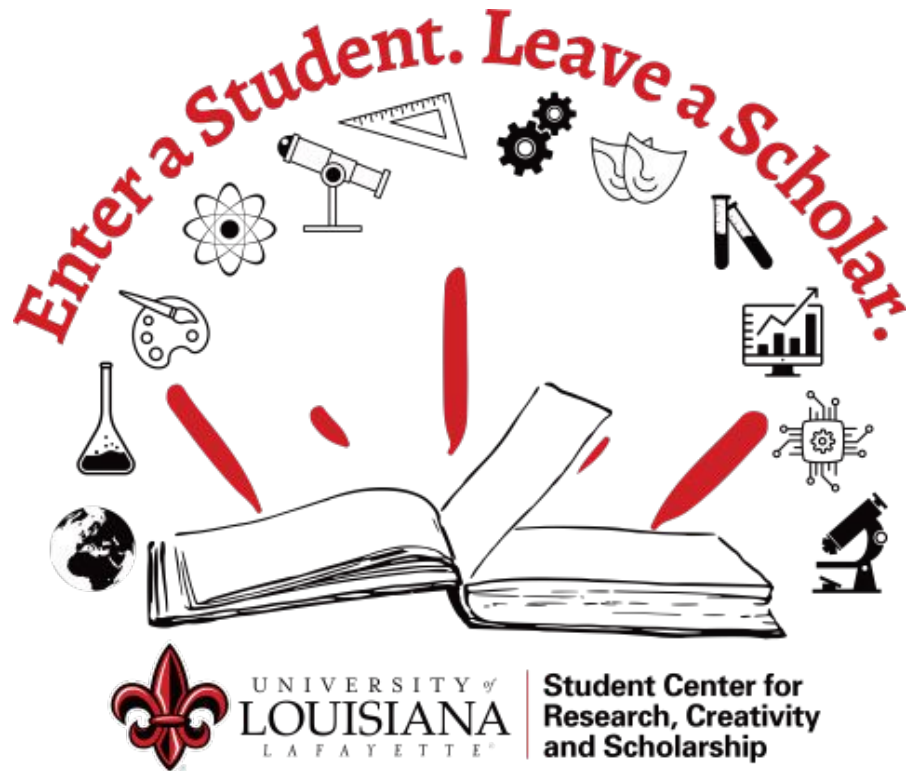


The CURE for Research Participation

Participants will explore, collaborate, and design sustainable research experiences appropriate for their undergraduate courses.



1:00 Inoculating the Culture
3:00 CUREing your own Classes

Presented at SCRCs Advance Faculty Summit - August 17, 2022
Phyllis Baudoin Griffard, PhD, Master Instructor in Biology

“Advance is a UL Lafayette initiative to provide all students the opportunity to participate in high-impact projects.”

Goals

Advance is a significant step for UL Lafayette in the establishment of a highly effective UR program. Although the University aims eventually to produce a comprehensive UR program, *Advance* focuses narrowly on three **goals that create the conditions** for SLOs to be met.

1. Provide more students with the opportunity to complete an SRE.
2. **Develop a campus culture** that supports and rewards participation in high-impact research, scholarship, and creative activities.
3. Prepare students to present and publish their work.

from advance.louisiana.edu

Today's workshop will be interactive and task-oriented. More resources about CUREs and UL's QEP are available at advance.louisiana.edu.

About the facilitators

Inoculation

Introduction of a small amount of something potent in order to:

- Bolster a body's defenses against disease
- Scale up the germinal capacity of a system

Social Science Analogs

- Inoculation Theory: pre-exposure to weakened versions of a stronger, future threat improve resistance to it
- Social Contagion: spreading of emotions or behaviors through a system



Wikimedia Commons



PBS Learning Media



A resilient, sustainable culture is diverse, generates a broad spectrum of products, and resists contamination.

Institutional progress can be impeded by unchecked assumptions about its culture.

Inoculating the Culture addresses the larger academic context in which research-rich courses will increase and become the norm at UL-Lafayette

Objectives: By the end of this workshop and throughout the semester, faculty participants can:

1. Explain to a colleague **what CUREs are** and give an example.
2. Describe to a colleague the **current context** at UL for teaching with CUREs.
3. Propose several **actions** you can take this semester to make sustainable improvements to the culture at UL for CUREs.

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What do you already know? Turn to your neighbor.

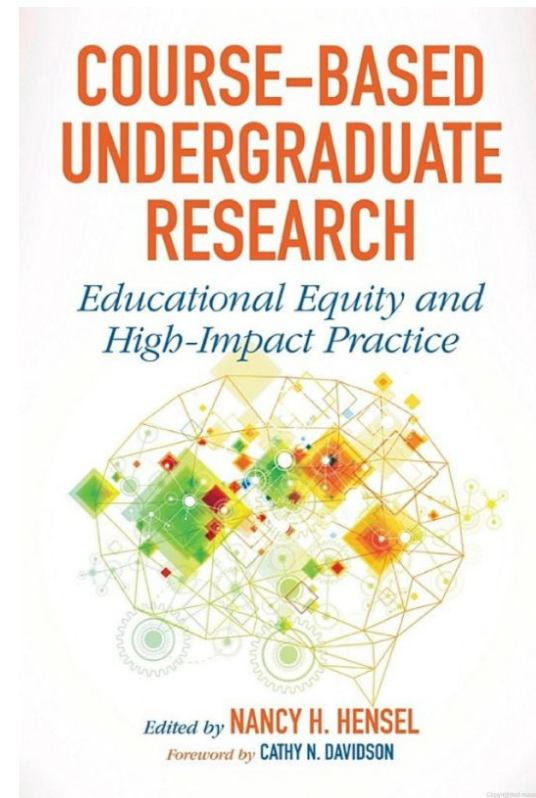
1. Explain to a colleague **what CUREs are** and give an example.

CURE: Course-based Undergraduate Research Experience

“**whole classes** of students address a research question or problem with **unknown outcomes** or solutions that are **of interest to external stakeholders.**” -Erin Dolan

CURE criteria (especially in first two years):

- Research is **embedded into the course** curriculum
- **All** students engage in the research project
- Outcomes are **unknown** beforehand
- Students work **collaboratively**
- Projects introduce students to the research **methodologies** of the discipline
- Outcomes are **communicated** publicly



UL's definition of SREs

UL Lafayette defines an SRE as a sustained effort by a student to apply subject knowledge, skills, and abilities to a project that is valued by the discipline. An SRE may include

- systematic inquiry in order to discover facts, principles, or perspectives;
- contextual analysis or comparison to provide unique interpretations;
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- contextual analysis or comparison to provide unique interpretations;
- application of professional skills;
- creation of unique visual and performing arts; and
- production of documents that contribute to a discipline or community.



MUREs or CUREs?

Only way to give every student a SRE is CUREs

Course-based Undergraduate Research Experiences

- Required of all in a course
- Equitable
- Not capacity-limited
- Engages more mentor tiers
- Goal to produce citizens with scholarly mindset who know how claims are validated
- “Little r research”

Mentored Undergraduate Research Experiences

- Opt-in, selective
- Elite, privileged, neurotypical
- Capacity-limited
- Time-intensive for mentor
- Goal to produce academic researchers and publishable claims
- “Big R Research”

Is this a CURE?

