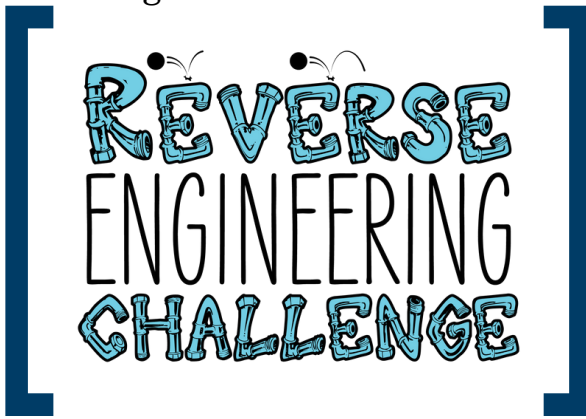


ENGINEERING MACHINE DESIGN CONTEST CHAMPIONSHIP

Featuring the...



FRIDAY, APRIL 22, 2022

Minnesota State University, Mankato



MINNESOTA STATE
Engineering Center of Excellence

Sponsored by

SIEMENS



MINNESOTA STATE UNIVERSITY, MANKATO
COLLEGE OF SCIENCE, ENGINEERING & TECHNOLOGY



MINNESOTA STATE
Energy Center of Excellence



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Greater Mankato Growth

MSU Center for Innovation & Entrepreneurship

MSU Department of Biochemistry, Chemistry, and Geology

MSU Department of Mechanical & Civil Engineering

MSU Food & Agriculture Programs

Region Nine Development Commission

RISEbio

US Navy Outreach and Diversity Team

About

The Minnesota State Engineering Center of Excellence is excited to offer the Engineering Machine Design Contest and Reverse Engineering Challenge programs as a fun and educational way to inspire youth to consider engineering and engineering-related career pathways.

This is the fifth year of existence of the Engineering Machine Design Contest and the second annual Championship event. Teams have advanced from regional contests across Minnesota, Wisconsin, and Iowa to compete for the title of Champion! We are excited to see how they have interpreted the theme of Power the World: Engineering Energy and how they have applied their knowledge of science, technology, engineering, and mathematics to their chain reaction machines.

This is the first-ever Reverse Engineering Challenge (REC). The REC was developed in partnership with the Minnesota 4-H STEM Team to address the need for a low-input, same-day engineering contest to inspire youth. With this being the first of its kind, we are excited to see how it is received by youth! We know there may need to be adjustments along the way, but are committed to providing a quality opportunity that all youth can participate in.

We have been looking forward to this event for a while and cannot wait to see it unfold!

Best of Luck!

Minnesota State Engineering Center of Excellence

Schedule

All locations are in **Myers Fieldhouse** unless otherwise noted.

Engineering Machine Design Championship

8:00 AM	10:00 AM	Check-in
9:45 AM	10:00 AM	Coach Meeting / Q&A
10:30 AM	12:30 PM	Preliminary Round
1:00 PM		Finalists Announced Special Award Ballots Due
1:15 PM	1:30 PM	Special Awards Placed at Machines
1:30 PM	3:30 PM	Finals Round

Reverse Engineering Challenge

8:00 AM	11:30 AM	Check-in
9:00 AM	2:00 PM	Teamwork Judging (Schellberg Gym)
10:00 AM	2:30 PM	Presentation Judging (Various Locations)

General Schedule

10:00 AM	10:15 AM	Opening Remarks
10:00 AM	4:00 PM	Activity Tables & Recorded Interviews
11:30 AM	1:30 PM	Lunch (Conference Room 0129)
12:30 PM	1:00 PM	Educational Sessions #1
1:30 PM	2:00 PM	Educational Sessions #2
3:15 PM	3:45 PM	Educational Sessions #3
4:00 PM	5:00 PM	Awards Ceremony (Ostrander Auditorium)
5:00 PM	6:00 PM	Award Winner Pictures

Activities

Prize Drawing Submissions

Visit an educational table, participate in a 30-minute activity session, or record an interview for your name to be entered into a prize drawing! After engaging in any of these opportunities, you will be able to enter your name into the prize drawing. The drawing will take place at the Awards Ceremony. You may enter your name every time you participate at a table or session!

