



Concrete Canoe in a Nutshell

Normally each year, Michigan Tech and 200 other Concrete Canoe teams around the nation design and construct a concrete canoe for competition. The winners of regional competitions advance to compete at the prestigious society-wide national, and sometimes international, competition. There are many design steps involved in constructing a concrete canoe; structural analysis is performed on the hull design to inform the mix and reinforcement committees of strength benchmarks that will allow the boat to maintain its structural integrity during races. Additionally, in previous seasons, a display table has been used at competitions to inform how the team constructed the boat. Teams also build stands to support the boat during display-day and judging. Both the display table and stands tie into the annual theme and contribute to the overall competition score.

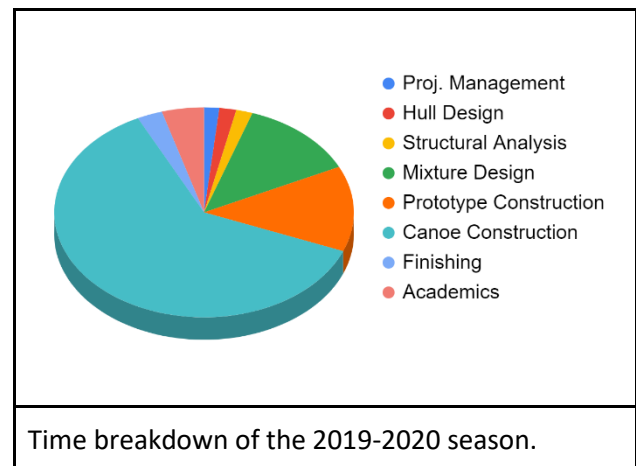
However, due to the COVID-19 pandemic, the rules and regulations that outline the competitions have been significantly altered. New rules were designed such that the 2021 competition year could be held completely virtual, if conditions require.

The biggest change to the competition this year is *not constructing a boat*, and therefore, the racing and display-day portion of the competition were removed as well. To compensate for this, teams are required to complete two enhanced focus areas (EFAs) that improve any aspect of the team and provide team-longevity. Examples of possible EFAs are creating a team website, mock casting a full-scale canoe, or finite element analysis (FEA). Additionally, to replace the annual ethics report, each ASCE chapter now competes in the John

Craig legacy competition, where the submission features Concrete Canoe alumni! Lastly, there is a new element of the competition relating to the technical paper where each team will be required to peer review three randomly assigned teams' papers. In order to compete at the society-wide competition, teams are expected to address their peer-reviewer's comments by either implementing them or providing a reason to not incorporate them into the paper.

Michigan Tech Concrete Canoe 2019-2020

In the 2019-2020 season, the Michigan Tech Concrete Canoe Team was inspired by the complexity of the construction industry. The team strived to join all aspects of the project together in an efficient and effective way, much like the expectations of the construction industry. Before the season was cut short due to COVID-19, the team had put in more than 1,000 person-hours into the project and was able to fully finish the boat, aesthetics and all. Time spent at paddling practice was not included in the 1,000-plus hours.



Aptly named *Dozer*, last year's canoe utilized many features of the previous season's canoe, *Driftwood*. The hull design committee was able



to keep the benefits of the hull design from *Driftwood* while increasing stability, resulting in a well-rounded design.

2020 Michigan Tech Concrete Canoe at a Glance	
Name	Dozer
Weight	215 lbs.
Width	28.1 in.
Length	20 ft.
Depth	15.5 in.

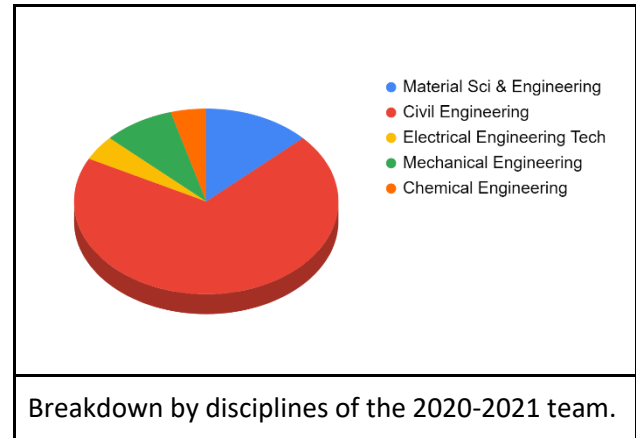
However, because both the national and regional level competitions were canceled last year, the team was not able to compete with *Dozer*. The team was disappointed that their hard work was put on hold due to the COVID-19 pandemic, but looks forward to participating in the 2021 competition, virtually or not, and eagerly awaits the challenges that will come with this new season.



2019-2020 team at the end of casting day for *Dozer*.

Meet the 2020-2021 Team

The construction of a concrete canoe requires extreme dedication and numerous different skill sets. Our team is very fortunate to have over 30 members spanning five different majors who bring different talents to ensure we are able to produce a society-wide competition worthy boat!



2020-2021 Season

Every year, a new theme to base the season around is chosen by team members. The name of the boat, aesthetic design, display, and presentation all tie into the chosen theme; this year's theme is space, with a "boat" name of *Voyager*! This compliments the recent launch of the NASA Mars Perseverance Rover and draws connections between the perseverance of the Michigan Tech team members throughout the 2020-2021 season. Michigan Tech also has many ties to the aerospace industry through their Aerospace and Mining INovation Enterprises.