Race and Ethnic Relations examines the evolving nature of America's social and cultural diversity and the issues of racial prejudice, hatred, and discrimination in the country. Students complete the final paper based on research on the relationship between race and incarceration. The research utilizes arrest data from the Bureau of Justice Statistics website. Students derive the research questions and corresponding hypotheses based on their review of literature.

Based on their data analysis, they attempt to explain or interpret the arrest data on the relationship between race and the arrest rates by types of crimes. The groups will prepare the final group paper and present the findings in the class. The proposed CURE incorporates a STEM component into social science as students run forecasting models for an important social problem in the USA.

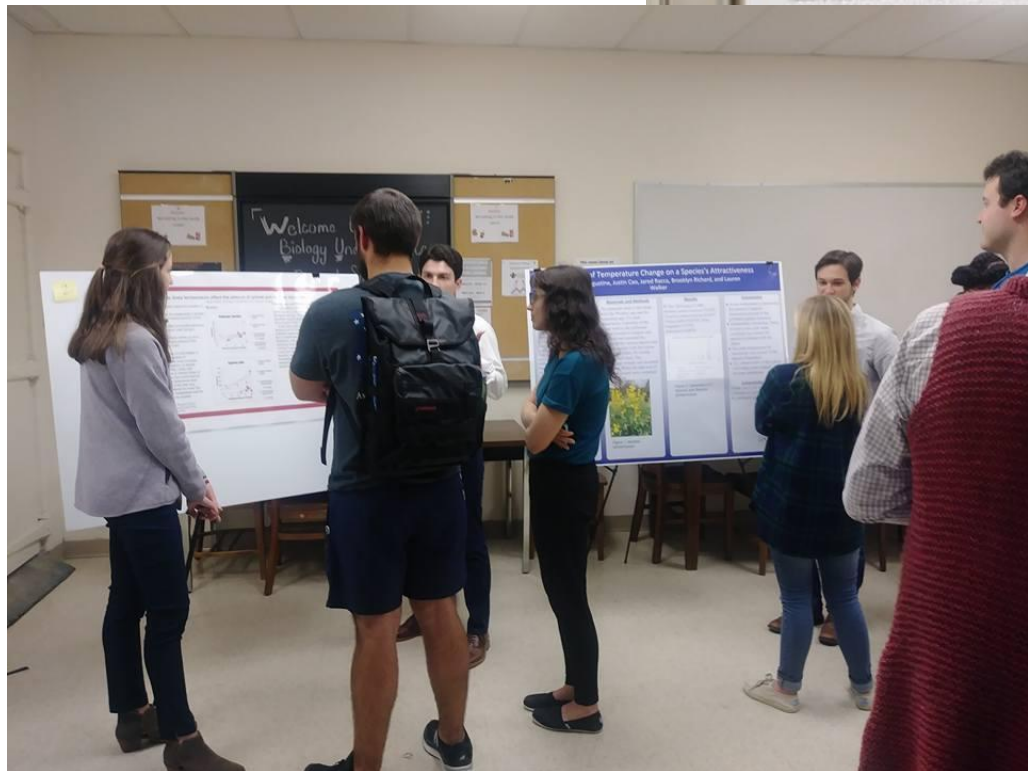
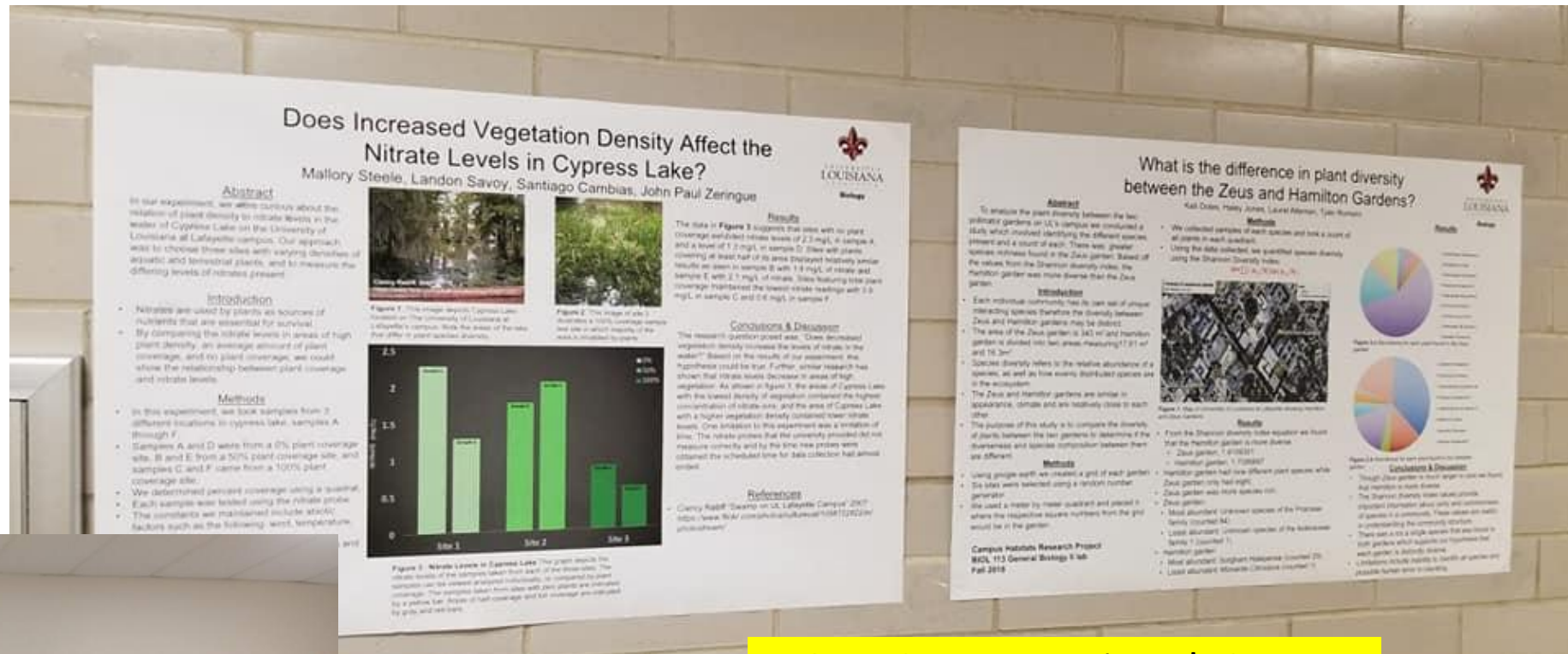
Is this a CURE?

HIST 319, History of Women and Diversity in the United States, is a mid-level, undergraduate class for both majors and nonmajors that focuses on a broad range of women's experiences in order to interrogate the notion of diversity in the United States. Specific areas of investigation include women and work, abolition, suffrage, reproduction, sexuality, civil rights, feminism, education, sports, and the arts, as well as the role of women in society and the family. Particular attention is paid to race, ethnicity, and class in order to understand more fully women's roles across cultures and over time.

Students assume that that to be a historian is to memorize dates, events, and people from the past. To challenge that assumption, I have redesigned to help them understand that *to be a historian requires many skills, most of which center on the identification, analysis, and synthesis of source materials.*

Learning Goals: students will learn to read like historians, write like historians, and speak like historians. I am restructuring the class, so that they can mimic professional historians' work. (Professional historians do not, for example, take identification and short answer exams even though we ask our students to do so in many of our classes.)

