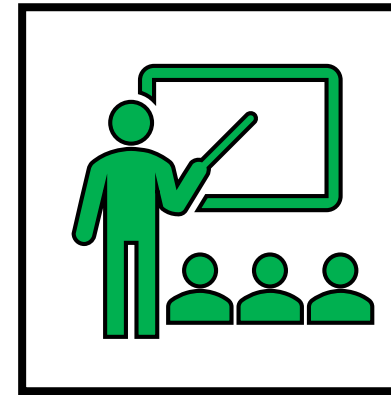
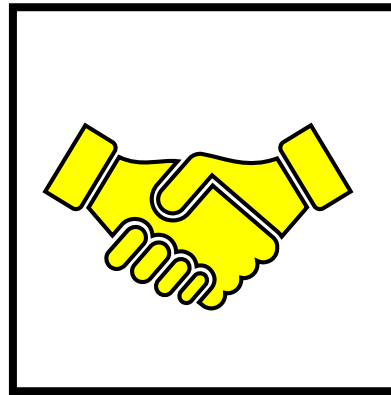


# INTEGRATING EDUCATION, OUTREACH, AND UNDERGRADUATE RESEARCH INTO RESEARCH PROPOSALS



**Matthew J. Bandelt Ph.D. P.E.**

**J.A. Reif, Jr., Department of Civil and Environmental Engineering  
New Jersey Institute of Technology**



ACI Convention – Spring 2024  
Best Practices for Incorporating Research into Concrete Education  
New Orleans, Louisiana  
25 March 2024

# OUTLINE

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Perspectives on proposal writing



Outreach reach activities with meaningful impact



Embedding research content in curriculum

# THE PROPOSAL CHECKLIST



- Develop a new course or module on topic related to the proposal
- Integrate undergraduate students in research activities
- Foster outreach to K-12 students to promote interest in STEM and concrete education

# THE PROPOSAL CHECKLIST

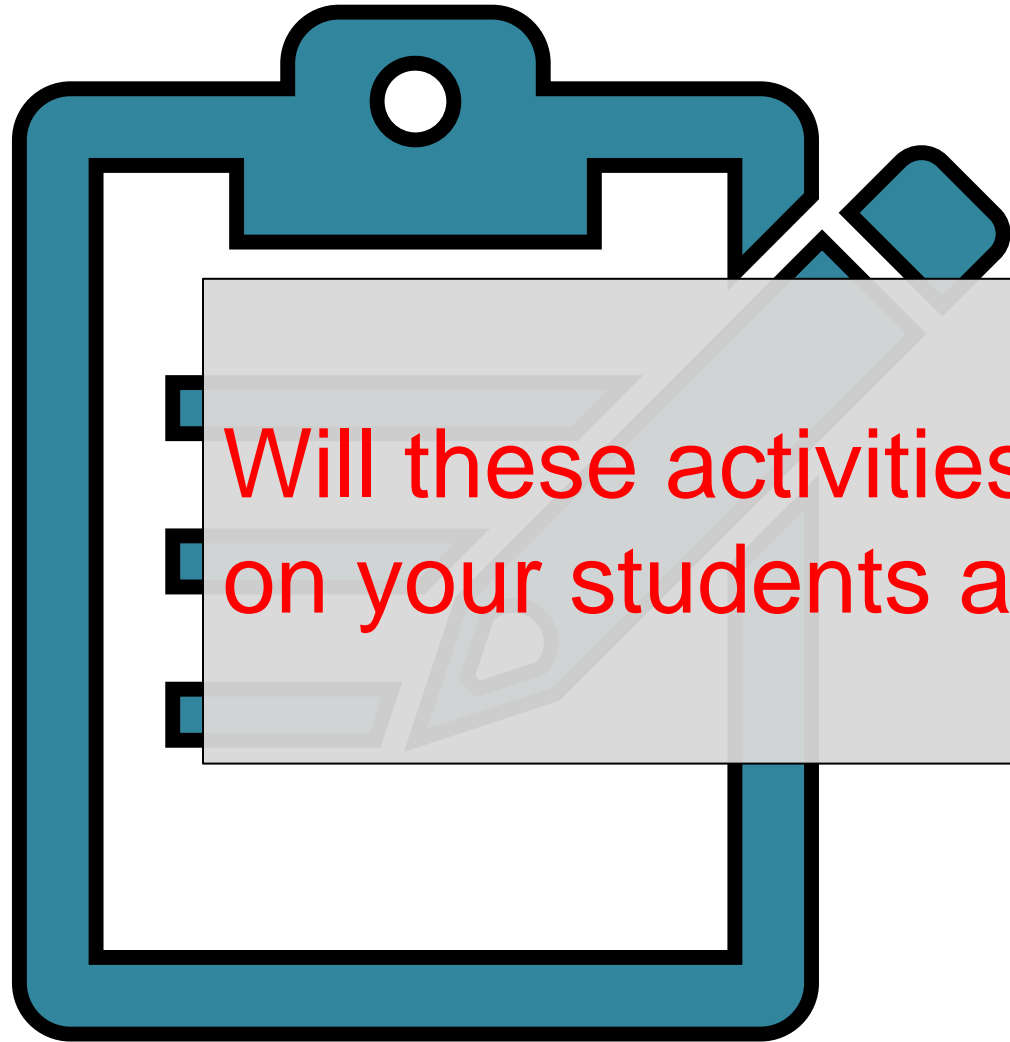


- Develop a new course or module on topic related to the proposal

Are these activities **meaningful** to you and your lived experiences?

- Foster outreach to K-12 students to promote interest in STEM and concrete education

# THE PROPOSAL CHECKLIST



- Develop a new course or module on topic related to the proposal

Will these activities have **measurable impact** on your students and educational programs?

- Foster outreach to K-12 students to promote interest in STEM and concrete education

# THE PROPOSAL CHECKLIST



- Develop a new course or module on topic related to the proposal

Are your efforts **accomplishable** and of reasonable scale?