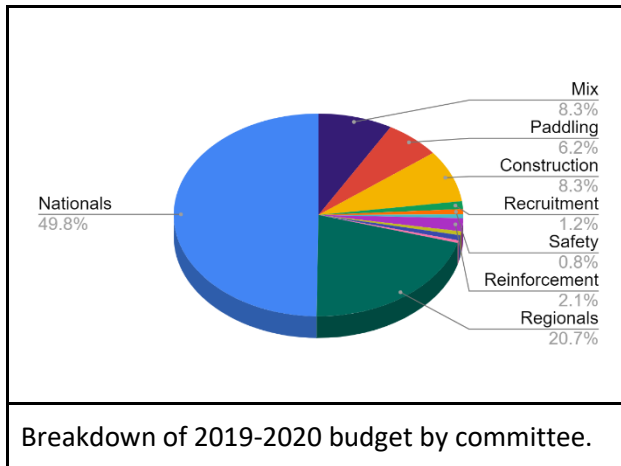
This year, the Michigan Tech Concrete Canoe Team has decided to carry forward their research and development, and specifically focus on improving aspects of the 2019-2020 season for the following two (EFAs):



1. Statistical optimization of the mix and reinforcement scheme using Minitab, a software new to the team
2. Improvement of last year's FEA and the controlled demolition testing of *Dozer* to confirm model predictions.

Categories	Maximum Points
Technical Proposal	35
Enhanced Focus Areas	30
Technical Presentation	25
One-Site Competition (if held)	10
Total Possible	100

New scoring card for the 2021 competitions.



2021 Society-Wide Competition

The 2021 society-wide competition will be hosted by University of Wisconsin Platteville, opposed to the 2020 host of University of Wisconsin Madison. Similar to the regional competition, it has not been announced if this competition will be held virtually or in-person, and further details have not been released.

2021 Regional Competition

The North Central Student Conference regional competition is still being hosted by Ohio Northern University. The scoring of the competition as a whole has changed because racing and final product are no longer parts of competition. As mentioned, the EFAs are now one of the four categories, alongside the typical technical paper and presentation; the presentation has returned to the five-minute presentation accompanied by 10-minutes of questions format. If an on-site competition is held, points will be awarded accordingly, however, logistics for on-site competitions have not been specified yet, as host-schools have until January to decide whether or not it is safe to hold an in-person competition.



Concrete Canoe Team Sponsorship Opportunities

The Michigan Tech Concrete Canoe Team has not only been growing in members, but growing in terms of research and development, where we are finding more innovative and creative methods to construct our canoe. Our successes over the years would not be possible without the dedication of team members and the support of our gracious sponsors.

We are personally asking you to assist us in our **goal of \$19,000 for the 2020-2021 competition year** to support another successful year. Donations of technical expertise, products, or funding of any sort will help lead us to this achievement. As tokens of our appreciation for your generosity, you will be recognized in the following ways based on your level of donation:

Level of Sponsorship	Donation Level	Recognition
Silver	\$50-\$250	- Company/Family name displayed on competition t- shirt
Gold	\$250-\$500	- Company/Family name displayed on competition t- shirt
Platinum	\$500+	- Company/Family name and logo displayed competition t-shirt - Company/Family name and logo displayed all year with the team's canoe on campus

What will my donation be used for?

Michigan Tech has a strong tradition of taking the entire team to competition because each and every person puts in *hours* of time throughout the academic year. However, this year due to COVID-19 and the uncertainty of in-person competitions, we are only budgeting to send the allotted 10 registered participants to competitions. The 2021 regional competition will still be hosted by Ohio Northern University in Ada, Ohio, and the society-wide competition will be hosted by the University of Wisconsin Platteville in Platteville, Wisconsin.

Additionally, the 2021 rules and regulations that outline the competition have been significantly altered to accommodate COVID-19 restrictions; they were designed such that the 2021 competition year could be held completely virtual, if conditions require. The biggest change to the competition this year is *not constructing a boat*, and therefore, the racing and display day portion of the competition were removed as well. The Michigan Tech Concrete Canoe Team plans on utilizing the budget to address long awaited improvements, such as a new trailer and hitch for the paddling team to transport their practice prototypes, and updating the laptop and software used by the hull design committee.



Concrete Canoe Team Sponsorship Opportunities

ESTIMATED EXPENSES FOR 2020-2021

Regional Competition at Ohio Northern University (transportation, lodging, 10 registrations @ \$40/person)	\$2,000
Society-Wide Competition at University of Wisconsin Platteville (transportation, lodging, 10 registrations @ \$350/person)	\$7,000
Improvements (PPE, tools, toolbox, supplies, hull design hardware and software)	\$4,000
Paddling (prototype, new trailer, hitch, pool reservations, equipment upgrades)	\$6,000
2020-2021 ANNUAL FUNDRAISING GOAL:	\$19,000

Interested? Here is how you can help!

1. Make an online donation: <http://www.mtu.edu/giving/>
 - a. Click on "Make a Gift"
 - b. Select the option "Please direct my gift as indicated below"**
 - c. List "The Concrete Canoe Team" in the box**
- OR
2. Send a check, made out to *The Michigan Tech Fund-Concrete Canoe*, to:

The Concrete Canoe Team Michigan Tech University
Civil and Environmental Engineering
1400 Townsend Drive
Houghton, MI 49931

Do not hesitate to ask any questions about the team, and if you are curious about our progress, you are invited to get in contact with us! Contact information can be found below or on the team website at cee.mtu.edu/asce/canoe/contact.html. Please consider becoming a sponsor of the Michigan Tech Concrete Canoe Team. Thank you for your time and consideration and we look forward to hearing from you!

Sincerely,

Senior Captain
Lauren Bowling
lbowlin@mtu.edu
(734) 604-1977

Junior Captain
Lauren Cole
lecole@mtu.edu
(269) 364-4416