JACOBS SOLUTIONEERING CHALLENGE

Regional – There is no advancement to a Society-wide national competition for this competition.

Overview

Jacobs Engineering Group is dedicated to challenging today to reinvent tomorrow by solving the world's most critical problems for thriving cities, resilient environments, mission-critical outcomes, operation advancement, scientific discovery, and cutting-edge manufacturing, by turning abstract ideas into realities that transform the world for good.

Whether you are a civil engineer, structural engineer, architect, or mechanical engineer, we all can be a solutioneer! Jacob's defines a solutioneer as:

"A visionary who transforms challenges into opportunities to make a smarter, more connected, and sustainable world."

Through collaboration amongst all engineering disciplines, we can brainstorm, develop, and deliver our innovative solutions into reality.

Objective

The Solutioneering Challenge is a competition designed to inspire and engage students from colleges and universities in the development of time-sensitive solutions while considering the impact in the future. Most projects have definitive timelines to prepare, design, and deliver a successful result. However, with the rapidly changing climate, and natural disasters becoming seemingly more frequent, communities don't have all the time they need to come up with the solutions for tomorrow. Time restrictions only add more challenges. The objective of this competition is to place a team of solutioneers in a stressful, time-sensitive scenario challenging their thought process as they aim to provide a solution for the challenges of today to reinvent tomorrow.

Setting the Scene

The stage is set with the fictitious city of Tropical Ridge, a city located on the west coast of Florida. Tropical Ridge has not invested in any new infrastructure in the last 5 years. As a result of the poor planning, the city is very susceptible to massive flooding, power outages, and slow response times for essential services. An unfortunate, massive storm would most certainly wreak havoc and destruction that the city has not seen in decades.

News has just broken where scientists have tracked, with almost 90% certainty, a potential Category 4 hurricane. Tropical Ridge is directly in the path of the hurricane's eye. Your team has been dispatched by the city governance to prepare a disaster relief plan and mitigation strategy. You only have a few days before the hurricane is set to make land fall. Time is of the essence and a plan must be formed.

Competition Format

Forming a team of up to 5 individuals, your team will be tasked with providing a disaster relief and future mitigation plan to the city. Over the course of a two (2) hour window, teams will need to draw out a schematic of their disaster relief plan along with a 1 to 2 page report detailing their schematic and explain their decision process.

Students will be asked to accommodate the current situation of the Coastal Spring's infrastructure and implement innovative solutions to help prepare the city for the imminent hurricane while also preparing the city for future mitigation efforts. There will be two (2) portions: the drawing and the report. The drawing portion will include a detailed sketch overlayed on the layout of Tropical Ridge demonstrating a disaster relief plan and a future plan to make Tropical Ridge more resilient. The report will include a summarized explanation of the decision process and reasoning behind the selected design from the drawing portion.

Day of the Competition

Teams will be asked to meet in a designated room (Time and Location TBD). At the start of the competition, each team will be given three (3) engineering sheets, 24" x 36", showing a scaled layout of Tropical Ridge: (1) will be the working sheet, (1) will be used for final presentation of the proposed assessment, and (1) will be used for the final presentation of the proposed future remediation efforts. All three will be submitted to show the progression of the team's work and collaboration.

Students will be given flood maps that follow the same layout of the city. The flood maps will show the probable flood heights, Flood Height and associated risk percentage, Flood Risk Map for the various areas of the Tropical Ridge. Reviewing and understanding these two types of flood maps is strongly recommended prior to the competition.

In addition to everything above, students will be given a table showing the flood plains corresponding to their respective expected

return period, i.e. 10 year, 25 year , 50 year, 100 year, and 250 year. These will serve as the basis for your decisions and suggestions to the city for future remediation efforts. The design category chosen for the future efforts and the report will be up to the team. Choose wisely.

Rules

1. Team Formation: Participants form teams consisting of undergraduate and/ or graduate students from their respective university. Teams are encouraged to include members with diverse backgrounds, such as engineering, environmental science, meteorology, and other relevant disciplines.
   There is a maximum of 5 members per team.

2. Research and Development: Teams have several months to develop and refine their knowledge of various hurricane mitigation systems, disaster resilience practices, and actual real-life examples in local cities and regions.

   Students are encouraged to conduct research, gather data, and educate themselves on the technology currently at their disposal to support their designs.
   Use any resources available like the ones on the ASCE website, FEMA, and USACE's Engineering with Nature Volume 2.