- Integrate undergraduate students in research activities
- Foster outreach to K-12 students to promote interest in STEM and concrete education

# OUTLINE

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Perspectives on proposal writing

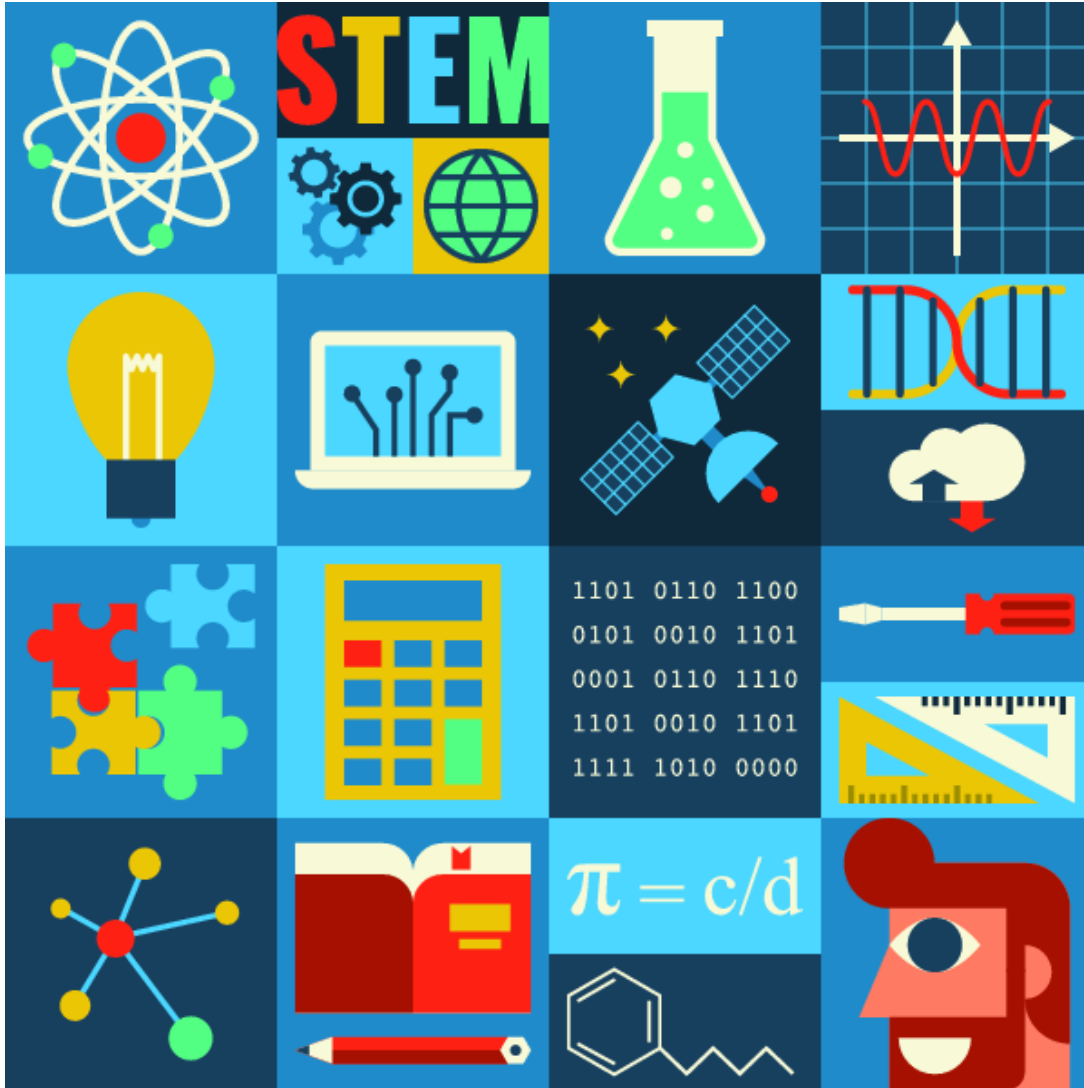


**Outreach reach activities with meaningful impact**



Embedding research content in curriculum

# OUTREACH



- What experiences in your life motivated you?
- How does your institution interact with the local, regional or national community?
- What is appropriate for the scale of the project and the group you're interacting with?