Is this a CURE?



BIOL113 Intro to Bio Lab 2
Required of all science majors
Campus Habitats: a multiweek ecology research project that students conducted in teams to address original question with equipment and longitudinal database. Peer review, Public poster and research report.

What do you know now? Turn to your neighbor.

1. Explain to a colleague **what CUREs are** and give an example.

What do you already know? Turn to your neighbor.

2. Describe to a colleague the **current context** at UL for teaching with CUREs.

Exemplar harvest:

What courses already include CUREs? (We'll collect these)

Course #
Course name
For majors? Required or elective?
Description

BIOL113 Intro to Bio Lab 2

Required of all science majors

Campus Habitats: a multiweek ecology research project that students conducted in teams to address original question with equipment and longitudinal database. Peer review, Public poster and research report.

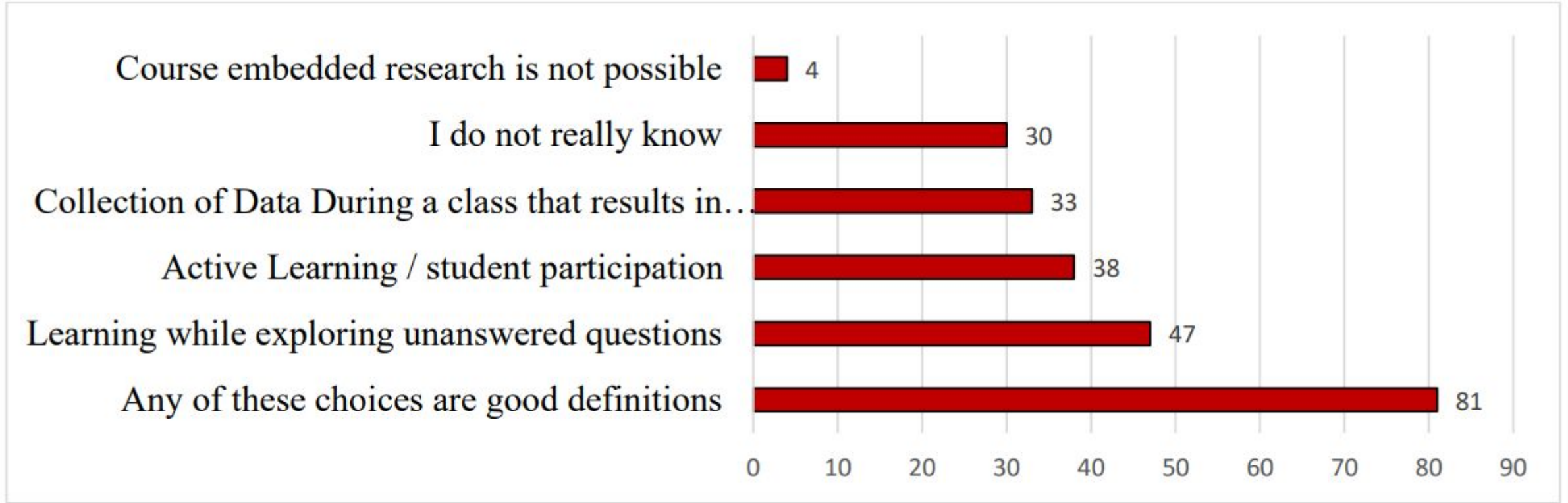
Available descriptions of current context:

- UL's [Undergraduate Research Report](#) takeaways

“UL Lafayette administers the National Survey of Student Engagement (NSSE) ... Results from the NSSE indicate that **undergraduates at UL Lafayette perceive that they are not getting enough opportunities to conduct research with faculty members.**”

“The responses from seniors [about whether they did research with a faculty member] are **statistically behind the University's Carnegie classification peers.**” (This was 2021 when we were still R2)

from advance.louisiana.edu



Of 114 respondents

Graph nine: Measure of respondent replies to the question “What is course embedded research?”

What does your physical and virtual space convey?

Audit the vibe in your building, website and social media.

What would a visitor think? Parent, alumna, colleague, celebrity

Turn to your neighbor

Neurobiology

Karen Smith Lab



Exploring FGFs and Astrocyte - Neuron Interactions Impacting Mental Health



Research:



Marques
Study: Self Injurious Behavior
Model: Human Mice
Techniques: qPCR, Immunohistochemistry, Microscopy



Levi
Study: Cerebellar Ataxia
Model: Transgenic Mice
Techniques: Behavior, Immunohistochemistry, Microscopy



Tara
Study: Memory
Model: Transgenic Mice
Techniques: Behavior, Immunohistochemistry, Microscopy



Dahlin
Study: Depression
Model: Transgenic Mice
Techniques: Tissue Culture, Behavioral Imaging, Microscopy



Undergraduate Trainees aka "Minnows"
Undergraduates work side by side with their graduate students.
Learning techniques
Collecting data
Presenting Findings at Local, National and International meetings



Presenting!

Graduated (We miss our lab mates)



William
(LSE Medical School, New Zealand)
at (VUM, Virginia Edward Via, Director
Dept of Pathologic Medicine) (LSE Medical School, New Zealand)



You can't become a biologist only by taking classes...

Find us on Facebook!
ULLafayetteBiology

Do research!

off campus

on campus

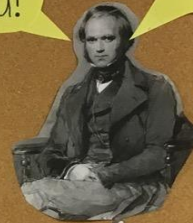
S.W.E Meeting
"Society of Women Engineers"

Society of Women Engineers
Aspire / Advance / Achieve

First General Meeting:
January 31, 2018
Madison 101
6:00 pm

Read!

Go to seminar!
4pm on Thursdays



Take a field course!

Volunteer!

Fort Johnson REU Program | Giroux Marine Lab, College of Charleston
Resilience and Response of Marine Organisms to Environmental Change
Summer 2018

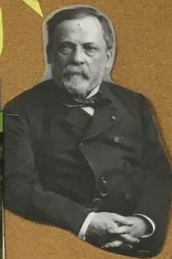
Learn about our REU Program
Researcher: Dr. Jennifer Griffard
2018 Research Program: Carbon Dioxide and Ocean Acidification

Contributing Partners:
COLLEGE OF CHARLESTON
CHARLESTON MARINE LABORATORY

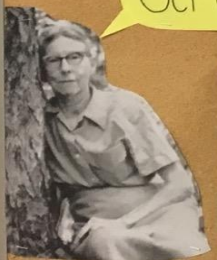
USGS
WHOOPING CRANE IDENTIFICATION

Want to help LDWF with whooping crane research?
See Dr. Griffard

www.wlf.louisiana.gov/whooping-cranes



Get outside!



Choctawhatchee National Wildlife Refuge
Chicot State Park Hiking Trail
Louisiana State Arboretum Trail Map

Louisiana State A.S.C.S. 2018 Branch Meeting

Meeting Features:
- Learn about the history and biodiversity of the "Cajun" Prairie
- Get hands-on experience propagating native plants
- Lunch benefits our program by providing Louisiana native prairie habitat
- Earn up to 3 BICOLD credit hours in a seminar - See Dr. Griffard

First come first served so apply ASAP!