EMDC People's Choice Award Voting

Vote for your favorite chain reaction machine from the Engineering Machine Design Championship! The machine with the most votes at 1 p.m. will receive the People's Choice Award! One vote per person.



Recorded Interviews

Make your way to the greenscreen in Myers Fieldhouse to record an interview about your experience with the Engineering Machine Design Contest or the Reverse Engineering Challenge. Whether you are a spectator, parent, coach, or student, we want to hear from you! Interviews will be used to promote these programs. Plus, you can enter your name into the prize drawing!

Educational Tables

Be sure to visit the Educational Tables throughout the day! They will be available from 10 a.m. to 4 p.m. These organizations are eager to share about their programs and most will have STEM-related activities to engage with. When you engage, you can enter your name into the prize drawing!

Activity Sessions

During the afternoon there will be three scheduled 30-minute activity sessions. Be sure to join one before they are filled - each session is limited to the first 10 - 20 individuals depending on the session. After participating, you can enter your name into the prize drawing!

Activity Sessions

30-minute activity sessions will take place at 12:30 p.m., 1:00 p.m., and 3:15 p.m. in Myers Fieldhouse. Spaces are limited!

Session A: Engineering Lab Tour

Join us on a visit to mechanical and civil engineering labs! During this 30-minute tour, you will get to see the types of equipment and spaces mechanical and civil engineering students get to experience as they progress through their degree program. The tour will include seeing some of the university student competition products! Tours will be limited to the first 10 students per session.

Session B: DNA Isolation

Did you know that the DNA in your body could stretch from the earth to the sun and back ~600 times!! Yeah, that's a lot of DNA. This activity session will allow you to isolate your own DNA and take it home with you in small helix-shaped vial. Too awesome to not check out! Activity will be limited to the first 20-25 students per session.

Session C: Building Series and Parallel Circuits to Solar Panels

Explore the power of solar energy by building Solar Panel circuits to produce different results. Students can learn how circuits are built and wired to make sure that energy is flowing and producing the expected result and how to change the result by configuring parallel and series circuits. Activity will be limited to the first 20 students per session.

Session D: Mini-Reverse Engineering Challenge

Working in pairs, students will deconstruct an everyday object, learning about its components and how it is made. Then, repurpose it into something new! Students will need to think outside of the box for this one and see where innovation and creative thinking can take them. Limited to the first 10 students!

Educational Tables

Center for Innovation & Entrepreneurship | Learn how CIE helps launch the next generation of entrepreneurs, innovators, and dynamic organizations through education, outreach, and research.

Department of Biochemistry, Chemistry, and Geology | You don't want to miss this one! Tchotchkes, a computer model of the spike protein of the Covid-19 virus, chemistry demonstrations, and more.

Department of Mechanical & Civil Engineering | Chat with current students and faculty! Learn about the experiences you could have as an engineering student including senior design projects and engineering competitions.

Institute for Regenerative Resources and AgriSciences | Learn about the new Food and Ag Program at MSU and potential career pathways!

Minnesota State Energy Center of Excellence | Check out mechanical energy and building control loops and learn how the Center develops and engages students, educators, and employers in developing pathways toward energy careers.

Minnesota State Engineering Center of Excellence | Tinker with Rube Goldberg boards and snap-circuits while learning about engineering design processes.

RISEbio | Chat with current RISEbio students and faculty! Learn how RISEbio helps students be successful in biology. Check out a fun biology activity and get your biology-themed temporary tattoo!

US Navy Outreach and Diversity Team | Learn about STEM career pathways in the U.S. Navy, scholarship programs, and more!

