

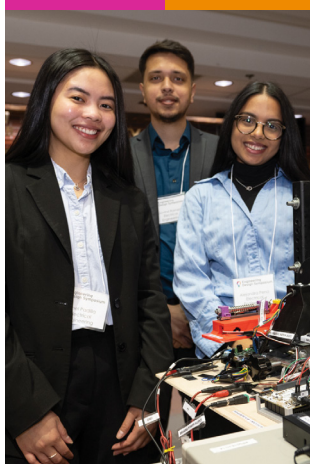


11TH ANNUAL ENGINEERING DESIGN SYMPOSIUM

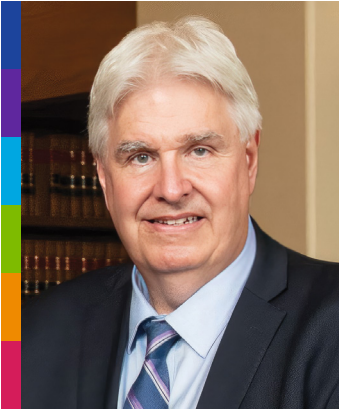
A SHOWCASE OF FINAL YEAR ENGINEERING TEAM DESIGN PROJECTS

**THURSDAY, APRIL 3, 2025 • WU CONFERENCE CENTRE
8:30 A.M. - 5:00 P.M.**

#UNBDESIGN



MESSAGE FROM DR. PAUL J. MAZEROLLE, UNB PRESIDENT AND VICE CHANCELLOR



The Engineering Design Symposium allows final-year engineering students to display their hard work, creativity and talent. Students present their work to peers, industry and the public. Through these capstone design projects, UNB's spirit of entrepreneurship shines.

Throughout their final year of studies, engineering students design solutions for real-world problems from government, industry and non-profit organizations.

These experiential learning opportunities nurture resourcefulness, critical thinking and ingenuity. Each year, several of these projects lead to successfully implemented client-oriented solutions or thriving businesses.

Congratulations to all students taking part in the 2025 symposium. Through a great deal of hard work and forward thinking, you have applied your knowledge and skills to provide fully realized designs and solutions for complex challenges. You make UNB proud.

A sincere thank you to the mentors, professors and industry leaders who have dedicated time, energy and interest in these students and their work. The importance of your stewardship cannot be overstated. You are helping to train and inspire a new generation of innovators and leaders who will change our world for the better.

This event illustrates how UNB engineering students are embracing innovation, finding smart solutions to new and old problems and propelling our communities toward positive change.

With kind regards,

Dr. Paul J. Mazerolle

President & Vice Chancellor | University of New Brunswick

WELCOME FROM DR. JOSHUA LEON, UNB DEAN OF ENGINEERING



On behalf of the University of New Brunswick's faculty of engineering, I would like to welcome all delegates, industry partners, and guests to the 11th annual UNB Engineering Design Symposium.

Capstone projects are the final piece in our bachelor's program. They are meant to be a demonstration of all that students have learned in their program and to demonstrate that they are ready to take on the practice of engineering. The symposium not only provides an opportunity to show what they are capable of, but also provides the public with an opportunity to see, first-hand, the innovative design solutions of our students and to discover new and emerging technologies.

The symposium covers a broad range of engineering disciplines including:

- | | |
|--|---|
| <ul style="list-style-type: none">• chemical engineering• civil engineering• electrical engineering• geological engineering | <ul style="list-style-type: none">• geodesy and geomatics engineering• mechanical engineering• software engineering |
|--|---|

The majority of our projects are sponsored by external clients where students are mentored by practising engineers. This approach to learning goes beyond the classroom and provides students with experiential learning opportunities that develop and enhance the skills and competencies valued in the workplace.

The symposium would not be possible without those who have worked tirelessly planning and organizing the event. I want to thank the instructors of our capstone design courses who provide leadership and direction for our student's experience here at UNB Engineering.

I want to acknowledge our industrial partners who have sponsored projects. I also want to acknowledge the many students and staff who have provided logistic support.