# CONNECTING LIVED EXPERIENCES WITH OPPORTUNITY



FOLLOW US:     
GET THE UPSHOT IN YOUR INBOX

 SHARE

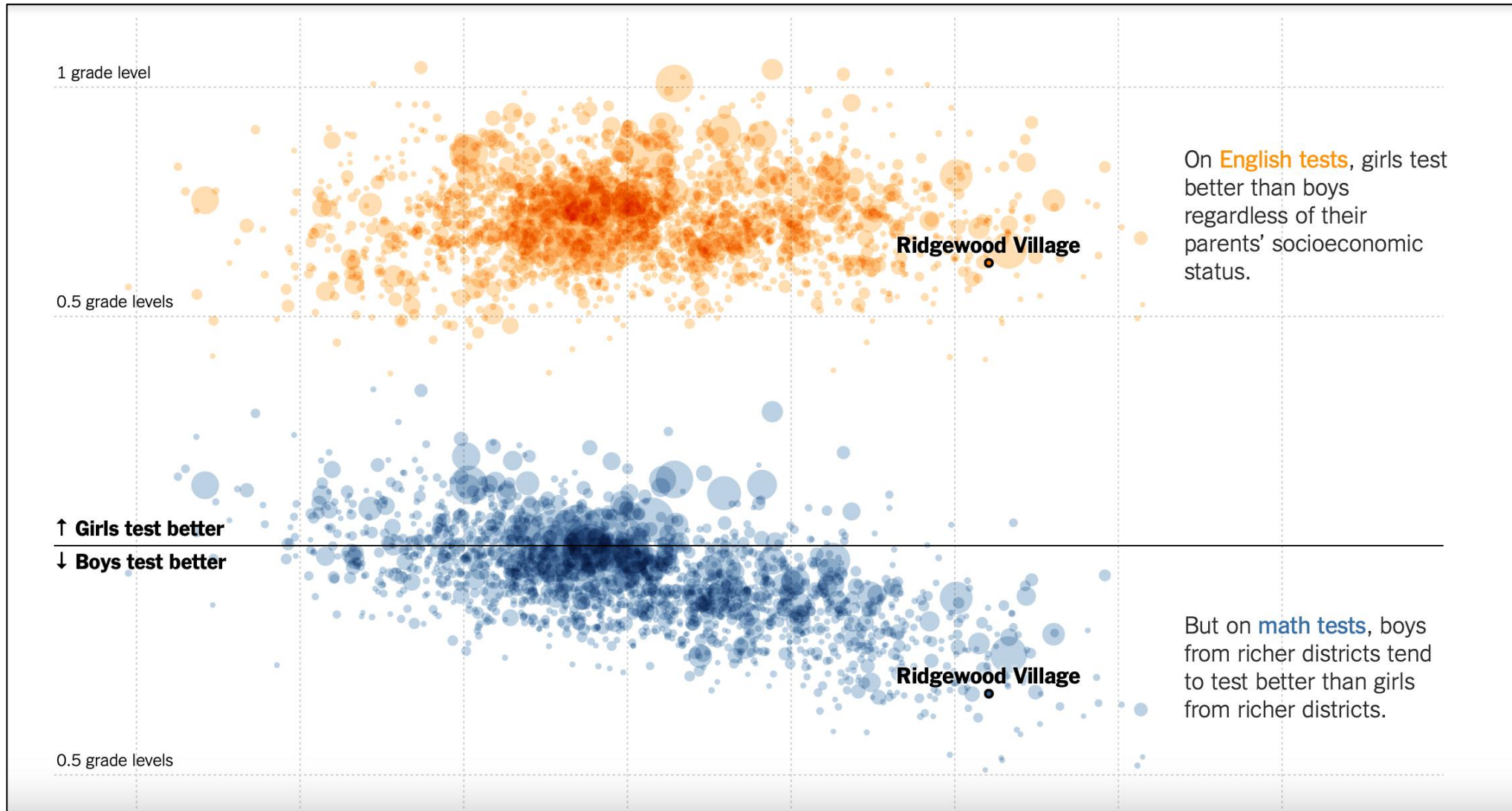
## *Where Boys Outperform Girls in Math: Rich, White and Suburban Districts*

By CLAIRE CAIN MILLER and KEVIN QUEALY JUNE 13, 2018

In much of the country, the stereotype that boys do better than girls at math isn't true – on average, they perform about the same, at least through eighth grade. But there's a notable exception.

In school districts that are mostly rich, white and suburban, boys are much more likely to outperform girls in math, according to [a new study](#) from Stanford researchers, one of the most comprehensive looks at the gender gap in test scores at the school district level.

# CONNECTING LIVED EXPERIENCES WITH OPPORTUNITY



# CONNECTING LIVED EXPERIENCES WITH OPPORTUNITY



How can I use this funding to have an impact on my personal community?



# OUTREACH



Develop appropriate exercises to build excitement in concrete, construction, and engineering

# OUTREACH



NEW YORK CITY

## Newark Ranks 3rd, NYC Ranks 39th on Neediest Cities in the Country: Study

The study also found that



# OUTLINE

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Perspectives on proposal writing