EMDC Teams

Senior Division

	Team Name	Regional Contest, Coach, School
Team 1	Eleva-Strum Engineers	Chippewa Falls, Tyson Rohrsheib, Eleva-Strum
Team 2	6 Pheonixes	Mankato, Russell Torkkola, St. Clair
Team 3	Pius XI	Milwaukee, Cathy Zurawski, Pius XI Catholic
Team 4	Black Lights	Mankato, Russell Torkkola, St. Clair
Team 5	Superheroes Powering the World	St. Ansgar, Devin Schwiesow, St. Ansgar
Team 6	Around the World in 20 Steps	Winona, Nora Gathje, Chatfield
Team 7	The Tesla's	Chippewa Falls, Duane King, Neillsville
Team 8	Udder Nonsense	Winona, Nora Gathje, Chatfield
Team 9	Light the City	St. Ansgar, Amy Price, Sumner-Fredericksburg
Team 10	New Berlin Eisenhower Team Purple	Milwaukee, Dana McLaren, New Berlin Eisenhower
Team 11	Uniting the World One Step at a Time	St. Ansgar, Amy Price, Sumner-Fredericksburg
Team 12	New Berlin Eisenhower Team Gold	Milwaukee, Dana McLaren, New Berlin Eisenhower

Junior Division

	Team Name	Regional Contest, Coach, School
Team 1	Blessed Maria Saints	St. Ansgar, Sheila Miller, Cedar Valley Catholic
Team 2	Milk Science	Anoka, Barry Melcher, St. Francis de Sales
Team 3	Koren Academy	Winona, Amanda Koren, Koren Academy
Team 4	Chernobylites	Anoka, Barry Melcher, St. Francis de Sales
Team 5	The Builders	Chippewa Falls, Becca Klindworth, Flambeau
Team 6	T-55	St. Ansgar, Alicia Wrage, Dike-New Hartford
Team 7	BE	Mankato, Brad Blue, New Century
Team 8	Illuminati	Chippewa Falls, Alexa Schroeder, Wildlands
Team 9	Peace	Mankato, Brad Blue, New Century
Team 10	Energetic Electrons	Anoka, Katie Aarnold, New Testament Christian
Team 11	Elegant Engineers	Chippewa Falls, Alexa Schroeder, Wildlands
Team 12	St. John Stem Club	Anoka, David Inselmann, St. Johns Lutheran
Team 13	The Circle	Chippewa Falls, Vanessa Moessner, Anthony Acres
Team 14	Radioactive Reynolds!	Winona, Eric Paulsen, Cotter
Team 15	Las Bilingual Power Pensadores	Anoka, Julia Breyer, International Spanish Language Academy
Team 16	Neillsville Juniors	Chippewa Falls, Duane King, Neillsville

REC Teams

Senior Division

Session	Team Name	School
9:05-10:30	Mankato East 1	Mankato East High School
9:05-10:30	Mankato East 2	Mankato East High School
9:05-10:30	Mankato East 3	Mankato East High School
9:05-10:30	Mankato East 4	Mankato East High School
9:25-10:50	Mankato East 5	Mankato East High School
9:25-10:50	Mankato East 6	Mankato East High School
9:25-10:50	Mankato East 7	Mankato East High School
9:25-10:50	Mankato East 8	Mankato East High School
9:45-11:10	Mankato East 9	Mankato East High School
9:45-11:10	Mankato East 10	Mankato East High School
10:25-11:50	TMB Engineers	Tracy Public School
10:25-11:50	Glamour Gang	United South Central High School
10:35-12:00	Mario and Sonic's HVAC and Convenience Store Inc	United South Central High School
11:55-1:20	Braaaaap	Anoka High School
11:55-1:20	E-85	Anoka High School
12:05-1:30	Diesel	Anoka High School
12:05-1:30	Minecraft	Anoka High School
12:15-1:40	I See You	Anoka High School
12:15-1:40	Women in STEM	Anoka High School



Senior Division *continued...*

Session	Team Name	School
12:25-1:50	Funshine	Anoka High School
12:25-1:50	Silent Designs	Anoka High School
12:35-2:00	No Smiling	Anoka High School
12:25-2:00	Deception	Anoka High School
12:45-2:10	Tesla	Anoka High School
12:45-2:10	Batman	Anoka High School
12:55-2:20	Fabio	Anoka High School

