



VIRTUAL
DESIGN DAY
MAY 7, 2021



OPUS

College of Engineering

MARQUETTE UNIVERSITY

SENIOR DESIGN PRESENTATIONS

LEVELS 2-8

BIOMEDICAL ENGINEERING SENIOR DESIGN PRESENTATIONS

Level 2 | Session A: 9:00 a.m. – 1:00 p.m.

Level 3 | Session B: 9:00 a.m. – 11:00 a.m., 11:30 a.m. – 1:00 p.m.

CIVIL, CONSTRUCTION & ENVIRONMENTAL ENGINEERING SENIOR DESIGN PRESENTATIONS

Level 4 | Session A: 9:00 a.m. – 11:00 a.m., 11:30 a.m. – 1:00 p.m.

Session B: Presentations continuing through [Microsoft Teams](#) from 1:00 p.m. – 4:00 p.m.

COMPUTER & ELECTRICAL ENGINEERING SENIOR DESIGN PRESENTATIONS

Level 5 | Session A: 9:00 a.m. – 11:00 a.m., 11:30 a.m. – 1:00 p.m.

Level 6 | Session B: 11:30 a.m. – 1:00 p.m.

MECHANICAL ENGINEERING SENIOR DESIGN PRESENTATIONS

Level 7 | Session A: 9:00 a.m. – 11:00 a.m., 11:30 a.m. – 1:00 p.m.

Level 8 | Session B: 11:30 a.m. – 1:00 p.m.

POSTER PRESENTATIONS

LEVELS 9-11

9:00 – 10:30 AM | COURSE DESIGN PROJECTS

Software Methodologies (Posters E1-E8)

Introduction to Algorithms (Posters E9-E19)

Design of Machine Elements (Posters E20-E38)

LEVEL 12

10:00 – 11:30 AM | BIOMEDICAL ENGINEERING (POSTERS F1-F17)

This session will include posters and mock-ups/prototypes from 17 design teams of new engineering students enrolled in BIEN 1110. The theme of the design projects (sponsored by Ahmed Obeidat, MD – Medical College of Wisconsin) is rehabilitation needs for people with multiple sclerosis that impact care and/or quality of life.

LEVEL 13

11:30 AM – 12:00 PM | GENERAL ENGINEERING (POSTERS G1-G15)

This session will include posters and mock-ups/prototypes from 15 design teams of new engineering students enrolled in GEEN 1210. The theme of the design projects is Water and Energy Sustainability.

KEYNOTE PRESENTATION 11:00 – 11:30 AM

LEVEL 4



Building & Beyond

Mike Stern – Project Manager, J. H. Findorff & Son, Inc.

For over 131 years, Findorff has innovated and evolved to meet the needs of their clients. Completing over \$800M of work annually, Findorff is proud to be considered as one of the largest construction firms in the Midwest. In addition, Findorff is excited to announce their new slogan, Building & Beyond, which represents the energy, innovative services, and expertise Findorff is synonymous with.

Having successfully completed The Commons residence hall in 2018, Findorff is honored and excited to continue their partnership with Marquette University as they embark on the construction of the University's new College of Business Administration project. To help showcase that excitement is today's keynote speaker, Mike Stern, a 2010 College of Engineering graduate who will be discussing Findorff's partnership with Marquette, innovative happenings as well as the future College of Business building.

MESSAGE FROM THE DEAN

Dear Opus College of Engineering Community:

Welcome to our sixth 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 navigate through today's virtual Design Day event, you will see senior, first-year, 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 event and 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

SPECIAL THANKS TO OUR GENEROUS SPONSORS

PREMIUM & KEYNOTE SPONSORS



GOLD SPONSORS



**BIOMEDICAL ENGINEERING
SESSION A
Senior Design Project Oral Presentations**

LEVEL 2

9:00 – 9:30 AM

**BALANCE AND CONCUSSION EVALUATIONS IN
PARA-ICE HOCKEY ATHLETES**

Sponsor: M. Uihlein, US Para Ice Hockey Team
 Faculty Advisor: B. Schmit
 Team Members: T. Fairwood
 C. Smeets
 J. Castiglioni
 M. Pineda
 M. Jones
 C. Sannito (Milwaukee Institute of Art and Design)
 E. Moratti (Milwaukee Institute of Art and Design)