Volunteer at the Ecology Center

The U.L. Ecology Center is partnering with the Biology Department to create priority habitat on campus and we need your help!

Volunteers will:
- Learn about the history and biodiversity of the "Cajun" Prairie
- Get hands-on experience propagating native plants
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Fisheries monitoring jobs

ALASKAN

ALASKAN Fisheries Monitoring Jobs

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U.L. Biology Colloquium

Of Mice and Mimulus: the genetic and phenotypic basis of adaptation to harsh environments

Dr. Kathleen Ferris
University of California, Davis

4 PM Thursday, February 1, 2018
Cookies & coffee at 3:45 pm
117 Billeaud Hall

Everyone is welcome

FIGHT FRAUD, WASTE

CONTACTING THE LLA HOTLINE

1-866-66-FRAUD-1000

U.L. Biology Colloquium

U.L. Biology Colloquium

U.L. Biology Colloquium

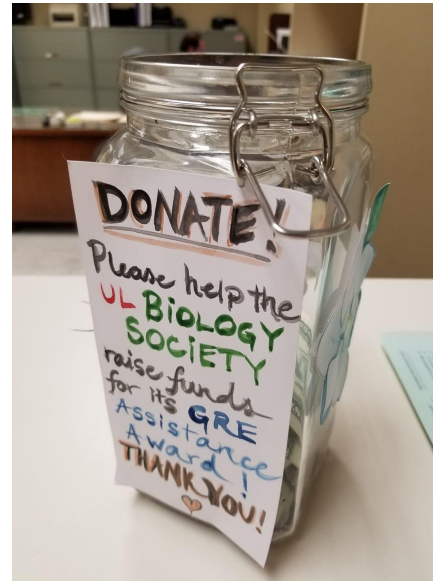
U.L. Biology Colloquium

U.L. Biology Faculty, staff or students are welcome to post here - Dr. Griffard



Facebook posts raise the profile of research and researchers

- Darwin Day in BIOL 111
- GRE fund
- Whooping crane interns visit research blinds
- Seminar announcements now state that UGs welcome



Faculty vibe:

What gets in the way of faculty imbedding research experiences into their courses?

Jot ideas on notes



Why not?

Things I've heard faculty say about students:

“My teaching evaluations dropped when I tried this.”

“Students hate group projects. There is a lot of drama and finger-pointing.”

“Students say what I'm doing is not the norm here. I don't want to be an outlier.”

“When I ask students to work together in class, they look at me like deer in the headlights.”

“It feels like I've wasted class time when I do stuff like this.”

Things I've heard from faculty about faculty:

“Faculty in upper level can't view lower level as trivial, that the purpose is just packing student heads with info they will need later... What needs to change in lower level is faculty need to feel empowered. Instead, I feel pressure to cover all this information and if I don't...”

“I hate hearing someone say that lower level is supposed to be about weeding out poorer students.”

“It's safer to keep what I'm doing in my classes to myself.”

How can the Why Nots be summarized?



Why not?

What do you know now? Turn to your neighbor.

2. Describe to a colleague the **current context** at UL for teaching with CUREs:

- Current CUREs
- Survey takeaways
- Vibe
- Why not

What do you already have in mind? Turn to your neighbor.

3. Propose several **actions** you can take this semester to make sustainable improvements to the culture at UL for CUREs.

Infographic poster for you

Who
What
Where
When
Why
How

**Sticky note for
Advance**

Who
What
Where
When
Why
How

What can you do to *Inoculate the Culture*?

Who
What
Where
When
Why
How

Ideas (solo or team):

- Post a reminder infographic in your office
- Meet with colleagues to summarize and elicit ideas for CUREs and feedback
- Draft public key messages like a syllabus statement or hallway poster
- Audit the vibe of your physical and virtual spaces and report
- Propose new ways to engage all tiers of your academic community
- Initiate a curriculum mapping and vertical integration review
- Plan a public event to raise the profile of UG research
- Find out and address faculty hesitation

How will you be sure you complete the action you propose? Want a buddy? Set a date.

Gallery walk: Half visit posters, then switch

3. Propose several **actions** you can take this semester to make sustainable improvements to the culture at UL for CUREs.

Any volunteers to summarize these at start of next workshop?

1. Explain to a colleague **what CUREs are** and summarize several examples and nonexamples for their discipline.
2. Describe to a colleague the **current context** at UL for teaching with CUREs.
3. Propose several **actions** you can take this semester to make sustainable improvements to the culture at UL for CUREs.

I welcome your updates! phyllis@louisiana.edu, 832 499 8249

The CURE for Research Participation

Participants will explore, collaborate, and design sustainable research experiences appropriate for their undergraduate courses.



1:00 Inoculating the Culture
3:00 CUREing your own Classes

Presented at SCRCs Advance Faculty Summit - August 17, 2022
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Goals

Advance is a significant step for UL Lafayette in the establishment of a highly effective UR program. Although the University aims eventually to produce a comprehensive UR program, *Advance* focuses narrowly on three **goals that create the conditions** for SLOs to be met.

1. **Provide more students** with the opportunity to complete an SRE.
2. Develop a campus culture that supports and rewards participation in high-impact research, scholarship, and creative activities.
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from advance.louisiana.edu

Today's workshop will be interactive and task-oriented. More resources about CUREs and UL's QEP are available at advance.louisiana.edu.

About the facilitators

What qualifies as a *Student Research Experience*?

UL Lafayette defines an SRE as a sustained effort by a student to apply subject knowledge, skills, and abilities to a project that is valued by the discipline. An SRE may include

- systematic inquiry in order to discover facts, principles, or perspectives;
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Can be CUREs or MUREs or SUREs

Today you'll design a CURE

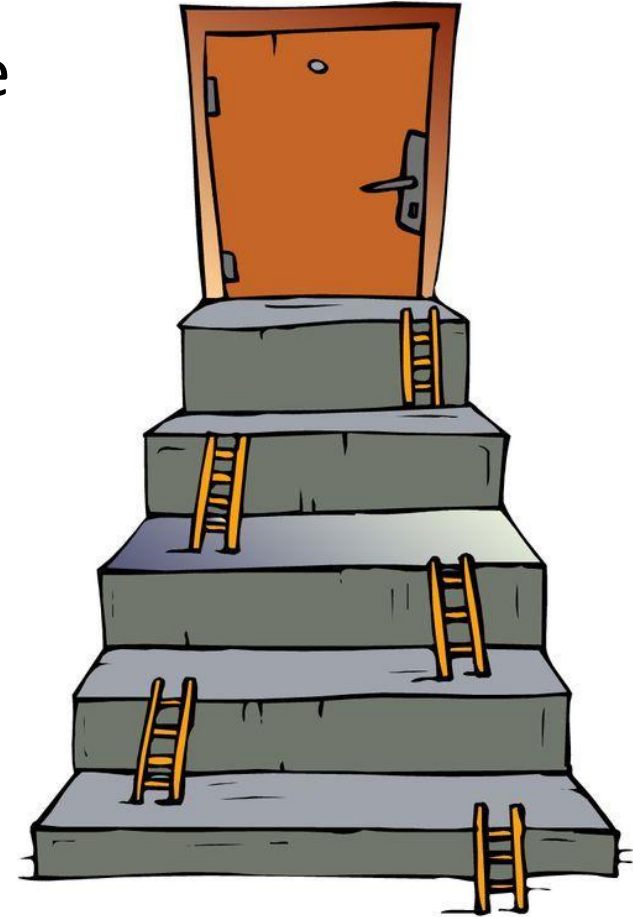
CUREing your own Classes

develop specific plans ready to add to your fall syllabi

Objectives: By the end of this workshop and throughout the semester, faculty participants can:

1. Explain to a colleague **what CUREs are** and give an example.
2. **Design** and evaluate a CURE appropriate for a course you'll teach this semester.
3. Propose several actions you can take this semester to **sustain** and continuously improve CUREs.