Junior Division

Session	Team Name	School
9:55-11:20	Pine Harbor 1	Pine Harbor Christian Academy
9:55-11:20	Pine Harbor 2	Pine Harbor Christian Academy
10:05-11:30	Pine Harbor 3	Pine Harbor Christian Academy
10:05-11:30	Pine Harbor 4	Pine Harbor Christian Academy
10:15-11:40	TMB 7th Grade	Tracy Public School
10:15-11:40	TMB 8th Grade	Tracy Public School
11:45-1:10	Blessed Maria Saints	Cedar Valley Catholic School
11:45-1:10	Fabricated Falcons	Flambeau Elementary School

Experiential Division

Session	Team Name	Location
10:35-12:00	Gadget Goblins	Mantorville, MN

EMDC Judges

Senior Division

Aaron Budge, *Minnesota State University Mankato* | Lead Judge

Ashmin Mansingh, *SIEMENS* | General Judge

Christopher Frederick, *Electrical Consultants, Inc.* | Lead Judge

Jennifer Peck, *CESA 10 Wisconsin* | Journal Judge

Jeremy Geske, *Minnesota State University Mankato* | Journal Judge

Jerry Sosinske, *SciMathMN / RQM+* | General Judge

Josh Koehler, *ISG* | Lead Judge

Lori Works, *United States Navy Reserve* | Technical Judge

Michael Compton, *University of Minnesota Extension 4-H* | Journal Judge

Michael Plotter, *Piotter Consulting* | Technical Judge

Nazli Wodzinski, *Minnesota State University Mankato* | Lead Judge

Patrick Heinz, *AGCO* | Technical Judge

Sam Brockshus, *ISG* | General Judge

Junior Division

Dennis Dieken, *ZF* | General Judge

James Mecklenburg, *Retired Educator* | Journal Judge

James Persoon, *Federal Cartridge* | Technical Judge

Jennifer Yedoni, *United States Navy* | Technical Judge

Jessica Blosberg, *Online Education* | Journal Judge

Jon Bormann, *Electrical Consultants, Inc.* | Lead Judge

Lin Chase, *Minnesota State University Mankato* | Lead Judge

Rob Camiso, *United States Navy* | General Judge

Ryan Shirk, *Minnesota State University Mankato* | Lead Judge

Seungchan Woo, *Minnesota State University* | General Judge

Shady Nawara, *Nexplore US* | Technical Judge



REC Judges

Teamwork Judges

Bereket Haile, *Minnesota State University Mankato*

Brian Pichelman, *Minnesota State University Mankato*

Dylan Moore, *Minnesota State University Mankato*

Freeman Moma, *Thin Film Technology Corporation*

Hunter Fier, *Minnesota State University Mankato*

Meklit Shiferaw, *Minnesota State University Mankato*

Mohammad Ilham Nur Bhuiyan, *Itron Inc.*

Mohannad Rayani, *Trimble Inc.*

Pratyush Mishra, *Itron Inc.*

Purva Singh Grover, *Minnesota State University Mankato*

Presentation and Solution Judges

Andrew Regalado, *United States Navy*

Andrew Jones, *Minnesota State University Mankato*

Bryan Petzel, *ISG*

Faiçal Rayani, *Medidata*

Gregory Prunty, *GP Engineering PLLC*

Jake Michalowski, *American Engineering Testing, Inc.*

Jake Jones, *Activar Inc.*

Travis Kittleson, *KATO Engineering*

Acknowledgments

Thank you to all the judges, volunteers, regional contest organizers, and university personnel that have helped to make this event a success! A special thank you to the organizing committee:

Jason Bruns, Mary Sikulu, Melissa Huppert, & Molly Engebretson | *Minnesota State Engineering Center of Excellence*

Joann Jaqua & Samantha Kozelek | *MSU College of Science, Engineering and Technology*

Awards

Reverse Engineering Challenge

Junior & Senior Division Highpoint Teamwork, Highpoint Presentations, and Highpoint Proposed Solution

Junior & Senior Division 3rd Place, 2nd Place, and Champion

Engineering Machine Design Championship

Curb Appeal | for a machine with the best curb appeal that you just want to see it operate.

Die Hard | for a machine that is durable, built to last, and dependable.

Everything but the Kitchen Sink | for a machine that included extensive use of household items.