9:30 – 10:00 AM

**DEVICE TO PREVENT INJURIES DUE TO VISUAL
IMPAIRMENT***

Clinical Advisor: K. Jackson, Children’s Hospital of Wisconsin
 Faculty Advisor: D. Cook
 Team Members: N. Waltz
 S. Schabel
 A. Winans
 M. Offe
 P. Myroth

10:00 – 10:30 AM

ASSISTIVE FISHING DEVICE*

Sponsor: J. Gilmore
 Faculty Advisor: D. Cook
 Team Members: J. Love
 M. Weitekammer
 A. Keil
 J. Whelan
 S. Downes

10:30 – 11:00 AM

HEART KART II*

Sponsor: C. Vogel, Ann and Robert Lurie Children’s Hospital of Chicago
 Faculty Advisor: T. Onushko
 Team Members: C. Dyra
 G. Serrano
 K. Knopp
 A. Rising
 Z. Marmitt

11:00 – 11:30 AM

**POWER ASSIST DEVICE FOR HANDCYCLES AND
RECLINING TRICYCLES***

Sponsor: J. Casey, Milwaukee VA Spinal Cord Injury Unit
 Faculty Advisor: J. Goldberg
 Team Members: S. Herson
 G. Sikora
 R. Fischer
 A. Dmello
 D. DeStefano
 S. Cullinan
 B. Lee (Milwaukee Institute of Art and Design)
 J. Homesombath (Milwaukee Institute of Art and Design)
 J. Liang (Milwaukee Institute of Art and Design)

11:30 AM – 12:00 PM

**SEATING SUPPORT SYSTEM FOR INCREASED
INDEPENDENCE***

Sponsor: L. McCarthy
 Faculty Advisor: F. Pintar
 Team Members: C. Higgins
 M. Schunk
 M. Marquez
 A. Broeckert
 P. Streblow (Milwaukee Institute of Art and Design)
 D. Soller (Milwaukee Institute of Art and Design)
 C. Redmond (Milwaukee Institute of Art and Design)

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

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

12:00 – 12:30 PM

REDUCING MEDICATION ERRORS IN THE OPERATING ROOM

Sponsor:
Faculty Advisor:
Team Members:

K. Lauer, Medical College of Wisconsin
J. LaDisa
G. Grad
I. Comia
Z. Relias
C. Gonzalez
A. Wilczynski

12:30 – 1:00 PM

NEUROMUSCULAR RE-EDUCATION TO TREAT THUMB INSTABILITY*

Sponsor:
Faculty Advisor:
Team Members:

N. Hoover, Milwaukee VA Hospital
B. Tefft
J. Heim
M. Strobel
K. Burke
H. Meyer
T. Salinas

9:30 – 10:00 AM

IMPROVEMENTS IN LAPAROSCOPIC CAMERA VISIBILITY*

Clinical Advisor:
Faculty Advisor:
Team Members:

R. Higgins, Froedtert Hospital
J. Goldberg
M. Wanta
L. Humphrey
J. Nemeth
J. Prado
S. Ahmed

10:00 – 10:30 AM

AUDITORY BIOFEEDBACK DEVICE FOR LEG*

Clinical Advisor:
Faculty Advisor:
Team Members:

M. Dygulski, Marquette University
S. Beardsley
D. Plata
J. Cava
J. Gerhardson
K. Moore
M. Kaczmarczyk

10:30 – 11:00 AM

DESIGN OF A NOVEL DENTAL INSTRUMENT FOR ROOT CANAL PROCEDURES*

Sponsor:
Faculty Advisor:
Team Members:

L. Boryc, Marquette University School of Dentistry
B. Wang
W. Louis-Charles
M. Hughes
N. Brennan
R. Garcia
S. Samara

11:00 – 11:30 AM

BREAK

**BIOMEDICAL ENGINEERING
SESSION B
Senior Design Project Oral Presentations**

LEVEL 3

9:00 – 9:30 AM

SPINAL IMPLANT TEST FIXTURE

Sponsor:
Faculty Advisor:
Team Members:

Z. Dooley, SeaSpine
B. Stemper
C. Melendez
N. Georgiou
D. Boss
J. Schweizer
N. Bruns

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

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

11:30 AM – 12:00 PM

PRECISE TESTING OF SMELL LOSS IN COVID-19 PATIENTS

Sponsor: A. Greenberg
Faculty Advisor: A. Greenberg
Team Members: M. Karris
T. Krahn
J. Wilder
Z. Brown
M. Schoonover