Finally, congratulations to the students who are part of the capstone design experience for your ingenuity, perseverance and hard work. I wish all of you a successful final year and both a rewarding and fulfilling career following graduation.

Dr. Joshua Leon,

Dean of Engineering | University of New Brunswick

SCHEDULE AT A GLANCE

	Room 203	Room 204	Room 208	Room 217	Kent
8:20	Opening Remarks				
8:30	SWE	GGE	CE	ME	ChE
9:00					
9:20					
9:30					
10:00	Break				
10:15	SWE	GGE	CE	ME	ChE
10:45					
11:15	EE	Closing Remarks and Awards	CE	ME	ChE
11:45					
12:15	Lunch				
1:15	EE	—	GE	—	ME
1:45		—	Closing Remarks and Awards CE + GE	Opening Remarks at 1:40 P.M.	
2:15	EE	—	—	TME	
2:30		—	—		
2:45	Break				
3:00	EE	—	—	TME	ME
3:30		—	—		Closing Remarks and Awards
4:00	Closing Remarks and Awards SWE + EE	—	—	Closing Remarks and Awards	—

ChE - Chemical Engineering

CE - Civil Engineering

GE - Geological Engineering

EE - Electrical Engineering

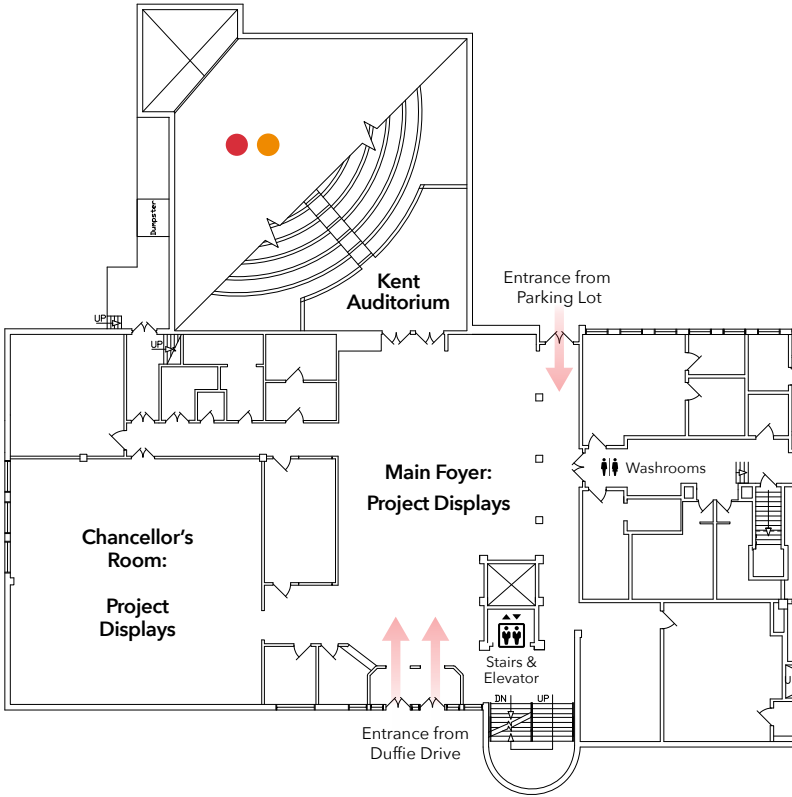
GGE - Geodesy & Geomatics Engineering

ME - Mechanical Engineering

SWE - Software Engineering

TME - Technology Management & Entrepreneurship

FLOORPLAN | FIRST FLOOR - WU CENTRE



CHANCELLOR'S ROOM & FOYER

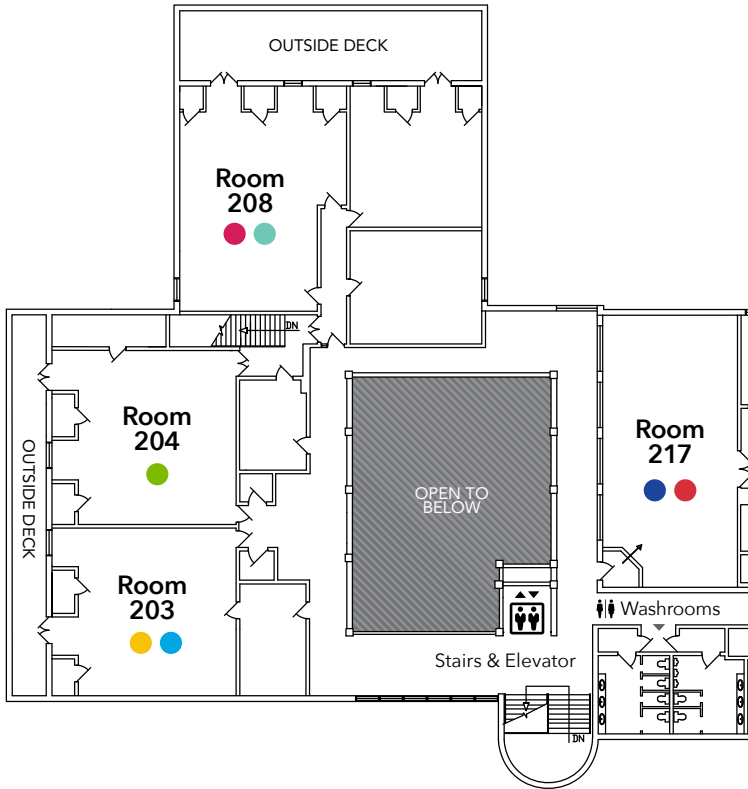
Project Displays

KENT AUDITORIUM:

Chemical Engineering ●

Mechanical Engineering ●

FLOORPLAN | SECOND FLOOR - WU CENTRE



ROOM 203:

Electrical Engineering ●