3. Technology: While a personal computer is required during the competition to write the report, teams will not be able to search the internet to develop their solutions, especially anything generated from AI supported software or browsers, during the two hours of competition time. A computer is permitted for viewing PDFs and typing up the report.

The Report

The written portion of the competition pairs with the solutions presented in the drawing portion.
The report will be a minimum of one page and a maximum of two pages. Please use a size 12 point font, single space format for the report.

The report should, at a minimum, include the following:

- A discussion on the cost-benefit analysis of the proposed disaster relief and future mitigation plan, highlighting the priorities of each solution, as a whole and compared to one another, and whether their associated cost can be justified.

- An executive summary providing a summary of the report's content and highlighting any goals and motivations used in the decision process.

- A discussion dedicated to the following: ·ᓚ

  The preparation before the storm will discuss the team's solution to prepare Tropical Ridge for the ensuing storm. Additionally, this should incorporate the elements demonstrated in the drawing portion.

- The plan for a future storm will discuss how the team's future mitigation effort proposal addresses the design flood height selected from the return periods provided at the time of the competition. This should also highlight the priorities for any of the disaster mitigation recommendations made to Tropical Ridge.

- Create a plan and priorities list of where the disaster relief should be targeted:
  - What communities, will it be the most flooded, will it be the main roads, will it be essential services.
  - What resources will be required to provide relief? Boats, number of personnel, food, temporary shelter.
- Once you have a short term solution, provide a revised plan / mark up to the city showing the plan for making the city more resilient in the future to the selected design flood height. Make the design year too high and you might be overdesigning for the allotment of cost, design the year too low and your system will become essentially useless:
  - Determine what if any new infrastructure needs to be implemented.
  - Which communities and areas can get immediate attention, which area will get future attention that will take time.
  - Are you implementing strategies like installing levees, regrading roads, and enhancing basin plumbing? How would you employ storm flood gates, diversion tactics, and power redistribution, utilizing both underground and overhead systems? What are your plans for applying pervious pavements, reclaiming land for river expansion, and prioritizing areas for effective preventative measures to achieve cascading benefits?

Scoring Rubric

The competition will be scored out of 200 points, the report is responsible for 100 points and the submitted marked up city layouts are responsible for the remaining 100 points. A panel of judges will score each portion of the Solutioneering Challenge. See each respective section for scoring criteria:

City Map Layout Presentation (100 pts)

- Ingenuity (30 pts)
  - How effective is the design solution in identifying and addressing the shocks and stressors of the city?
  - Does the solution adequately address the most important stressors to reduce future issues?
- Feasibility and Scalability of the Solution (30 pts)

- Does the solution consider cost implications for the proposed mitigation efforts?
- Does a particular mitigation effort have any underlying assumptions that may make it unfeasible, or impossible, to implement in reality?
- How experimental is the proposed solution?

- Quality of Presentation (20 pts)
  - How effective does the layout drawn in plan communicate the mitigation efforts chosen?
- Report Integration (20 pts)
  - How well does the report incorporate all aspects of the drawn portion of the challenge?
  - Does the report add further context for solutions that are included in the drawn portion? Are any left out?

Written Report (100 pts)

- Executive Summary (25 pts)
  - Does the summary of the report touch on the key goals and drivers of the team's proposed solution?
  - Can a reviewer tie the points discussed in the summary with what is written in the report?
- Technical Writing Quality (25 pts)
  - Does the report maintain a professional tone and consistency required for a proposal to a city's governance?
- Quality of Writing (20 pts)
  - Is the report concise in explaining the teams' ideas?
  - Does the report include only essential information and avoid any unnecessary fluff that Tropical Ridge does not need to know?
- City Map Layout Integration (20 pts)
  - How well does the drawing portion tie into the discussions made in the written report?
  - Does the report add all essential and further context for solutions that are included in the drawn portion?
- Formatting (10 pts)
  - Does the report have a clear structure that makes the content easy to follow?

Important Dates

- Technical Reports due at the end of the two-hour timeframe of the competition through this link: https://forms.gle/ZcLAWrXhViQDg9UG6
- 2026 Southeast Student Symposium Regional Competition March 12-14, 2026 in Boca Raton, FL
    - Competition time and location will be released closer to event.

Questions

Requests for information (RFI) must be sent to james.hare.jacobs@gmail.com with the subject line "Jacobs Solutioneering RFI".