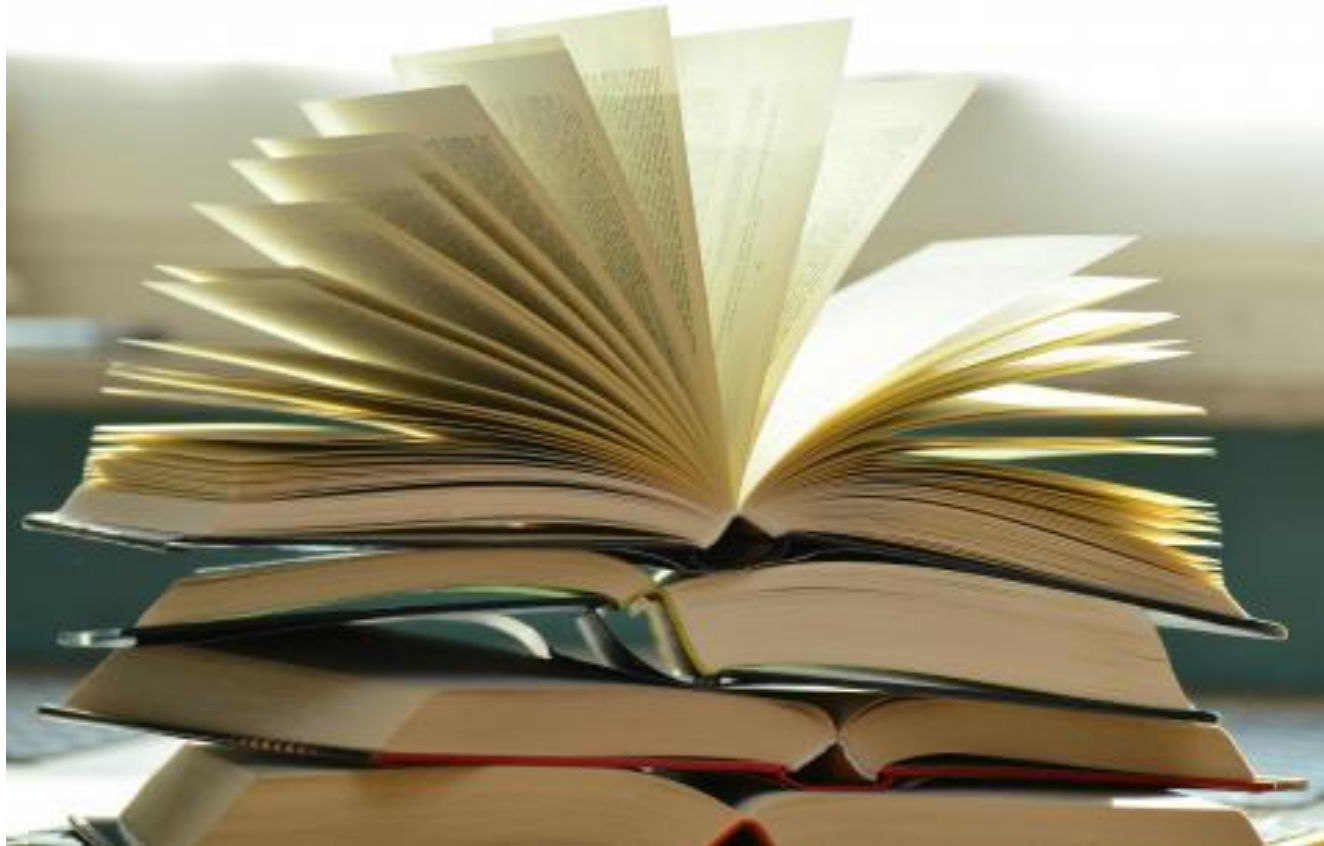


Outreach reach activities with meaningful impact



**Embedding research content in curriculum**

# CURRICULUM DEVELOPMENT

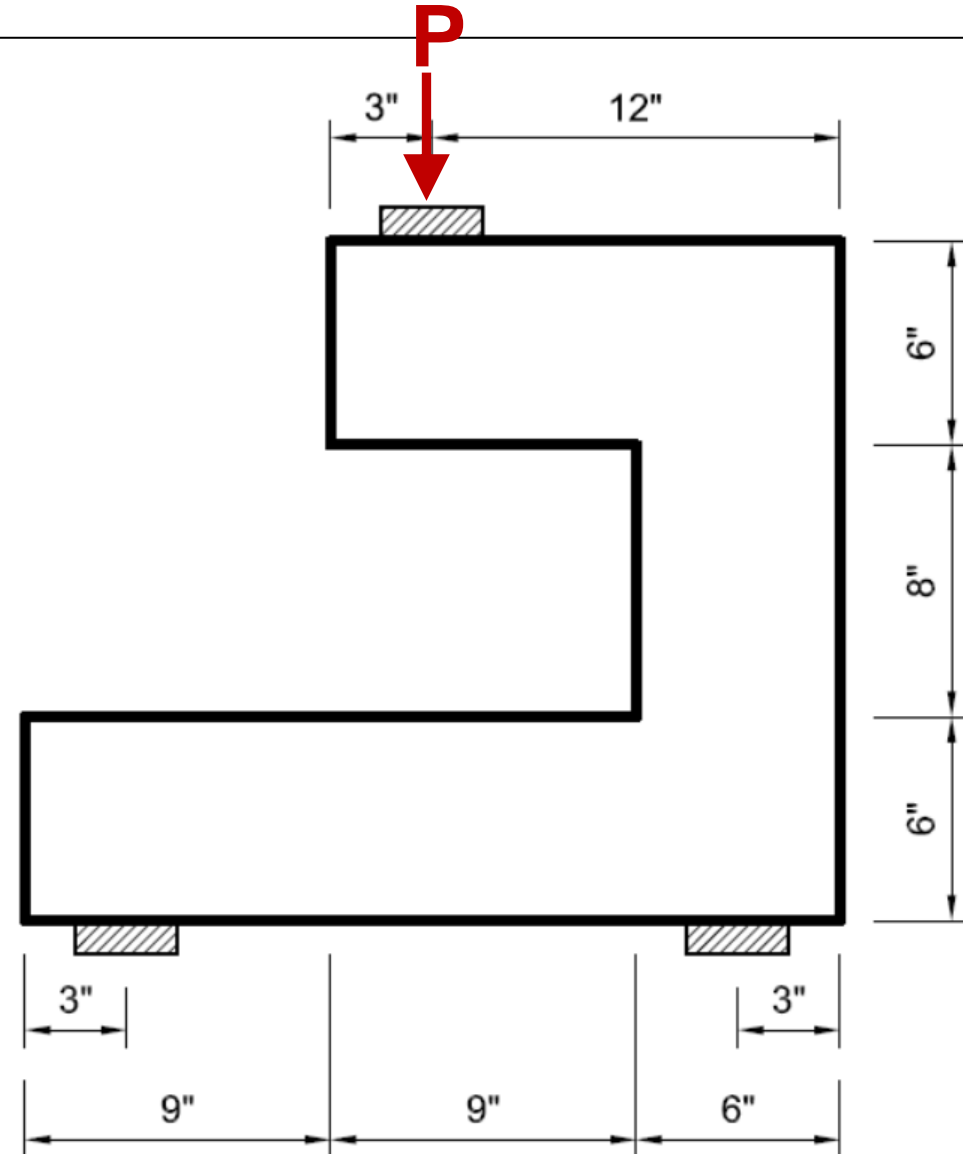


- What might work in your academic programs?
- Can you embed topics or is there a need for a new course?