Goal: that you leave today feeling motivated, informed and supported to make a difference in the quality of undergraduate education at UL this semester.



What do you already know? Turn to your neighbor

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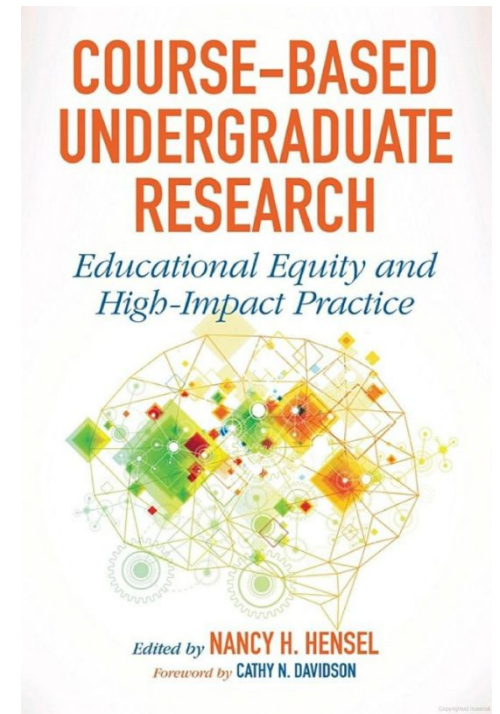
Who can report?

CURE: Course-based Undergraduate Research Experience

“whole classes of students address a research question or problem with unknown outcomes or solutions that are of interest to external stakeholders.” -Erin Dolan

CURE criteria (especially in first two years):

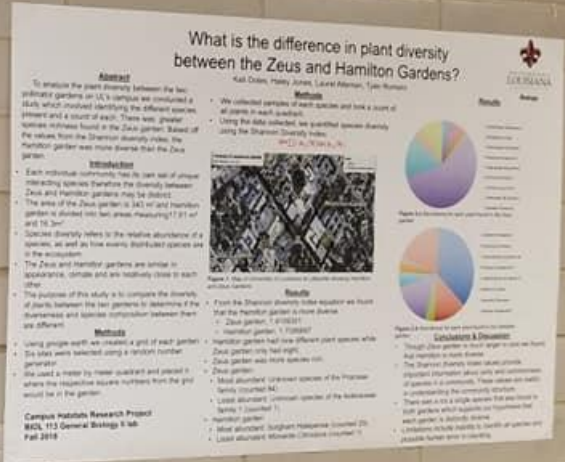
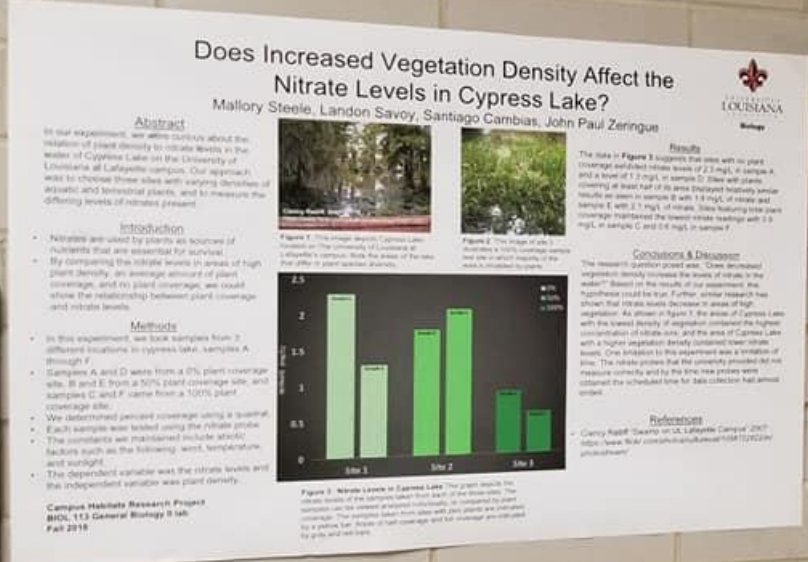
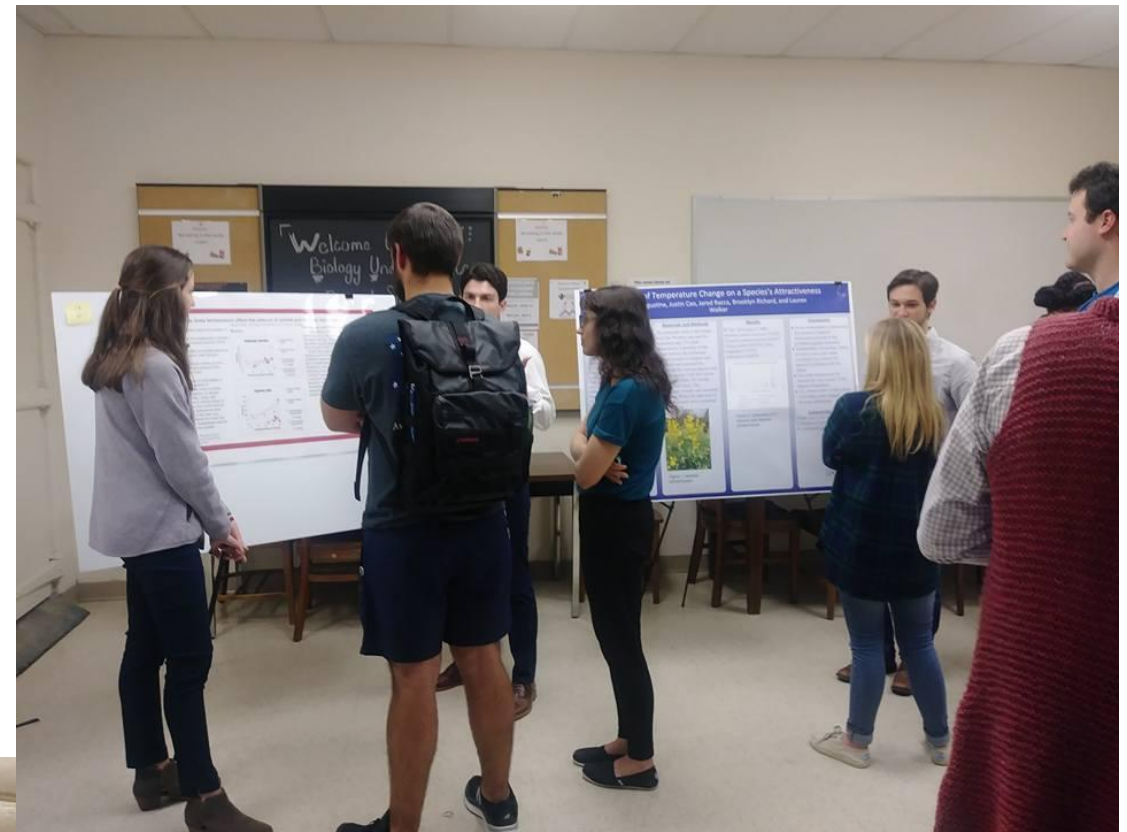
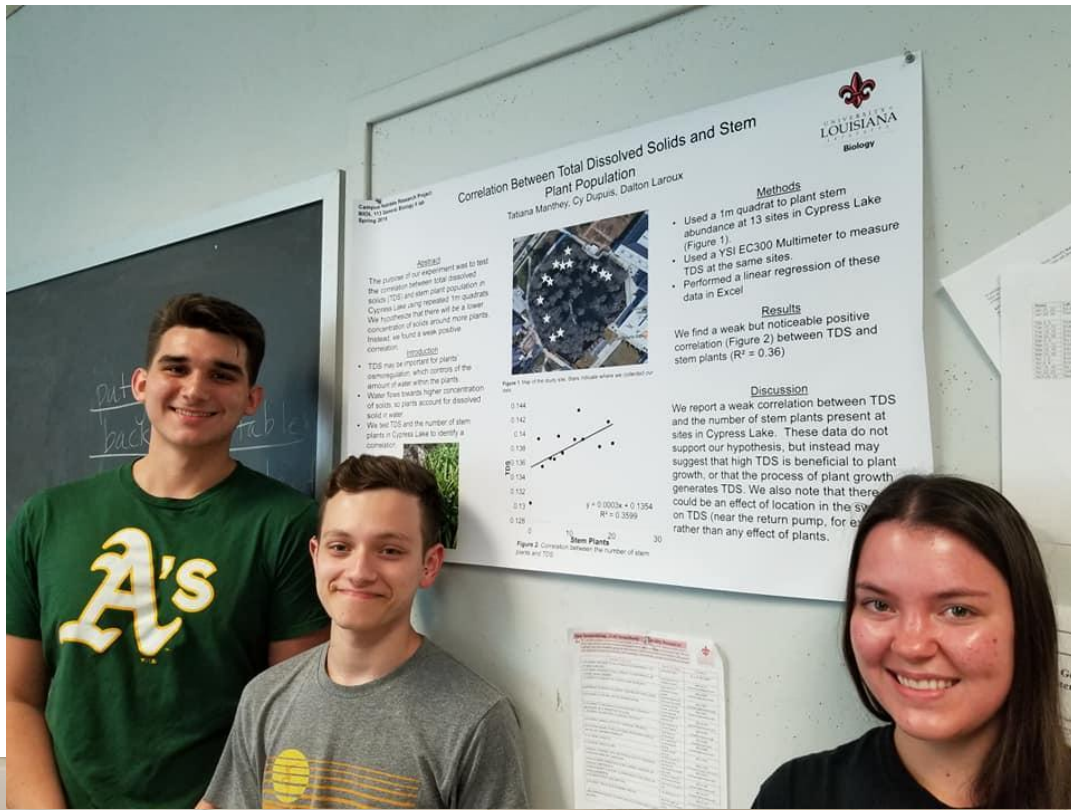
- Research is **embedded into the course** curriculum
- **All** students engage in the research project
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An example of a CURE

