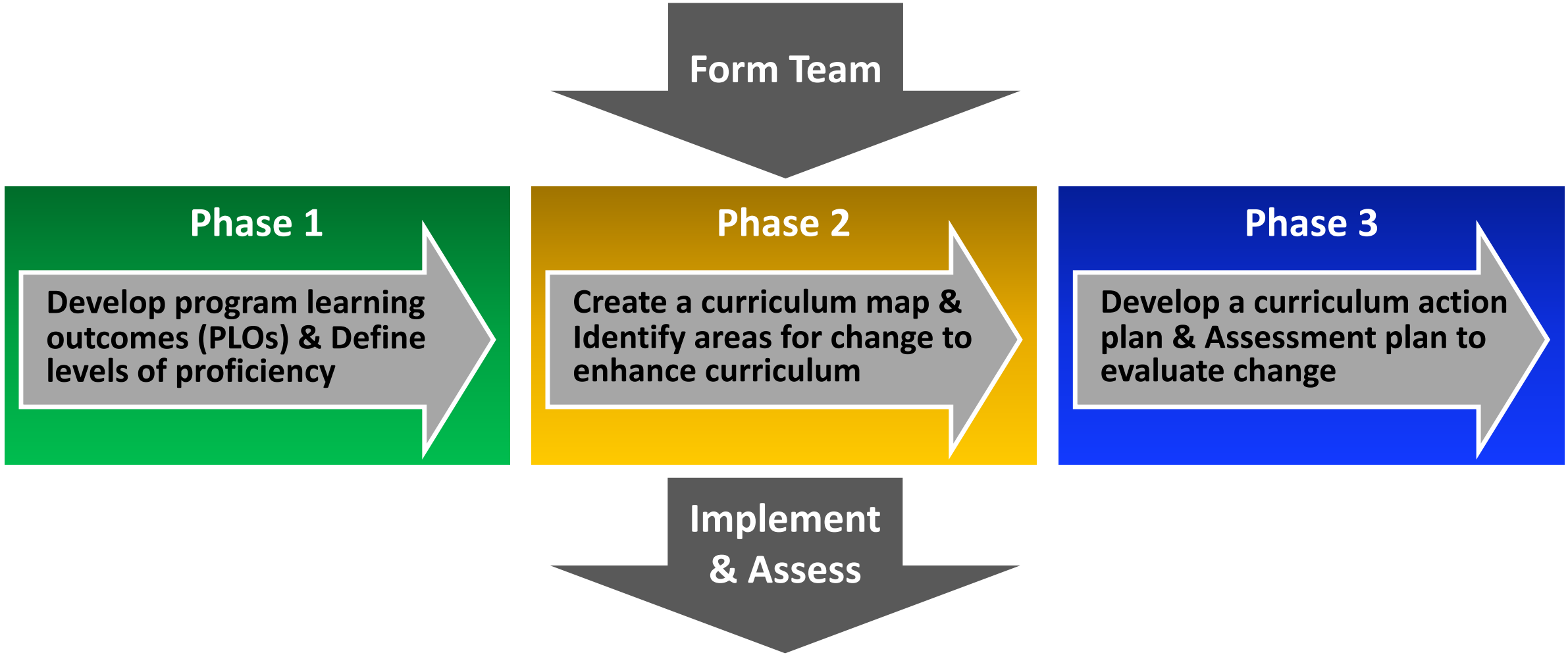
Outcomes of curriculum redesign:

1. Improve internal curriculum alignment
2. Increase opportunities for authentic and experiential learning
3. Prepare students for 21st Century workforce challenges and demands
4. Open communication between students, faculty, & other stakeholders
5. Embedding program assessment for continued improvement

Curriculum redesign plan:



Developed from Kotter. 1996. ***Leading Change;***
& Fowler et al. 2015 ***J. Transformative Learning***; Fowler et al. 2016. ***J. Faculty Development***

What is a curriculum map?

	Course A	Course B	Course C	Course D	Course E	Course F	Course G	Course H
PLO 1	I	I	I	D		D	D	M
PLO 2	I					D	M	M
PLO 3	I	I		D		D		
PLO 4				D			M	M
PLO 5		I	I	D		M		M
PLO 6			I					M

What is a curriculum map?