# LABORATORY COURSE EXAMPLE

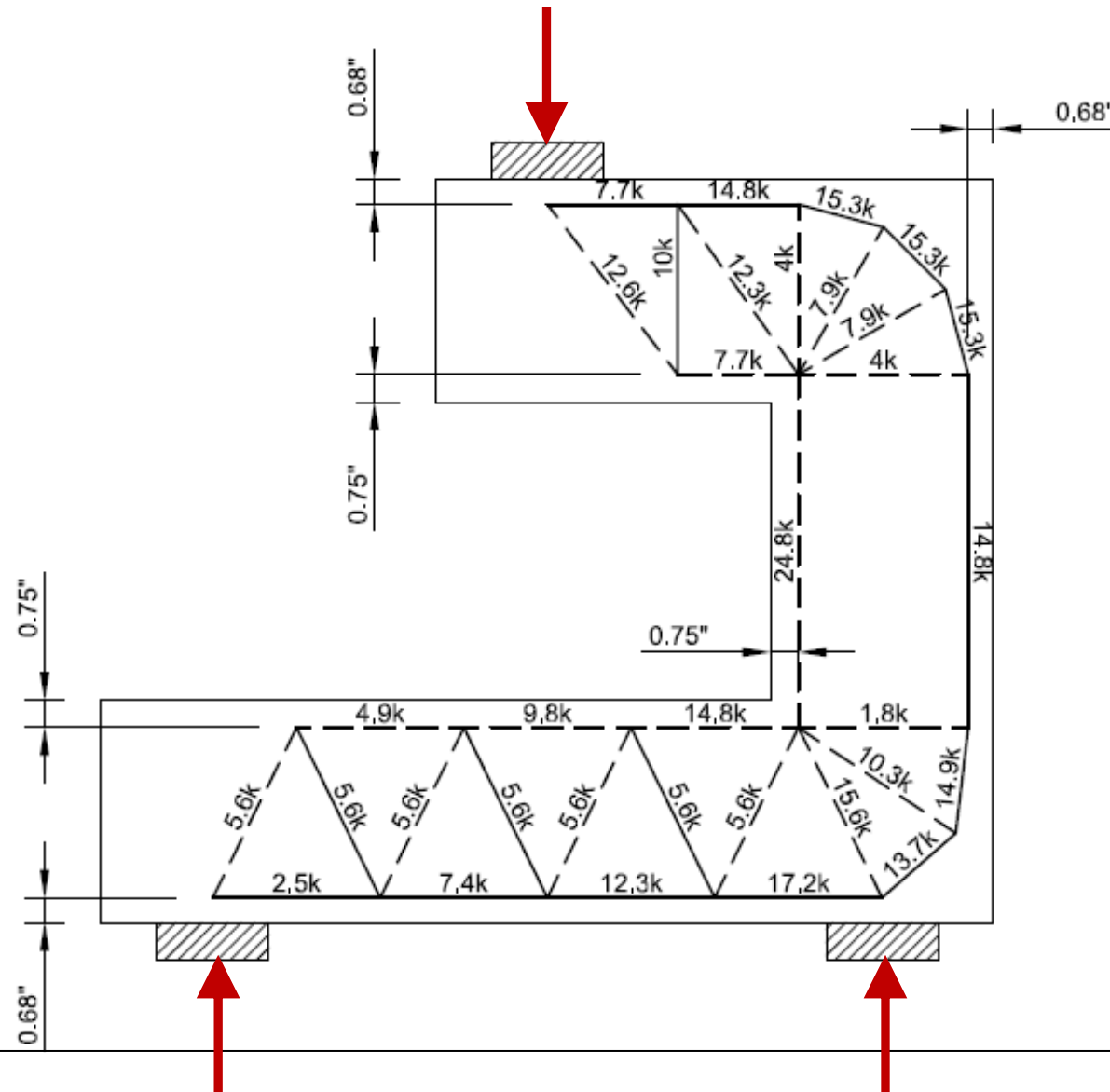
## Design constraints

- Use strut and tie method
- Must be able to withstand  $P = 10k$
- $f_c = 4 \text{ ksi}$
- Access to #4 bars and 1/8" high strength wire