Race and Ethnic Relations examines the evolving nature of America's social and cultural diversity and the issues of racial prejudice, hatred, and discrimination in the country. Students complete the final paper based on research on the relationship between race and incarceration. The research utilizes arrest data from the Bureau of Justice Statistics website. Students derive the research questions and corresponding hypotheses based on their review of literature.

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BIOL 113 lab: Campus Habitats

Posters presented in class

Class favorites go to the hall

TAs invite some to present at BURS

An example: [A Microbiology CURE in Freshman Biology at LSU](#)

What have you already done that comes closest to being a CURE?

Turn to your neighbor

2. Design and evaluate CUREs appropriate for a course you'll teach this semester.

Let's get started

Check catalog.louisiana.edu to see if your course description could accommodate a CURE.

This is bigger than UL

Academic/professional societies: Does yours have a position statement like [American Society for Microbiology](#)'s?

Models for CUREs in Biology

- Extensions of a faculty research lab, TA is grad student (e.g. LSU)
- National network model (e.g., [SEA-PHAGES](#))
- Longitudinal local project (e.g., [Campus Habitats](#) in BIOL 113)

K-12

Louisiana has adopted Next Generation Science Standards for K-12

One of 3 dimensions focuses on research practices

Scientific and Engineering Practices		Crosscutting Concepts	
<ol style="list-style-type: none"> 1. Asking Questions and Defining Problems 2. Developing and Using Models 3. Planning and Carrying Out Investigations 4. Analyzing and Interpreting Data 5. Using Mathematics and Computational Thinking 6. Constructing Explanations and Designing Solutions 7. Engaging in Argument from Evidence 8. Obtaining, Evaluating, and Communicating Information 		<ol style="list-style-type: none"> 1. Patterns 2. Cause and Effect 3. Scale, Proportion, and Quantity 4. Systems and System Models 5. Energy and Matter 6. Structure and Function 7. Stability and Change 8. Interdependence of Science, Engineering, and Technology 9. Influence of Engineering, Technology, and Science on Society and the Natural World 	
Disciplinary Core Ideas			
<i>Physical Sciences</i>	<i>Life Sciences</i>	<i>Earth and Space Sciences</i>	<i>Engineering, Technology, and the Applications of Science</i>
<p>PS 1: Matter and its interactions</p> <p>PS 2: Motion and stability: Forces and interactions</p> <p>PS 3: Energy</p> <p>PS 4: Waves and their applications in technologies for information transfer</p>	<p>LS 1: From molecules to organisms: Structures and processes</p> <p>LS 2: Ecosystems: Interactions, energy, and dynamics</p> <p>LS 3: Heredity: Inheritance and variation of traits</p> <p>LS 4: Biological evolution: Unity and diversity</p>	<p>ESS 1: Earth's place in the universe</p> <p>ESS 2: Earth's systems</p> <p>ESS 3: Earth and human activity</p>	<p>ETS 1: Engineering design</p> <p>ETS 2: Links among engineering, technology, science, and society</p>

Instructional design begins with the end in mind:

1. Write the Learning Objectives first
2. Draft the grading rubric
3. Plan public presentation
4. Backward design from there: add milestones and schedule

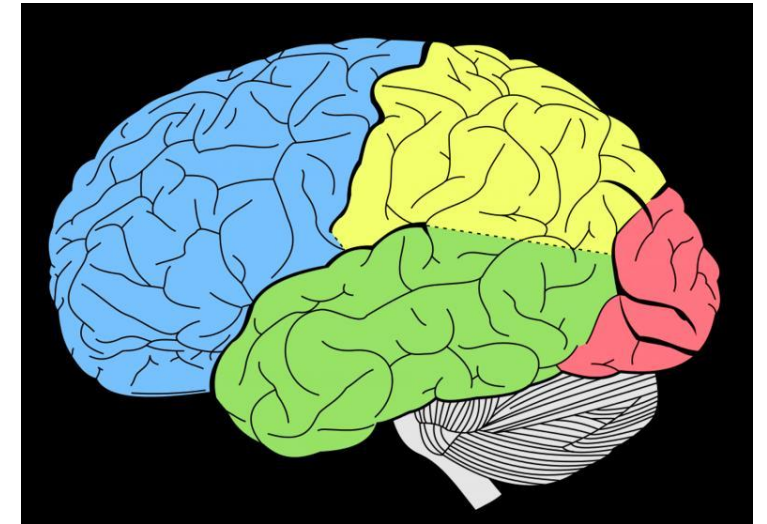
[Campus Habitats](#) Guidelines

What will be memorable or appealing about your CURE?