Curriculum maps show:

- Program Learning Outcomes (PLOs) – a combo of content knowledge and skills
- Degree Required Courses
- Matrix / Map for where those knowledge & skills are accomplished in the degree courses.
- Levels of proficiency for each PLO can be included in mapping. (*Introduce, Develop, and Master)*

Curriculum Map Example - *Physics*

PLO ↓ \ Course →	301 - Mechanics	101L - Mechanics Lab	110C - Seminar / Topics	315 - Waves	115L - Waves Lab	316 - E&M	116L - E&M Lab	355 - Modern & Thermo	353L - Modern Phys Lab	336K - Classical Dynamics	352K - Classical Electrodynamic	373 - Quantum I	329 - Computational Physics	352L - Classical Electrodyna	369 - Thermo & Stat Mech	362K - Quantum II	474 - Advanced Lab	333 - Optics	133L - Optics Lab	362L - Particle / Subatomic	345 - Biophysics	338K - Electronic Techniqu	336L - Fluid Dynamics	371C - Research / Indiv Study	375D - Intro to Plasma Phys	375R - Intro to Relativity	375S - Intro to Solid
Demonstrate knowledge in Core Physics areas: Mechanics	I	I		I	I			D		D													M	M	M	M	
Demonstrate knowledge in Core Physics areas: E&M				I	I	I	I				D			D				M				M		M	M	M	
Demonstrate knowledge in Core Physics areas: Stat. Mech.								I							D						M			M	M		M
Demonstrate knowledge in Core Physics areas: Quantum								I				D				D		M		M	M	M		M	M		M
Core - Problem Solving	I			I		I		I, D		D	D	D		D	D	D		M		D	M	M	M	M	M	M	M
Messy Problem - Identify Concepts	I	I		I	I	I	I	I	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	M	D	D	D
Messy Problem - Devise Solution	I	I		I	I	I	I	I	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	M	D	D	D
Messy Problem - Connections	I	I		I	I	I	I	I	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	M	D	D	D
Mathematical Methods - Proficiency	I, D			I, D		I, D		I		D	D	D	D	D	D	D		D		D		D	M	M	M	M	D
Mathematical Methods - Application	I, D			I, D		I, D		I		D	D	D	D	D	D	D		D		D		D	M	M	M	M	D
Computation - Programming		I,D			D	I?	D						M											M			
Computation - Tools		I	I				I			D	D	D	D	D		D				D	?	D	?	M	M?	M?	M?
Lab - Instrumentation		I			I		I		D								M		?		?			M			
Lab - Analysis		I			I		I		D								M		?		?			M			
Scientific Literacy - Locate		I	I				I		I, D								D, M							M			
Scientific Literacy - Interpret		I	I				I		D								M							M			
Scientific Literacy - Evaluate		I	I				I		D								D, M							M			
Communication - Writing		I					I		D								D		I?					M			
Communication - Oral	I		I	I		I			D								D							M?			
Flags:	QR			QR		QR			Wr								II, QR, Wr							II			

Notes:

1.) I = Introduced, D = Developing, M = Mastery.

2.) Flags:

QR = Quantitative Reasoning

II = Independent Inquiry

Wr = Writing (2 required)