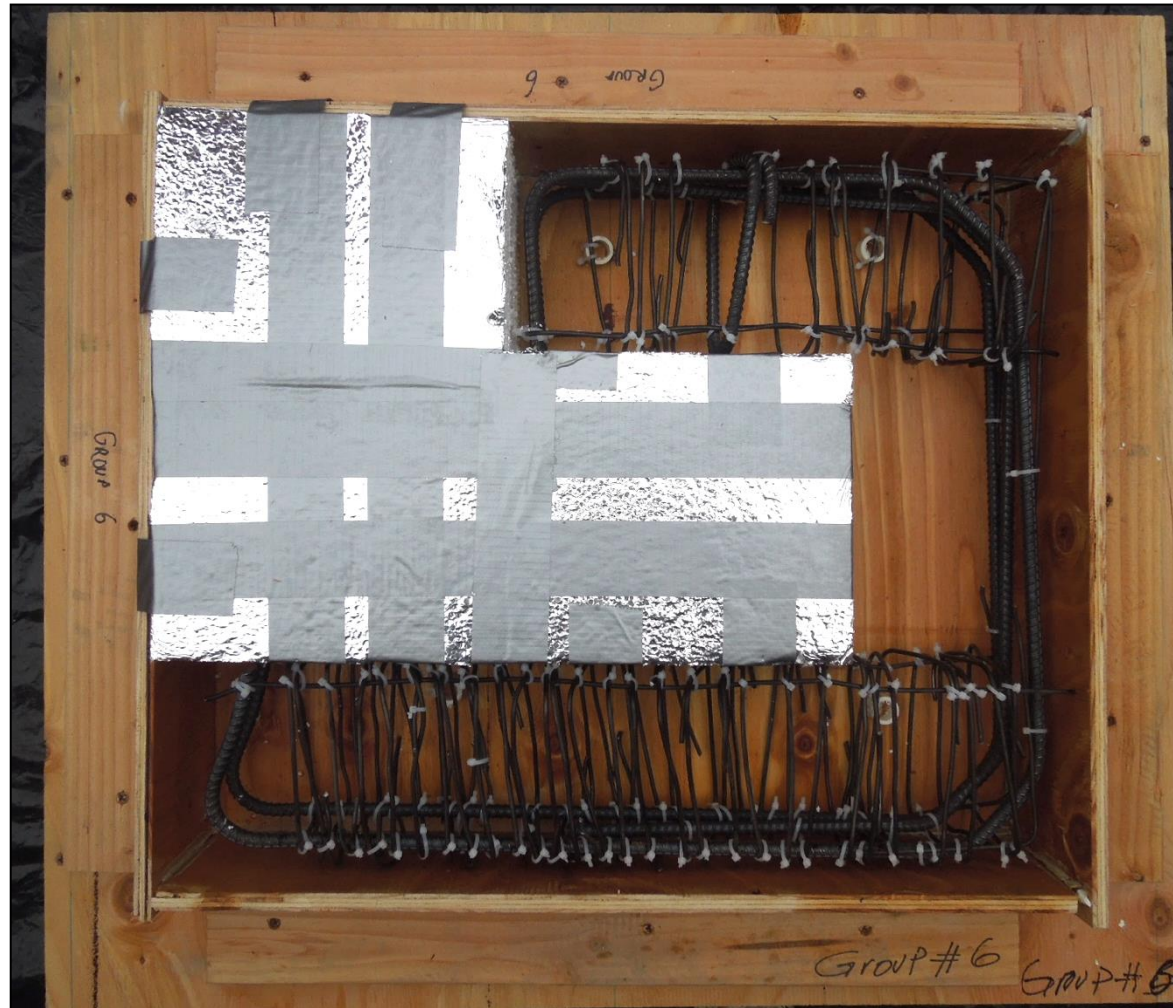




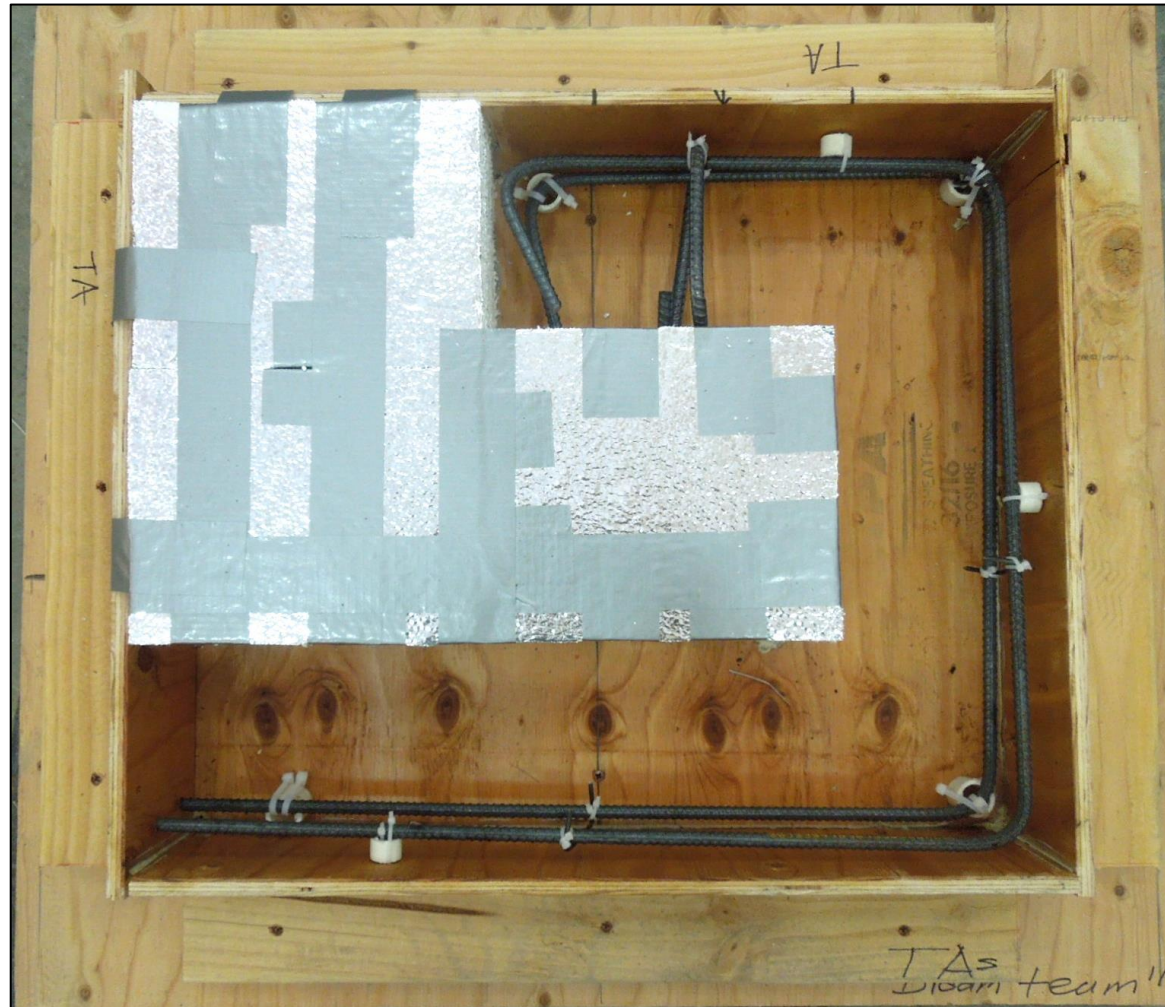
# REPRESENTATIVE STUDENT STRUT AND TIE MODEL



