



College of Eng

MARQUETTE UNIVERSITY

## MESSAGE FROM THE DEAN

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Dear Opus College of Engineering Community:

Welcome to our seventh annual Design Day, a celebration of the design and innovation that goes on throughout the Opus College of Engineering. I look forward to this event each year and the excitement it brings to our building.

Design Day is not only about recognizing the hard work our students have put into their projects over the past year, but it is just as much about celebrating how they have grown as innovators. I believe that with the right mindset and the curiosity to learn, we can all lead innovative projects that will create real, new value and solve some of the world's most pressing problems. Each year I am proud to see that at the heart of all our student design projects, is a desire to deliver meaningful change. This year's projects deliver on that, too.

As you walk through Engineering Hall, you will see senior, freshman, and course-related design projects on display. I hope you will take a moment to talk with our students and hear more about their work. I'm confident that you, too, will be inspired by what you learn.

On behalf of our students, I would like to thank our many generous senior design project sponsors, as well as our college faculty and staff. Without you, this day would not be possible.

Thank you for joining us to celebrate another great year of hard work, innovation, and the students who are already setting our world on fire.

Sincerely,

**Kristina Ropella, Ph.D.**

Opus Dean | Opus College of Engineering  
Marquette University



**BIOMEDICAL ENGINEERING**  
**SENIOR DESIGN PROJECT ORAL PRESENTATIONS**  
**ROOM 136/236**

**SESSION A: ROOM 136**

9:00-9:30                   Otoscope for Telemedicine Applications\*  
 Clinical Advisor:       A. Costello, Marquette University College of Nursing  
 Faculty Advisor:       S. Beardsley  
 Team Members:         S. Allen  
                                   J. Contreras Saavedra  
                                   G. Martinez  
                                   C. Duong  
                                   C. McFarlin  
 MIAD Partners:         H. Anderson  
                                   E. Udovich

9:30-10:00                Activity Center to Engage Child with Disabilities\*  
 Clinical Advisor:       M. Houser, Menominee Falls School District  
 Faculty Advisor:       F. Pintar  
 Team Members:         L. Becker  
                                   A. Bilyeu  
                                   C. Smith  
                                   A. Hruz  
                                   M. Cote  
 MIAD Partners:         R. Sell  
                                   M. Xing

10:00-10:30              Device to Clean Teeth and Remove Plaque\*  
 Clinical Advisor:       A. Bedran-Russo, Marquette University School of Dentistry  
 Faculty Advisor:       J. Goldberg  
 Team Members:         G. Rohde  
                                   A. Thome  
                                   O. Lutz  
                                   A. Onufer  
                                   E. Volk  
 MIAD Partners:         G. Race  
                                   J. Ingle

10:30-11:00              Adaptive Gaming Technology Mounting System\*  
 Sponsor:                C. Hege, eClusion, Milwaukee, WI  
 Faculty Advisor:       B. Silver-Thorn  
 Team Members:         A. Puchalski  
                                   Z. Hadzima  
                                   D. Trimboli  
                                   A. Richards  
                                   J. McCarty  
 MIAD Partners:         D. Streff  
                                   C. Dixon

11:00-11:30              Mobile Health Solution for Remotely Evaluating  
 Motor Function  
 Sponsor:                S. Nemanich, Department of Occupational Therapy,  
 Marquette University  
 Faculty Advisor:       T. Onushko  
 Team Members:         K. Piper  
                                   S. Ernst  
                                   E. Lammers  
                                   S. Sawalhi  
                                   R. Cutlan

11:30-12:00              O<sub>2</sub> Saturation Monitor for Telemedicine Applications\*  
 Clinical Advisor:       A. Costello, Marquette University College of Nursing  
 Faculty Advisor:       D. Cook  
 Team Members:         J. P. Gomez Postigo  
                                   A. Doll  
                                   M. Bradley  
                                   C. Jaworski  
                                   A. Mead  
 MIAD Partners:         P. Hartis  
                                   B. Cole

1:00-1:30                 Model for Teaching Fluid Dynamics of  
 Physiological Processes  
 Sponsor:                M. Vigil, Department of Physics, Marquette University  
 Faculty Advisor:       B. Tefft  
 Team Members:         A. Byrne  
                                   A. Carani  
                                   J. Eddinger  
                                   C. Rogozinski  
                                   B. Carlson

\*Supported by R25 EB013070 from the National Institute of Biomedical Imaging and Bioengineering.

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11:00-11:30 WEAR (WE Energies Augmented Reality) Inspection Assistance  
Sponsor: D. Nestler, WE Energies  
Faculty Advisor: M. Trawicki  
Team Members: M. Awadallah  
A. Beugnet  
N. Broeski  
A. Simon  
R. Yang

11:30-12:00 A Complete Tool for Analyzing and Detecting Cascading Failures in Electric Power Grids  
Sponsor: M. Hayat, Marquette University Opus College of Engineering and Marquette Energy Analytics  
Faculty Advisor: M. Hayat  
Team Members: N. Arns  
B. Nenninger  
J. Popp  
K. Povinelli  
C. Sustar

1:00-1:30 Satellite Networks Communication Simulation  
Sponsor: J. Gao, Marquette University Opus College of Engineering  
Faculty Advisor: J. Gao  
Team Members: J. Bielinski  
R. Gray  
A. Huynh  
N. Lutz  
N. Schaller