12:00 – 12:30 PM

DETECTING HEART SOUNDS DURING TELEMEDICINE VISITS*

Faculty Advisor: G. Garcia
Team Members: L. Ambray
B. Brennan
H. Hartmann
T. Connors
T. Vukosavljevic
B. Kamyk (Milwaukee Institute of Art and Design)
S. Salamon (Milwaukee Institute of Art and Design)

12:30 – 1:00 PM

INDIRECT OPHTHALMOSCOPY USING SMARTPHONES

Sponsor: A. Baseer, Medical College of Wisconsin
Faculty Advisor: R. Cooper
Team Members: A. Santilli
A. Bielek
J. Harnois
N. Vega
A. Evans (Milwaukee Institute of Art and Design)
L. Wettengel (Milwaukee Institute of Art and Design)
J. Jackson (Milwaukee Institute of Art and Design)

**CIVIL, CONSTRUCTION AND ENVIRONMENTAL ENGINEERING
SESSION A
Senior Design Project Oral Presentations**

LEVEL 4

9:00 – 9:30 AM

Sponsor:
Faculty Advisor:
Team Members:

OFFICE BUILDING AT CHICAGO 78 SITE

F. Weiss, The Related Companies Midwest
M. Paddock
J. Brooks
J. Cary
L. Flaherty
J. Martin

9:30 – 10:00 AM

Sponsors:
Faculty Advisor:
Team Members:

KATHY'S HOUSE: A GUEST HOUSE AT THE MEDICAL COLLEGE OF WISCONSIN

C. O'Donnell and M. Hansen, HGA
M. Paddock
G. Adam
R. Gonzini
N. Titterton
M. Waters

10:00 – 10:30 AM

Sponsors:
Faculty Advisor:
Team Members:

NEW OFFICE BUILDING AND PARKING GARAGE DESIGN

T. Kalayil, Thornton Tomasetti & A. Roy, Gilbane Building Co.
M. Paddock
B. Brackin
A. Guidarelli
D. Malec
P. O'Neill

10:30 – 11:00 AM

Sponsor:
Faculty Advisor:
Team Members:

WASTEWATER TREATMENT PLANT UPGRADE FOR PHOSPHORUS REMOVAL

J. Kemp, Black & Veatch
M. Paddock
J. Lindsay
B. Jensen
C. Papineau
J. Smith
M. Stafford

11:00 – 11:30 AM

J. H. FINDORFF & SON, INC. KEYNOTE PRESENTATION

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

11:30 AM – 12:00 PM

NEW OFFICE BUILDING AND PARKING GARAGE DESIGN

Sponsors:
Faculty Advisor:
Team Members:

T. Kalayil, Thornton Tomasetti & A. Roy, Gilbane Building Co.
M. Paddock
H. Hinke
D. Kannin
M. Oechsner
O. Westmoreland

12:00 – 12:30 PM

BRAUN RD CULVERT REPLACEMENT AND ROADWAY RECONSTRUCTION

Sponsor:
Faculty Advisor:
Team Members:

K. Matson, HNTB
M. Paddock
J. Bradley
K. Gwiazdowski
M. Margas
J. O'Brien
B. Packenham

12:30 – 1:00 PM

MARQUETTE MI RENEWABLE ENERGY & BIOSOLIDS HANDLING PROJECT

Sponsor:
Faculty Advisor:
Team Members:

A. Williams, Donohue & Associates
M. Paddock
D. Foren
N. Ladewig
J. Lavin
J. Stroesser

1:30 – 2:00 PM

DREXEL AVENUE RECONSTRUCTION

Sponsor:
Faculty Advisor:
Team Members:

A. Stasiukevicius, R.A. Smith
M. Paddock
M. Dabrowski
J. Drolen
C. Kruse
T. Martin

2:00 – 2:30 PM

JEFFERSON ST. INTERCHANGE RECONSTRUCTION / INTERSTATE 10

Sponsor:
Faculty Advisor:
Team Members:

A. Lewis, Michael Baker
M. Paddock
J. Amoruso
L. Chancellor
E. Hernandez
D. Lammers

2:30 – 3:00 PM

KATHY'S HOUSE: A GUEST HOUSE AT THE MEDICAL COLLEGE OF WISCONSIN

Sponsors:
Faculty Advisor:
Team Members:

C. O'Donnell and M. Hansen, HGA
M. Paddock
W. Brown
J. Palacios
K. Simpson

3:00 – 3:30 PM

SAMARA DISTRICT COSTA RICA CENTRALIZED SANITARY WASTEWATER SOLUTION AND COLLECTION SYSTEM

Sponsor:
Faculty Advisor:
Team Members:

M. Castillo, MSA Professional Services
M. Paddock
M. Ballman
M. Frank
A. Quiles
G. Leverentz

3:30 – 4:00 PM

BRAUN RD CULVERT REPLACEMENT AND ROADWAY RECONSTRUCTION

Sponsor:
Faculty Advisor:
Team Members:

K. Matson, HNTB
M. Paddock
N. Meisner
C. Randall
J. Russ
A. Saravanapandian

CIVIL, CONSTRUCTION AND ENVIRONMENTAL ENGINEERING SESSION B

Senior Design Project Oral Presentations

PRESENTATIONS CONTINUING THROUGH [MICROSOFT TEAMS](#)

1:00 – 1:30 PM

MENOMONEE RIVER LEVEE IMPROVEMENTS WITH RECREATIONAL TRAIL AND BRIDGE

Sponsor:
Faculty Advisor:
Team Members:

M. Mittag, MMSD
M. Paddock
D. Del Conte
J. Lynch
A. Locascio
B. O'Connor

COMPUTER AND ELECTRICAL ENGINEERING
Session A
Senior Design Project Oral Presentations



LEVEL 5

9:00 – 9:30 AM

Sponsor:
 Faculty Advisor:
 Team Members:

SHONAQUIP TRANSPORT PROJECT

B. Sammut and Opus College of Engineering
 C. Tamma
 B. Sammut
 G. Afre

9:30 – 10:00 AM

Sponsor:
 Faculty Advisors:

Team Members:

THE MARQUETTE IRENAEUS PROJECT (MIP)

C. Krall, Department of Theology
 R. Povinelli
 C. Tamma
 M. Callahan
 M. Diaquino
 C. Martin
 Z. Nelson
 R. Joseph

10:00 – 10:30 AM

Sponsor:
 Industry Advisor:
 Faculty Advisor:
 Team Members:

SOLAR DISTRICT CUP 2021

Department of Energy
 D. Nestler, WEC Energy Group
 C. Tamma
 C. Copoulos
 A. Pink
 N. Funteas
 E. Helm
 K. Barndt (Milwaukee Institute of Art and Design)
 S. Cameli (Milwaukee Institute of Art and Design)

10:30 – 11:00 AM

Sponsor:
 Faculty Advisor:
 Team Members:

DISEASE ADVISOR COMPANION APP

A. Lord, Disease Advisor Pty. Ltd. (Australia)
 C. Tamma
 T. Hill
 C. Lee
 S. Bhalla
 M. Zech
 B. Cruz

11:00 – 11:30 AM

BREAK

11:30 AM – 12:00 PM

Sponsor:
 Faculty Advisor:
 Team Members:

SMART CHAIR

C. Ababei
 C. Ababei
 C. Gorski
 M. Lang
 S. McCarthy
 J. Moens
 A. Porter

12:00 – 12:30 PM

Sponsors:
 Faculty Advisor:
 Team Members:

FIREWORKS PARTICULATES MONITORING

S. Schneider and R. L. Schneider, Rho Sigma Associates Scientific Consulting
 S. Schneider
 M. Diehl
 N. Aylward
 J. Salinas
 P. Fritz
 D. Castillo
 J. Holdway

12:30 – 1:00 PM

Sponsors:
 Faculty Advisor:
 Team Members:

NASA LUNABOTICS RMC

NASA and Opus College of Engineering
 P. Voglewede
 E. DeFaut
 J. Edwards
 A. Fernandez
 W. Hansen
 J. Hanley
 J. Johnson
 J. Murray
 T. Wiza

COMPUTER AND ELECTRICAL ENGINEERING
Session B
Senior Design Project Oral Presentations

LEVEL 6

11:30 AM – 12:00 PM

Sponsors:
Faculty Advisors:
Team Members:

MAGNETIC NEAR FIELD 3D SCANNER

J. Richie and C. Ababei
J. Richie and C. Ababei
A. Betancourt
T. Killion
M. Lechowicz

12:00 – 12:30 PM

Sponsor:
Faculty Advisor:
Team Members:

“ARDUINO KILLER” COMPONENT LIBRARY - PHASE 1

S. Schneider
S. Schneider
C. Seda
V. Dominic
R. Latinovich
C. Lim
T. Reyes

12:30 – 1:00 PM

Sponsor:
Faculty Advisor:
Team Members:

MEDICAL GAMING SYSTEM

T. Sinclair, 9 degrees of Human
D. Ye
B. Andersen
A. Berkhout
E. Gainer
M. Ward

MECHANICAL ENGINEERING
Session A
Senior Design Project Oral Presentations

LEVEL 7

9:00 – 9:30 AM

Sponsor:
Faculty Advisor:
Team Members:

LOW-COST GENERATOR

Marquette University
A. Dempsey
F. Batiz
D. Castiblanco
J. Garcia
M. Orndoff
T. Schultz

9:30 – 10:30 AM

Sponsor:
Faculty Advisor:
Team Members:

REBUILD OF MARQUETTE UNIVERSITY LABORATORY FORGING PRESS

Marquette University
J. Domblesky
H. Hidrogo
B. Lucarelli
B. Nowak
R. Sessions

10:00 – 10:30 AM

Sponsor:
Faculty Advisor:
Team Members:

MAKING THE UNDERSTANDING OF MOMENT OF INERTIA MORE FUN

Marquette University
V. Cariapa
A. Fairbank
N. Lindroth
N. Moehn
H. Quijano
A. Voeller

10:30 – 11:00 AM

Sponsor:
Faculty Advisor:
Team Members:

LOW-COST MANUAL PUMP FOR DEVELOPING COUNTRIES

Marquette University
A. Bowman
C. Jemison
J. Keys
J. Radewahn
B. Starsky

11:00 – 11:30 AM

BREAK

11:30 AM – 12:00 PM

**MAKING THE UNDERSTANDING OF FORCES
MORE FUN**

Sponsor:
Faculty Advisor:
Team Members:

Marquette University
V. Cariapa
W.Gately
A. Michels
N. Organ
S. Sinopole

12:00 – 12:30 PM

**LOW-COST WATER PURIFIER FOR DEVELOPING
COUNTRIES**

Sponsor:
Faculty Advisor:
Team Members:

Marquette University
V. Cariapa
M. Aiello
L. Figueroa
V. Marchese
P. McSorley
D. Orsi
J. Vinck

12:30 – 1:00 PM

**REDESIGN OF A LOW-COST STETHOSCOPE FOR
DEVELOPING COUNTRIES**

Sponsor:
Faculty Advisor:
Team Members:

Marquette University
V. Cariapa
S. Cano
H. Gong
C. Hubbard
B. Negassi
D. Stolar
J. Tran

**MECHANICAL ENGINEERING
Session B
Senior Design Project Oral Presentations**

LEVEL 8

11:30 AM – 12:00 PM

**MARQUETTE UNIVERSITY BAJA CAR SHOCK
ABSORBERS**

Sponsor:
Faculty Advisor:
Team Members:

SAE
J. Moore
N. Bertone
K. Christiansen
C. Gay
N. Jones
A. Montalbano
T. Russell
J. Sizemore

12:00 – 12:30 PM

AQUAPONICS FOR THE POOR

Sponsor:
Faculty Advisor:
Team Members:

Marquette University
V. Cariapa
J. Carpenter
J. Reeg
D. Sobski
M. Vander Heiden
N. Woida

12:30 – 1:00 PM

**MAKING THE UNDERSTANDING OF PROJECTILE
MOTION MORE FUN**

Sponsor:
Faculty Advisor:
Team Members:

Marquette University
R. Crowley
Y. Ladeinde
C. Repking
E. Schmidt
C. Tate
N. Wagner

COLLABORATE WITH US

One of the most valuable components of a Marquette engineering education is student interaction with industry partners. If you're interested in learning more about how you can collaborate with our students, our Office of Industry Relations is ready to discuss which opportunities best fit your needs.

Contact Katherine Atkinson, director of industry relations, at (414) 288-7192, or katherine.atkinson@marquette.edu, for more information.



OPUS

College of Engineering

MARQUETTE UNIVERSITY

Senior Design Projects | Student Organizations

Design Day | Job Fair

Professional Development

Summer Undergraduate Research Fellowships

DESIGN DAY 2021