Make your CURE work with young brains, not against.

Approaches that appeal to diverse frontal lobes of 18–20-year-olds

- Clarifying their identity
- Empowerment to take action to make the world better
- Freedom, independence, choices, creativity
- A mystery or riddle
- Debates, Being right
- Gamification: clear goals with rewards
- Virtual communities
- Friendly competition
- Familiar, local



It doesn't have to be something they're "interested in". Curiosity comes later.

Let's get to work

- Think, sketch, draft alone (5 min)
- Talk to your neighbor
- Refine plan
- Make an infographic that communicates your plan

Title

Timeline? How long? Milestones?

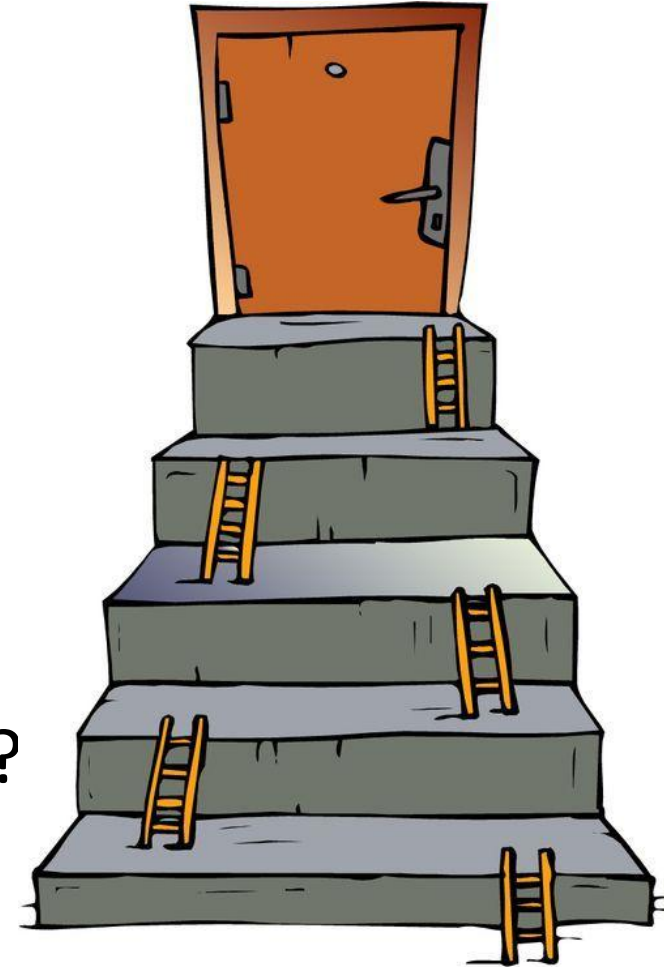
What will product be? What public event?

Which research methodologies?

What can students collaborate on?

What should be done in class, and what virtually?

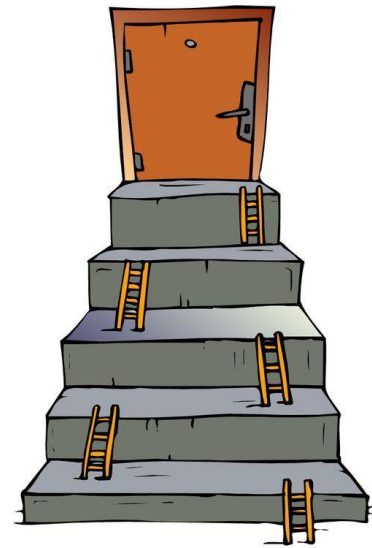
What content will you have to give up?



What will go into syllabus Monday? As little as possible.

If you're not ready for a CURE, at least **scaffold** with research-rich experiences

- Choose scholarly work from colleague, then invite them to class
- Present a question and let them discuss how to approach answering it
- Talk about researchers as though they are real people
- Report news that isn't in textbooks yet
- Assign attending research talks or creative exhibits and performances
- Invite them to help crunch data or process samples
- Encourage and expect students to speak in class
- Don't assume they need to understand everything about the research to get something from it



If you're not ready for a CURE, at least **scaffold** with research-rich experiences

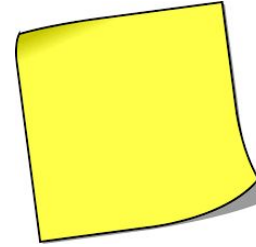
- Focus on the research examples in textbooks
 - Have them sketch procedure from written description
 - Imagine data collection using nicknames of researchers
- Offer flexible alternatives to traditional assignments
 - Attend and report on departmental seminar, connect to class
 - Book clubs
 - Journal club that reads a colleague's paper. Invite or visit in their lab/office
 - Online discussion about recent news about research in your discipline
 - Write to an elected official about time-sensitive action
 - Offer question options on exams that let them revisit/retell these experiences



Revisions to your infographic?

CUREing your class

- Gallery Walk to visit infographics
- Explain your idea to visitors
- Visitors jot comments, stick on infographic
- Include a naysayer comment



2. Design and evaluate CUREs (or research-rich experiences) appropriate for a course you'll teach this semester.

3. Propose several actions you can take this semester to sustain and continuously improve CUREs.

It's going to get weedy and bumpy. What will get you to December invigorated, not limping?

Only commit in syllabus to what you know you can do well.

Decide when you need to finalize plan and checkpoints to get there.

Lean on your tribe. Visit each other's classes and visit over coffee.

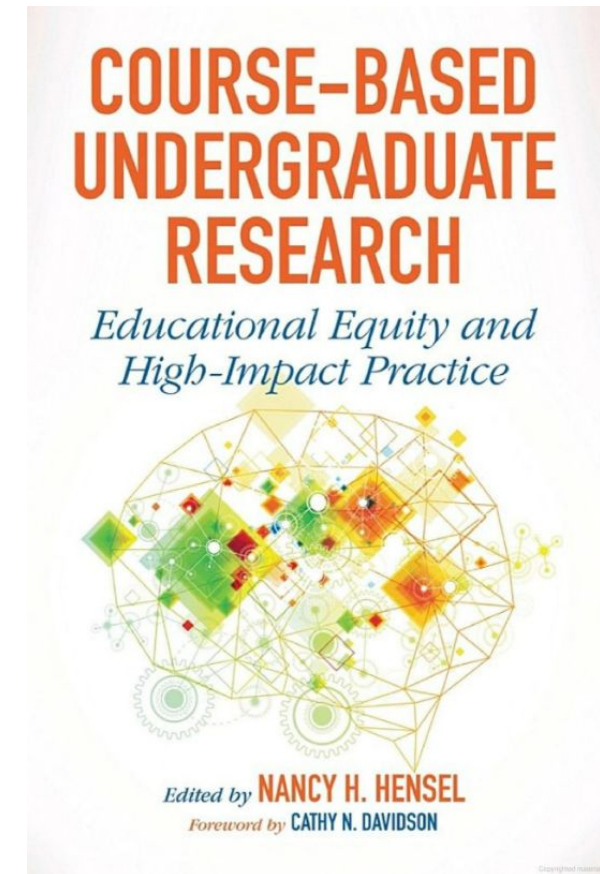
Sanity habit: Mark reminders about above on your calendar.