1:30-2:00 Privio Website Metamask Backend  
Sponsor: D. Hudetz, Privio  
Faculty Advisor: M. Trawicki  
Team Members: D. Faye  
J. George  
R. Gonzalez  
J. Jacob  
S. Torti

2:00-2:30 Potentiostatic Battery Cell Tester  
Sponsor: A. Spaulding, Milwaukee Tool  
Faculty Advisor: M. Trawicki  
Team Members: M. Alvarez  
B. Angiolo  
Z. Bishop  
A. DeFelippis  
S. Gonzalez

CIVIL, C/oE-Td (J. Bielinski)Tj /Span<</ActualText<FEFF0  
-48Kure12 0 Td [(M. T)79.91.333 Td (Faculty Advisor: )Tj /S

11:00-11:30 AM Drexel Avenue Reconstruction  
Sponsor: R. A. Smith  
Lead Mentor: A. Stasiukevicius  
Other mentors: J. Bruggeman; A. Axt, J. Diekfuss (P4 Infrastructure)  
Team Members: T. Garcia Guarneros  
P. Tennant  
N. Jackson  
I. Luevano

11:30-12:00 Rainworks Challenge  
Mentor: W. McDonald, Marquette University Opus College of Engineering  
Team Members: Z. Meyer  
M. Weltzien  
J. Zwiefelhofer  
J. Branca  
A. Kimmet

1:00-1:30 Marquette University College of Business Administration

Sponsor: Fing1d (Fing1d (Fing1d (Fiud p6S 1:00-1:30 )Tj /Span<</ActualText<FEFF0009>>> BDC ( )Tj MC ern 0 Td (Fing1d (Fin -12 -1.333 Td [(T)80 (eam Members: )  
Sponsor: Fing1d (Fing1d )80 (ea mentors: )Tj /Span<</ActualText<FEFF0009>>> BDC ( )Tj EMC efan and EMC 12 Hefd (oM. W)30 (eltzien)TJ -12 -1.333 Td [(T)80 (eam Members: )TJ /S



**MECHANICAL ENGINEERING**  
**SENIOR DESIGN PROJECT ORAL PRESENTATIONS**  
**ROOM 128**

9:00-9:30                    A Low-cost Stethoscope for Developing Countries  
Sponsor:                    Marquette University Opus College of Engineering  
Faculty Advisor:         V. Cariapa  
Team Members:         A. Beyer  
                                      B. Bouwhuis  
                                      J. Kozin  
                                      O. Miller  
                                      M. Olding  
                                      J. Salas

9:30-10:00                A 4-bar Linkage for Studying Dynamics Efficiently  
Sponsor:                    Marquette University Opus College of Engineering  
Faculty Advisor:         R. Crowley  
Team Members:         C. Dorn  
                                      N. Halaseh  
                                      J. Strohbeck

10:00-10:30                NASA Mars Lunabotics 2022  
Sponsor:                    NASA, Wisconsin Space Grant Consortium  
Faculty Advisor:         P. Voglewede  
Team Members:         T. Carrasco  
                                      B. Charles  
                                      C. Hohl  
                                      P. Larkin  
                                      J. Listowski  
                                      E. Marinic  
                                      C. Piszczek  
                                      J. Podhola  
                                      J. Stinehart  
                                      A. Yakisan

10:30-11:00                Low-cost Water Purifier for Developing Countries  
Sponsor:                    Marquette University Opus College of Engineering  
Faculty Advisor:         V. Cariapa  
Team Members:         G. Beltran  
                                      W. Cruz  
                                      C. Lindsay  
                                      F. San Andres Aquado  
                                      J. Weiss

11:00-11:30                Rocket for Exploring Biomedical Research at an  
Altitude of 10,000 Feet  
Sponsor:                    Marquette University Opus College of Engineering  
Faculty Advisor:         A. Bowman  
Team Members:         S. Keller  
                                      C. Martinez  
                                      P. Naumann  
                                      W. Nikolay  
                                      T. Mark  
                                      Z. Thompson

11:30-12:00                Collapsible Bicycle  
Sponsor:                    Marquette University Opus College of Engineering  
Faculty Advisor:         A. Murray  
Team Members:         J. Aguirre  
                                      T. Mertes  
                                      D. Skaff  
                                      T. Winger  
                                      A. Zulfer

1:00-1:30                    Designing Devices to Protect Toddlers  
Sponsor:                    Marquette University Opus College of Engineering  
Faculty Advisor:         V. Cariapa  
Team Members:         E. Catalan  
                                      J. Locy  
                                      Z. Martin  
                                      B. Stevenson  
                                      D. Tabares-Zamaro

1:30-2:00                    An Exoskeleton that Assists Humans in Performing Difficult  
Physical Tasks  
Sponsor:                    Marquette University Opus College of Engineering and student-tea  
Faculty Advisor:         V. Cariapa  
Team Members:         D. Czapla  
                                      J. Foley  
                                      N. Palomino  
                                      D. Schumann  
                                      A. Walker

2:00-2:30                    A High Pressure, High Flow Rate, Movable Test Station  
Sponsor:                    Sentry Equipment Corporation  
Faculty Advisor:         A. Bowman  
Team Members:         G. Bascunansimone  
                                      L. Chun  
                                      B. Iling  
                                      S. Monroy  
                                      E. Romaniz