E&L = Ethics & Leadership

Curriculum Map Example - *HDFS*

	Sub-PLOs	LOWER DIVISION - Mapped									UPPER DIVISION - Mapped																								
		HDF 304 Instructor A	HDF 304 Instructor B	HDF 304 Honors	HDF 313 Instructor A	HDF 313 Instructor B	HDF 113L	HDF 315 Lab Instructor A	HDF 315 Lab Instructor B	HDF 335	HDF 337	HDF 338	HDF 340	HDF 342	HDF 343	HDF 347	HDF 345	HDF 351	HDF 360	HDF 362	HDF 371	HDF 372K	HDF 355 Instructor A	HDF 355 Instructor B	HDF 355 Instructor C	HDF 355 Instructor D	HDF 466	HDF 652P	HDF 378K Instructor A	HDF 378K Instructor B	HDF 378L Instructor A	HDF 378L Instructor B	HDF 378L Instructor C
PLO 1	1A: Pre-natal, infancy, and toddlerh	I	I		I;D;M	I;D						I;D;M		I;D;M			I;D;M	I;D;M	D	M							I;D			D	I;D;M	M	D
	1B: Childhood	I		I;D	I;D;M	I;D	I					I;D;M		I;D;M	M	D	I;D;M			M							I;D		M	M	D;M	M	D
	1C: Adolesence and emerging adult	I			I;D;M	I				I				I;D;M	M	D;M	I;D;M		M	M	I;D;M		I						M	D	I;D;M	M	
	1D: Adulthood and aging	I	I;D;M	I;D						M	I;D;M					D;M							M						M				
	1E: Lifespan Development	I	I	I	I;D;M	I	I				I	I;M		I;D;M		M	I;D;M	I;D;M	M			I;D;M									I;D;M	D;M	D
	1F: Family relationships	I	I	I;D						D	I;D;M				M		I;D	I;D			I;D		D						M		I;D;M	M	
PLO 2	2A: Biological and Motor				I;D;M	I;D				M				D;M		M		I;D;M			I;D;M						I;D				D;M		I;D
	2B: Cognitive				I;D;M	I;D;M	D			D		D		I;D;M			I;D;M	I;D;M			I;D;M						I				I;D;M	D;M	I;D;M
	2C: Socio Emotional			I	I;D;M	I;D;M				M	I;D			M	M		I;D;M	I;D;M			I;D;M		M				I		M	M	I;D;M	D;M	I;D
	2D: Gender Concepts	I	I	I	I;D;M	I;D				D						I;D;M	I;D;M	I			I;D;M						I;D;M		M	I;D;M			
PLO 3	3A: Formation	I	I;D	I		I	I;D				I;D;M										I;D;M						I;D							
	3B: Dynamics	I	I;D	I			I;D				I;D;M	D		D		I;D;M			I;D;M								I;D		M		I;D;M		D
	3C: Disruption	I	I;D	I							I;D	D		D		I;D;M					I;M												
	3D: Impact on health	I	I;D	I;D							I	D		D		I;D					I								M		I;D;M		
PLO 4	4A: Childhood and adolescence											D	I;D;M	D	M	I;D;M	I;D	I;D		I;M	I;D;M						D		M	I;D;M			D
	4B: Family and intimate relationship	I	I;D;M	I		I					I;D		I;D;M		M	I;D;M					I;D						D		D	I;D;M			D
	4C: MIddle and older adulthood		I										I;D;M			I;D;M													D	I;D;M			
PLO 5	5A: Application of human developm	I	I	I	I;D					D	I	D		D	M		I;D;M	I;D;M	D;M		I;D;M		I	D						D	D	I;D;M	I;D	I;D
	5B: Application of theories of family	I	I;D	I							I;D								D;M		I;D		I							D		I;D;M		I;D
	5C: Application of methods	I	I	I;D;M	I;D	I;D		I;D;M	M		I;D						I;D;M	I;D;M			I;D		D	I;D;M			I			D				
CNS Skills	Skill 1A: Communication (written)		I;D				I	D;M	M	D	I;D	D;M	I;D	D	M	I;D;M	I;D;M	I;D	I;D;M	D;M	I;D;M	D;M	D;M	D;M			I			D	D;M	I;D;M	I;D	I;D;M
	Skill 1B: Communication (oral)			I;D	I		D	I;D		M			I;D;M		M	I;D;M	I;D	I;D	I;D;M	D;M	I;D	I;D;M	M	I;D;M	I;D;M		I;D		D	I;D;M	I;D;M	I;D	D
	Skill 2: Information literacy		I	I;D;M	I		D	I;D;M	M	D	I	D	I;D	D	M	I;D;M	I;D;M	I;D;M	I;D	ID;M	I;D;M	I;D;M	D	I;D;M					D		I;D;M	D;M	I;D
	Skill 3: Computational/technology		I	I				I;D;M	M								I	I			I;D;M	I;D	D	I;D;M									
	Skill 4: Self-directed learning			I	I;D		I	I;D;M				D	I;D;M	D	M	I;D;M	I;D	I;D	I;D;M	ID;M		I;D;M	D;M	I;D;M	I;D		I	D		I	I;D;M	D	D;M
	Skill 5: Teamwork							I;D;M		D		D	I		M	I	I;D	I;D	I		I;D;M		D	I;D;M	I;D;M		D	D	M	I;M	I	M	

I = Introduce
D = Develop
M = Master

Summary – Curriculum Map Use:

1. Identify gaps in curriculum / degree plan
2. Identify redundancy
3. Evaluate course sequencing
4. Alignment between instructors.
5. Clear Communication to students, faculty, & other stakeholders.
6. Tool for advising
7. Opportunities for assessment to be used & embedded into PLOs.