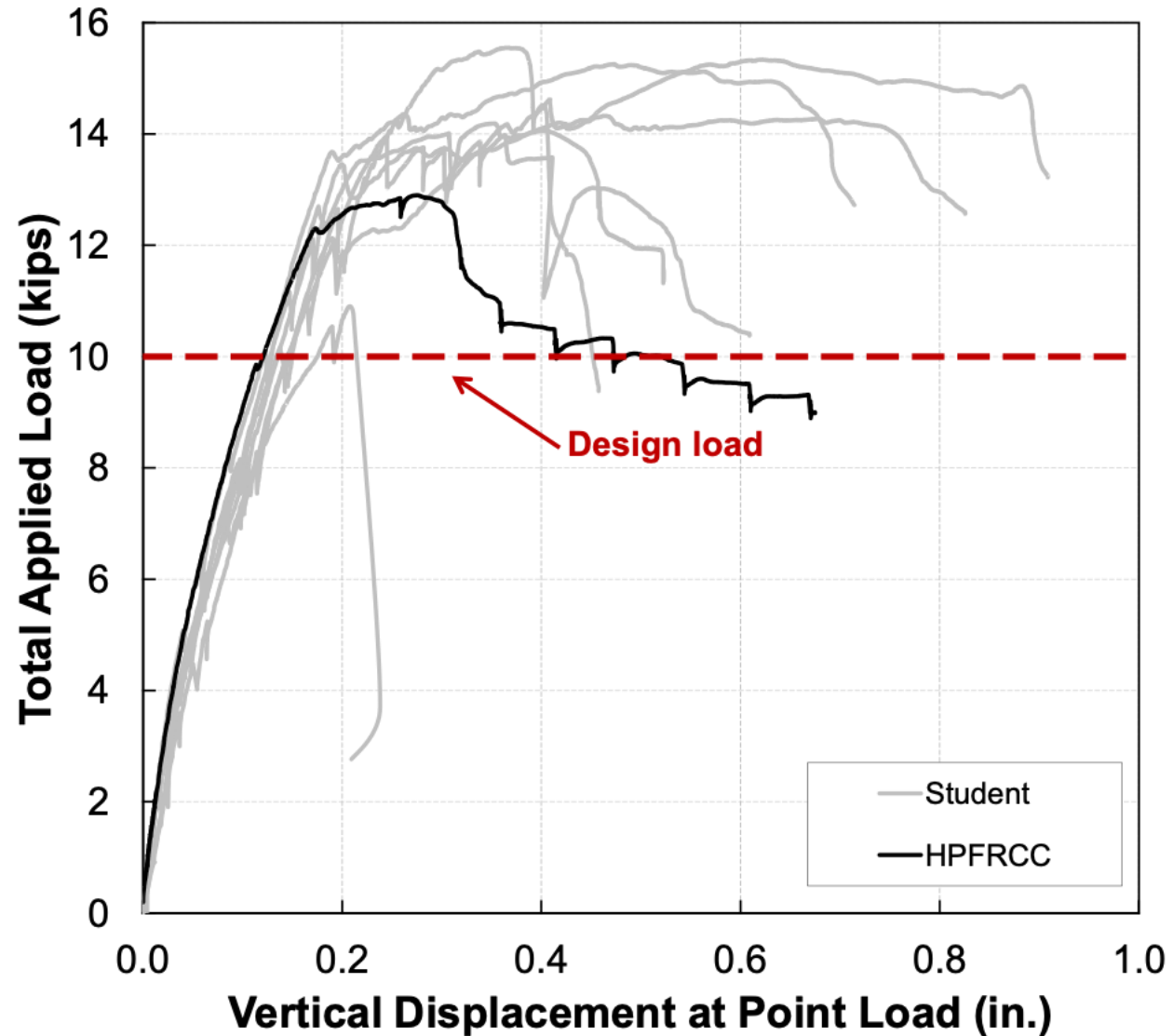
# REPRESENTATIVE STUDENT REBAR LAYOUT



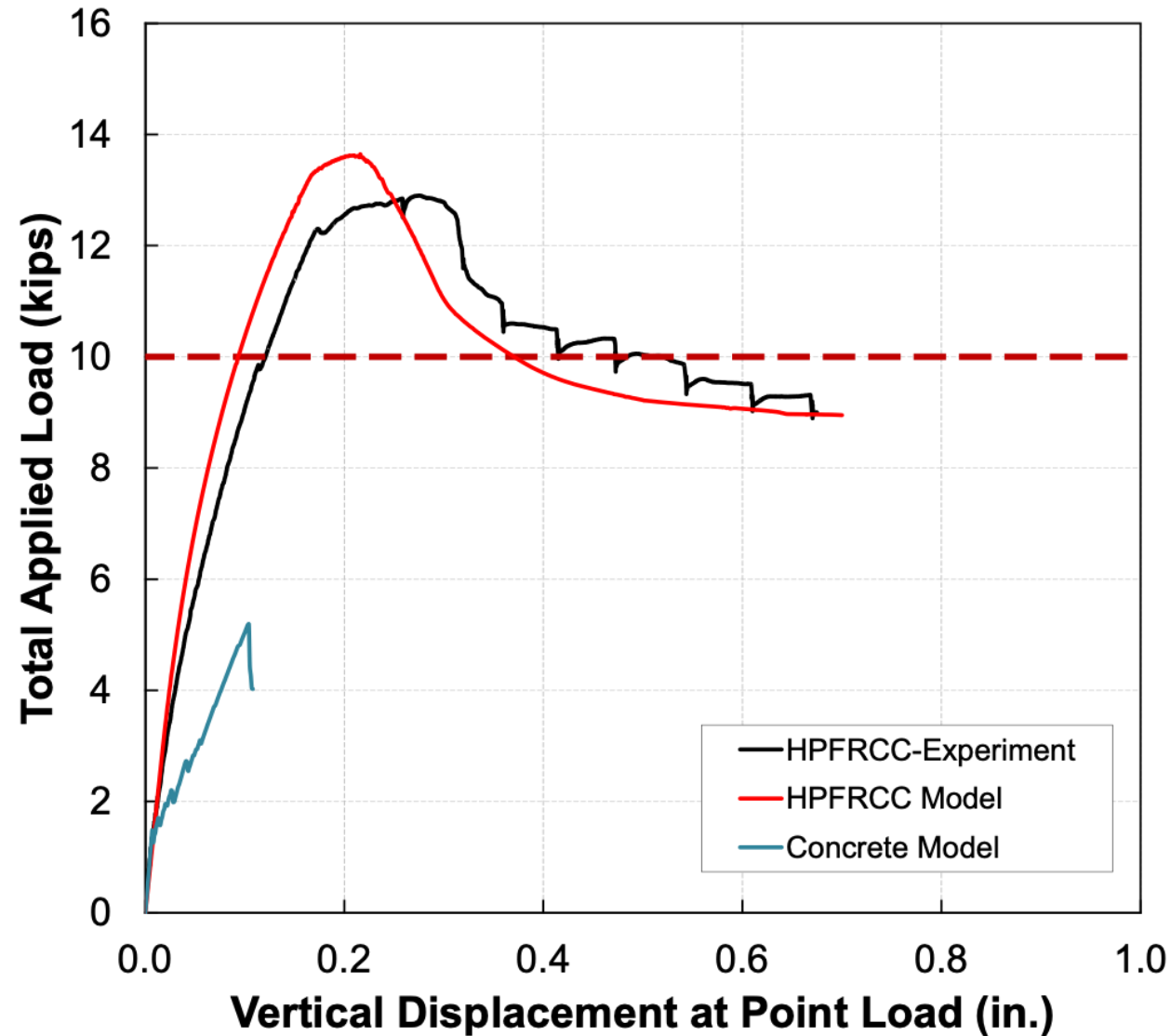
# REBAR LAYOUT FOR HPFRC



# EXPERIMENTAL STRUCTURAL RESPONSE



# COMPUTATIONAL STRUCTURAL RESPONSE



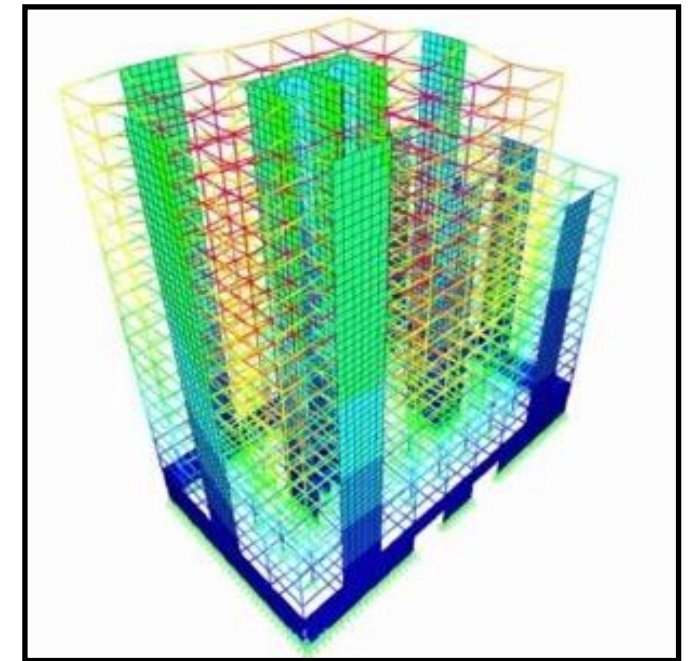
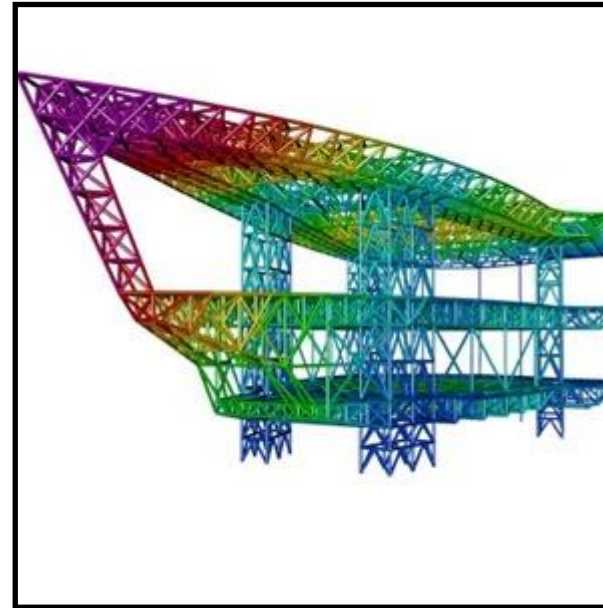
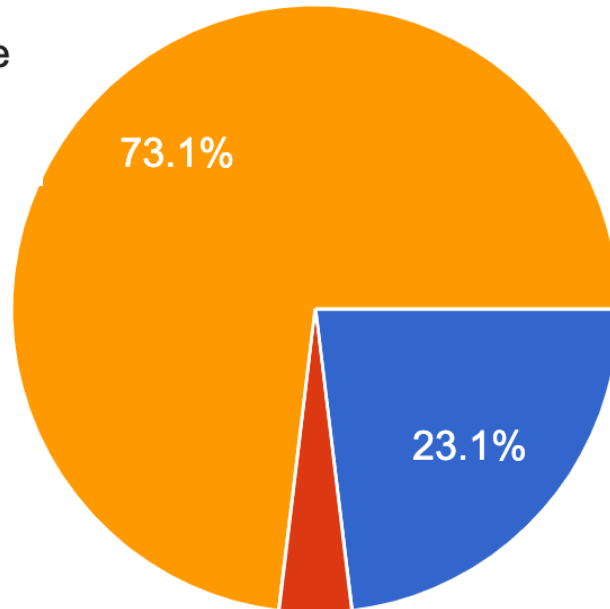


# BUILDING CONTENT FOR YOUR STUDENTS

What is your employment status?

52 responses

- Unemployed
- Employed part time
- Employed full time



# SUMMARY

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- Avoid trying to meet a checklist when preparing a proposal
- Be authentic in your proposed activities that will have meaningful impact to you and your community
- Develop content that's appropriate for your academic programs





**THANK YOU!**  
**bandelt@njit.edu**



## **Acknowledgements**

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