Wonderfully Wacky | for a machine that had a humorous or entertaining appeal.

Theme Award | for being the team that best identifies and communicates the competition theme.

People's Choice | for a machine that was the fan favorite.

Great Engager | for the greatest number of sponsors through community engagement.

High Achiever | for the highest total value of sponsorships through community engagement.

Siemens Award | for a machine that best demonstrates the spirit of innovation through technology to transform the everyday. Sponsored by Siemens

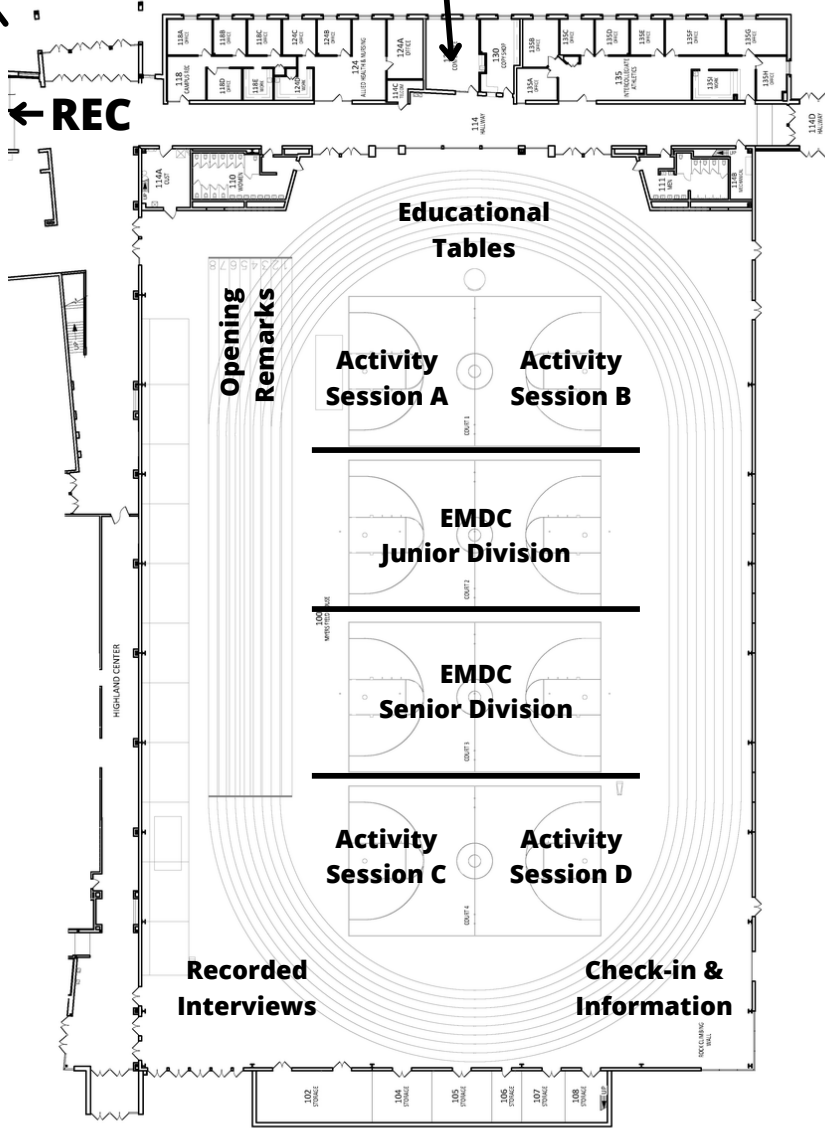
Junior & Senior Division 3rd Place, 2nd Place, and Champion

Event Map

Schellberg Gym

Lunch Room

← REC



Opening Remarks

Activity Session A

Activity Session B

EMDC Junior Division

EMDC Senior Division

Activity Session C

Activity Session D

Recorded Interviews

Check-in & Information

102 OFFICE
103 OFFICE
104 OFFICE
105 OFFICE
106 OFFICE
107 OFFICE
108 OFFICE



Engineering Energy



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**DIGITAL
PROGRAM**