Who belongs on a curriculum redesign team?

Department Action Team (DATs) Model – e.g. Corbo et al. & Fowler et al.

- ***Includes:*** 4 to 8 Faculty members (depending on Department size)
- ***Facilitators:*** Committee chair (faculty member) + STEM Instruction Consultant as external facilitator (UT Austin TIDES model).
- ***Optional*** - Other stakeholders: staff, academic advisors, undergraduate and/or graduate students.

Corbo et al. DAT Model - https://www.colorado.edu/project/dat/implementation

Curriculum Department Teams - Roles:

STEM Instruction Consultant	Committee Chair (Faculty Member)	Other Committee Members
Faculty buy-in	Commitment to process	Commitment to process
Focus on change	Lead large scale department communication & input	Shared Effort / All members participating
Encouraging Productive Teams	Decision making	Decision making / All members have voice
Resource Support (data collection)	Lead initial construction of tools / prompts	Provide Input
Liaison between Departments, College & Other	Communicate Shared Vision with committee / department	Help develop shared vision

Program Learning Outcomes (PLOs)

What are they?

Statements explicitly outlining what students should be able to do when they graduate from the program.

Learning outcomes should:

- Be student-centered
- Contain a measurable action verb
- Provide context

Program Learning Outcomes (PLOs)