Teaching is part of your job as an academic.

- Document and share what you did.
 - Offer to co-present at a lunch-and-learn
 - Put it in your annual performance report
 - If you do a thoughtful evaluation, submit it to Advance, LaCOEUR, [CUREnet](#), disciplinary education journals (SoTL)
- Professional development: learn about learning

Challenges of Course-Based Research

Implementing course-based research is not easy. There are logistical and attitudinal challenges in developing a successful course-based research program. Brownell and Tanner (2012) suggest that, in addition to lack of training, time, and incentives as barriers to pedagogical change, a scientist's professional identity as a researcher rather than as a teacher might be a hidden barrier. Reframing the concept of undergraduate research from the apprentice model to a concept that includes working with a whole class and seeing the acquisition of research skills as a developmental process is needed for course-based research. Adapting authentic research to the developmental needs of first-year students is a demanding endeavor. Course-based research requires significant planning time and knowledge about how students learn. It is essential to identify a project that is appropriate for the developmental level of first- and second-year students and introduces students to the research methodology of professionals in the field. Resource issues must also be considered in course-based research. Successfully replicable course-based science projects use materials that are inexpensive, readily available, and straightforward to train students to use. Social science research must be scalable in terms of numbers of subjects and complexity of the statistical design. Humanities research projects must have access to appropriate archives and other resources.



Myths about Research	It may help to know that
Knowledge and skills are prerequisites for participation	Knowledge and skills are best learned when they are needed (in context, meaningful)
Curiosity is innate	Curiosity is a consequence
Research is conducted to generate facts	Research is conducted to answer a question.
Research has a “method” of steps	Research is systematic collection of evidence analyzed to make a claim.
Intelligence is a reliable predictor of who will be successful in research	Patience, persistence/grit, tolerance for ambiguity matter. Research is often done in teams with diverse skills and traits.
Emotion is irrelevant or undesirable	Emotion is a guide that propels or hinders success.

Myths about Learning	It may help to know that
Learning requires studying	Learning happens everywhere, most impactful if meaningful and intentional
If you forgot it, you didn't learn it	Learning is a change in one's experience of the world. What has meaning and how one responds to the world is what one has learned.
Teaching is telling	Teaching is designing experiences that make meaningful learning more likely to happen
A student who is not happy or successful is probably not cut out for that major.	Emotions are information. "Not cut out" conveys a fixed mindset.
Students know if they've learned. They learn more if they enjoyed it.	The lecture (edutainment) effect feels like learning happened.

Measuring actual learning versus feeling of learning in response to being actively engaged in the classroom

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We compared students' self-reported perception of learning with their actual learning under controlled conditions in large-enrollment introductory college physics courses taught using 1) active instruction (following best practices in the discipline) and 2) passive instruction (lectures by experienced and highly rated instructors). Both groups received identical class content and hand-outs, students were randomly assigned, and the instructor made no effort to persuade students of the benefit of either method. **Students in active classrooms learned more** (as would be expected based on prior research), but their perception of learning, while positive, was lower than that of their peers in passive environments. **This suggests that attempts to evaluate instruction based on students' perceptions of learning could inadvertently promote inferior (passive) pedagogical methods.** For instance, a superstar lecturer could create such a positive feeling of learning that students would choose those lectures over active learning. Most importantly, these results suggest that **when students experience the increased cognitive effort associated with active learning, they initially take that effort to signify poorer learning.** That disconnect may have a detrimental effect on students' motivation, engagement, and ability to self-regulate their own learning. Although students can, on their own, discover the increased value of being actively engaged during a semester-long course, their learning may be impaired during the initial part of the course. We discuss strategies that instructors can use, early in the semester, to improve students' response to being actively engaged in the classroom.

Turn to your neighbor.

3. Propose several actions you can take this semester to sustain and continuously improve CUREs.

CUREing your own Classes

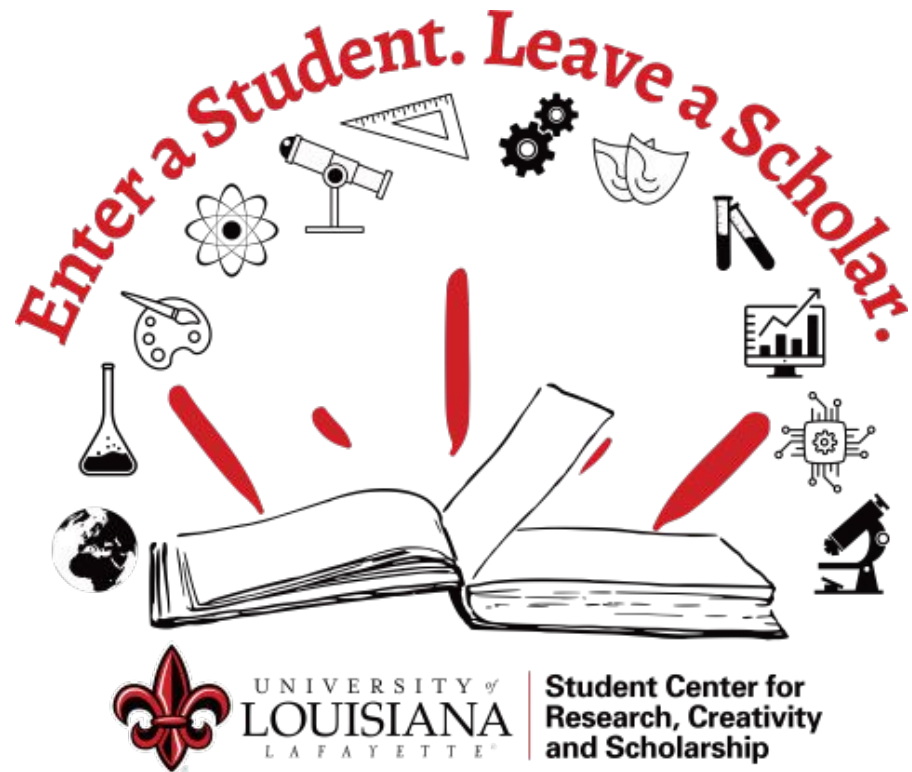
develop specific plans ready to add to your fall syllabi

Objectives: By the end of this workshop and throughout the semester, faculty participants can:

1. Explain to a colleague **what CUREs are** and give an example.
2. **Design** and evaluate a CURE appropriate for a course you'll teach this semester.
3. Propose several actions you can take this semester to **sustain** and continuously improve CUREs.

Goal: that you leave today feeling motivated, informed and supported to make a difference in the quality of undergraduate education at UL this semester.





The CURE for Research Participation

Participants will explore, collaborate, and design sustainable research experiences appropriate for their undergraduate courses.

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