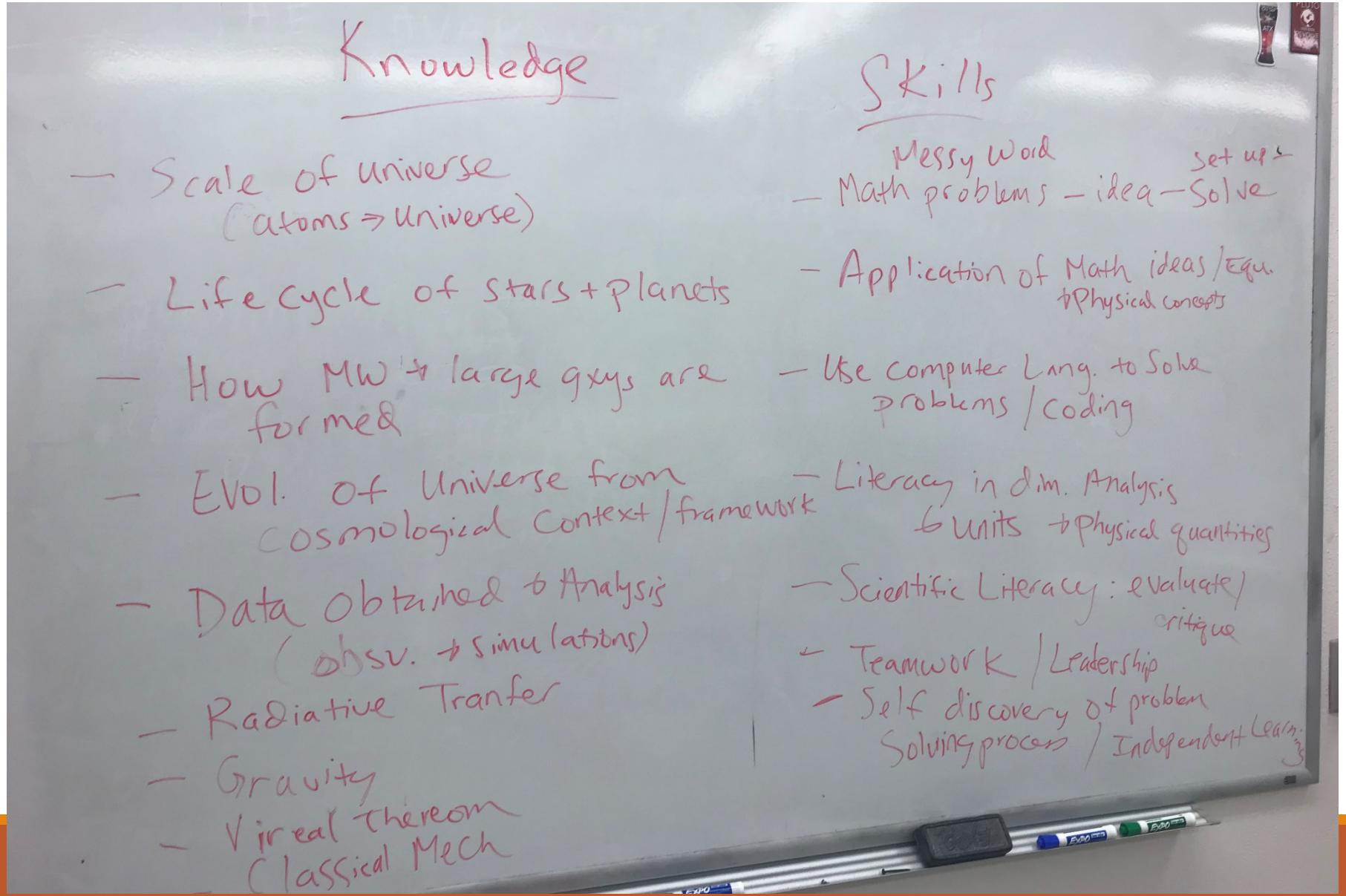
Textiles & Apparel

Students will be able to evaluate the properties and performance of fibers, textiles, and textile products.

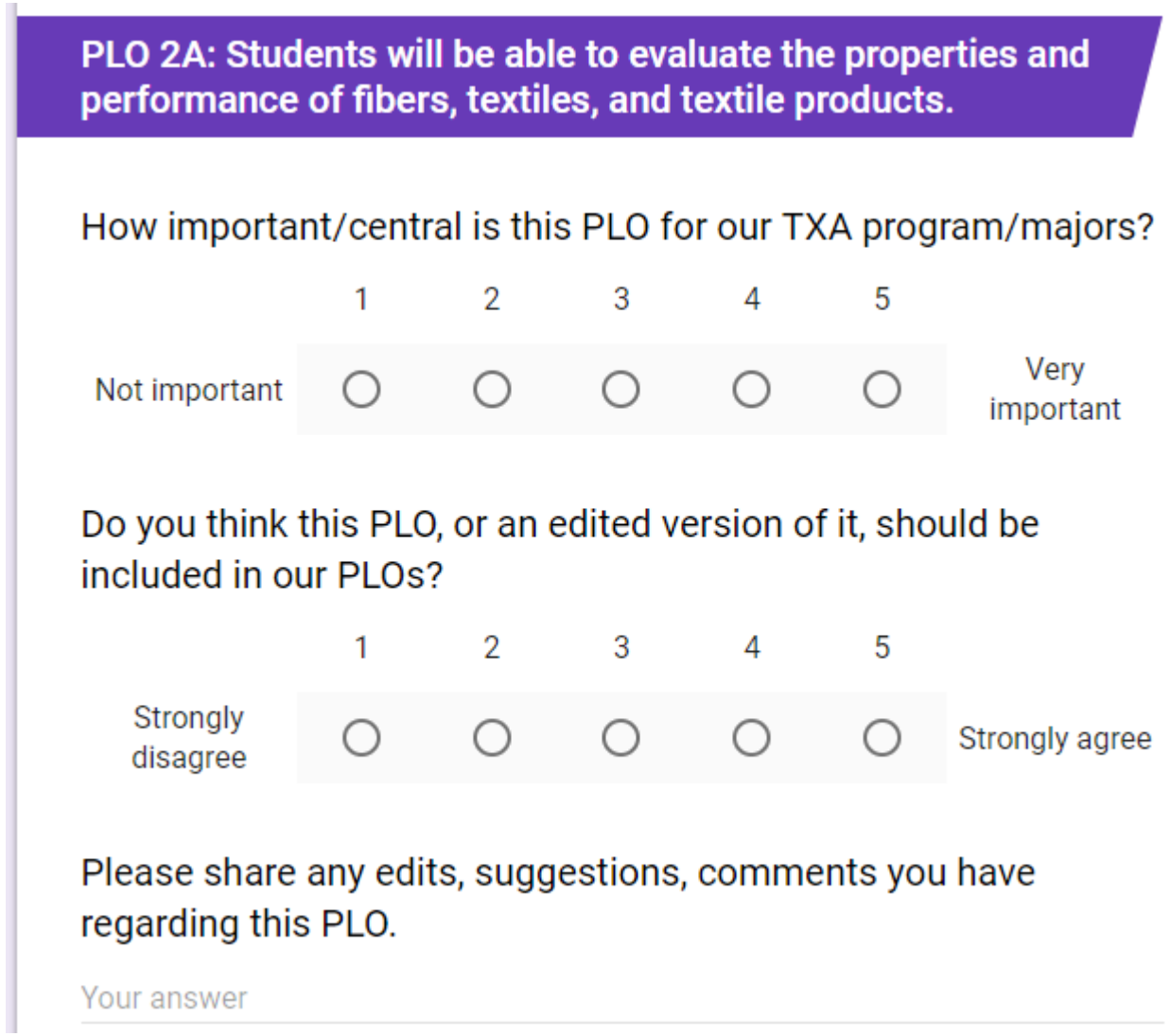
Learning outcomes should:

- Be student-centered
- Contain a measurable action verb
- Provide context

First step: Brainstorm and organize ideas into knowledge and skills



Then…evaluate and re-write PLOs…….several times!



PLO 2A: Students will be able to evaluate the properties and performance of fibers, textiles, and textile products.

How important/central is this PLO for our TXA program/majors?

	1	2	3	4	5	
Not important	○	○	○	○	○	Very important

Do you think this PLO, or an edited version of it, should be included in our PLOs?

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Please share any edits, suggestions, comments you have regarding this PLO.

Your answer

Ready to map? Probably not yet!

Students will be able to effectively communicate.

“What kind of communication do you mean?”

“How do I determine what level my students are performing at?”

Break PLO down and define levels of proficiency

Students will be able to effectively communicate.

Criteria	Introductory	Developing	Mastery
Oral	Participate regularly in class	Facilitate and participate in an in-class group driven discussion	Give a formal oral presentation, in a group or individually
Written	Compose a well-written short answer (e.g., on an exam)	Compose a short paper or essay	Compose a formal research paper

- **Introductory:** 1st exposure, can recall and explain knowledge
- **Developing:** 2nd/3rd exposures, can apply and analyze knowledge
- **Mastery:** Additional exposures, can evaluate and create knowledge

Mapping your favorite course

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Curriculum Redesign Action Plan:

Using a curriculum map to identify areas for change.

Assessment of change.

Surprising high-impact outcomes.

Putting everything together: Developing a curriculum redesign action plan

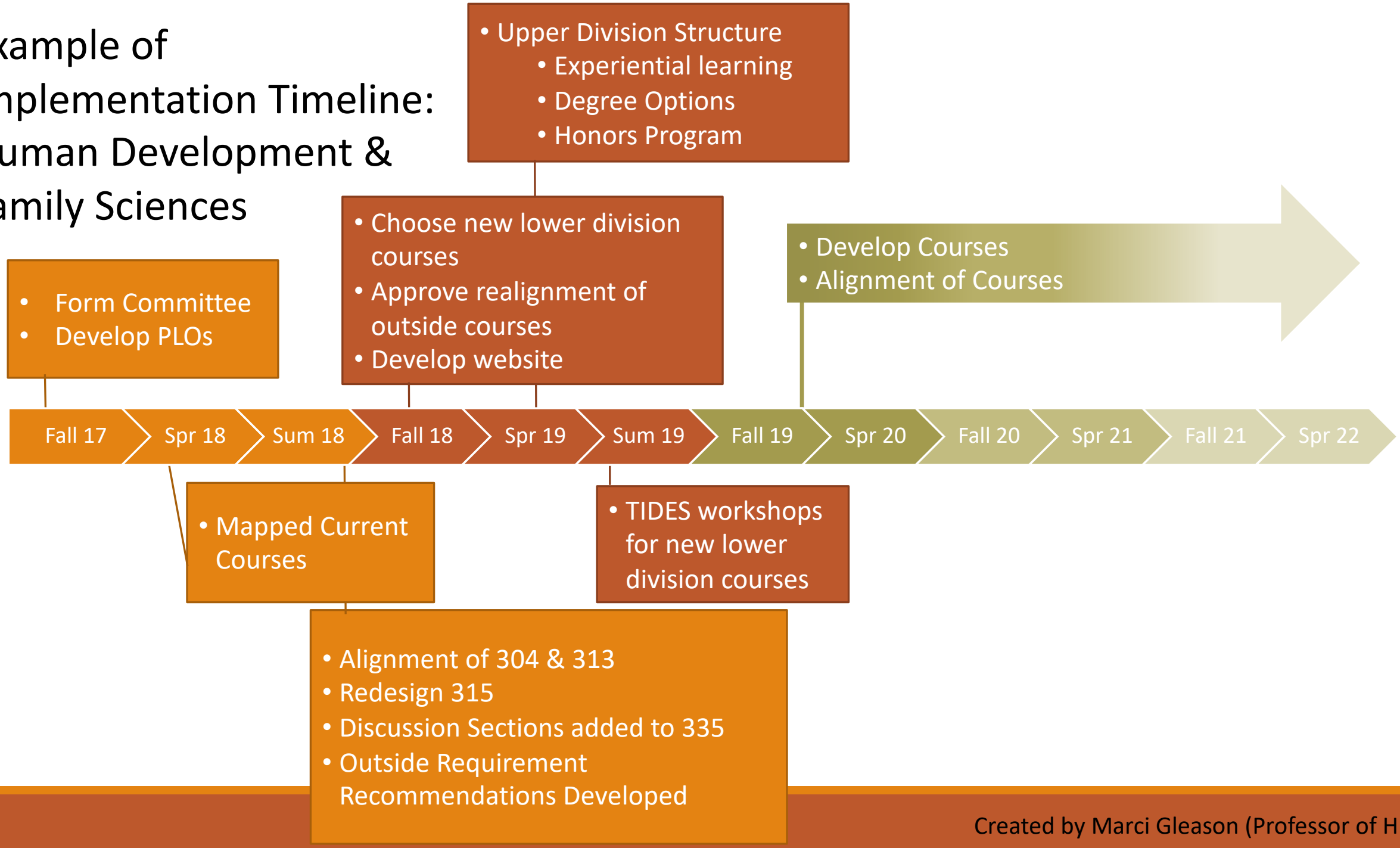
Surprising high-impact outcomes:

- Culture improvement within the department, such as:
  - Increased curriculum discussions between faculty members
  - Increased student engagement in the department
- Dealing with inconsistencies in college preparation
- Improving career awareness and preparedness

Examples of Implementation Recommendations: Physics

Goal	Type	Actions	Timeframe	Person(s)
One-time and recurring tasks for Undergraduate Affairs Committee				
	PP	Revise the prerequisites and course descriptions in the undergraduate catalog in accordance with the implementation of curriculum review items.	Summer 2018	UG affairs committee
	D	Share rubrics and learning objectives for each class with faculty teaching class that semester. Encourage including this info on syllabus.	Every semester	Staff or UG affairs committee
	D	Share information about available common resources (modules) to faculty in applicable courses	Every semester	Staff or UG affairs committee
Redesign intro labs				
	CR	Engage faculty (Yeazell)	Spring 2018	curriculum review committee
	CR	Participate in course redesign workshop	Summer 2018	Instructor, TIDES
	CR	Modernize lab equipment	Summer 2018	Instructor, TIDES
	CR	Teach and evaluate new modules	Fall 2018, Spring 2019	Instructor, TIDES
	CR	Make new modules and manual available as a common department resource.	Fall 2018, Spring 2019	Instructor, TA
Introduce computational component in intro classes				
	CR	Engage faculty, teaching postdoc	Spring 2019	curriculum implementation committee
	CR	Design modules for lectures and assignments	Summer 2019	Instructor, teaching postdoc
	CR	Make new modules and manual available as a common departmental resource.	Summer 2019	Instructor, teaching postdoc

Example of Implementation Timeline: Human Development & Family Sciences



Created by Marci Gleason (Professor of HDFS)

Action plan ≠ Action has happened

Path to Sustainability:

- Creating ownership and accountability
- Incentives for departments and faculty
- Checking in regularly
- Normalize the process

Thank you!!

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