Software Engineering ●

ROOM 204:

Geodesy & Geomatics ●

ROOM 208:

Civil Engineering ●
Geological Engineering ●

AITKEN ROOM (217):

Mechanical Engineering ●
Technology, Management
& Entrepreneurship ●

CHEMICAL ENGINEERING - KENT AUDITORIUM

- 8:20 A.M. Opening Remarks
- 8:30 A.M. Methanol from Biomass Gasification with Co-Electrolysis
Kaleigh Bourgeois, Samuel Cadrain, Samuel Duplessis, Myra Fletcher, Alexa Pelletier
- 9:00 A.M. Industrial Heat Pump Integration At Saint John Irving Oil Refinery
Jacob Whittaker, Justin Yoo, Kendra Levesque, Vincent Trudel
- 9:30 A.M. Wood Fiber Insulation as an Alternative Cellulose-Based Product
Colby Arsenault, Sharbel Debly, Jackson McElman, Christopher Rice-Wellman
- 10:00 A.M. Break
- 10:15 A.M. Hydrodesulfurization of Biofuels: Impact on Distillate Blending
Camilla Drost, Lois Phillips, Hitoshi Taniguchi
- 10:45 A.M. Optimizing the Future Reausticizing Plant at Irving Pulp and Paper
Sean Ikaia Alviso, David Cheng, Llewellyn Kernighan, Sebastian MacBurnie
- 11:15 A.M. Biomass Boiler Steam Generation
Ethan Devereaux, Houda El Hajjaoui, Ashlyn George
- 11:45 A.M. ChE Closing and Awards

Academic Mentors:

Dr. Wilailak Chanklin (EIT)
Dr. Zhibin He (PEng)
Dr. Yonghao Ni (PEng)
Dr. Kyle Rogers (PEng)

Industry Mentors:

John Campbell (PEng)
Brad McPherson (PEng)
Otto Morales (PEng)
Suresh Pai (PEng)
Mike Richard (PEng)

Judges:

Lionel Hayter, PEng
Rob Sauro, PEng

CIVIL ENGINEERING - ROOM 208

- 8:20 A.M. Opening Remarks
- 8:30 A.M. Newcastle Creek #1 Bridge Replacement
Guillaume Leblanc, Ethan Bragdon, Alexander Gamble, Yunxuan Zhang
- 9:00 A.M. Rehabilitation of Cedar Street in Minto, New Brunswick
Kate Cusack, Nesli Kot, Khyla McCarty, Samantha Moffatt, Pascale Tasse
- 9:30 A.M. Improving River Infrastructure: Three Mile Brook Culvert Replacement with a Steel Girder Bridge
Robert Arnett, Scott Dayton, Indya Michaud, Amanda Wiggins
- 10:00 A.M. Break
- 10:15 A.M. Route NB-970: Road Infrastructure Upgrade
Chris Carson, Wyatt Mifsud, Rhylan Morse, Isaak Somers, Isaac Wagner
- 10:45 A.M. Chignecto Isthmus Storm Surge Barrier
Samyak Bhatta, Cooper Fraser, Brayden Lawless, Morgan Legere, Sophia Maillet
- 11:15 A.M. Slope Stabilization of NB-910 Using Mechanical Reinforcement
Ethan Boyd, Andrew Buckley, Matthew Lint, Jackson Rivington, Jude Yuzda
- 11:45 A.M. Pipe Yard Optimization
Abena Acheamfour Boadu, Daniel Higdon, Nicholas Hughes, Sarah Léger, Alec McLaughlin

Industry Mentors:

James Connors (HILCON)
Peter Loughheed (exp)
Adam Young (HILCON)
Samuel Oshati (GEMTEC)
Nicole Odo (OCRC)

Faculty Mentors:

Dr. Taylor Steele
Dr. Eric Hildebrand
Dr. Won Taek Oh
Dr. Zhen Lei

Judges:

Saeid Metvaei
Leonardo Ferreira de Miranda
Ben Irving

ELECTRICAL ENGINEERING – ROOM 203

- 11:15 A.M. Force Manipulandum (E. Scheme, J. Sensinger)
P. Belzile, D. Clement, H. Holland, T. Standen
- 11:45 A.M. Embedded System Design Sys-MoDEL (K. Bubbar, B. Deboer)
O. Fletcher, E. Kalu, A. Nguyen, Q. Nguyen
- 12:15 P.M. Lunch
- 1:15 P.M. Antenna-Based Sensor for Water Level Monitoring (L. Olule)
C. Black, L. Gierull, E. Irrinki, H. Michaud
- 1:45 P.M. Encrypted Serial Comm Dev System (J. Keys)
K. Derrah, M. Kurilova, M. MacDonald, G. O'Donnell
- 2:15 P.M. Soccer Ball Launcher Control System (Y. Losier)
B. Constable, S. Gray, W. Shi
- 2:45 P.M. Break
- 3:00 P.M. SystemAir (S. Hache, SystemAir)
J. Elliott, J. Hache, B. Robertson
- 3:30 P.M. CubeSat NB Comm System (B. Petersen, T. Lavigne)
D. Deveaux, S. McCann, K. Ojo, A. Salem
- 4:00 P.M. EE and SWE Closing and Awards

Faculty Mentors:

C. Diduch, UNB
C. Rouse, UNB
B. Petersen, UNB
L. Olule, UNB
Z. Khatami, UNB

Instructor:

Troy Lavigne

GEODESY AND GEOMATICS ENGINEERING - ROOM 204

- 8:20 A.M. Opening Remarks
- 8:30 A.M. Effectiveness of Galileo High Accuracy Service for Positioning in Tree Canopy Coverage
Maharshi Gandhi, Aniel Kumar, Darcy Meyer
- 9:00 A.M. Marvel Indoor Sonar Tracker (MIST)
Kelden Ghalay, Zachary Major, Norbu Samdrup
- 9:30 A.M. 3D Digital Twin for Thermal Mapping: A Study of UNB Campus
Florence Berube, Colin Richardson, Anna Sullivan
- 10:00 A.M. Break
- 10:15 A.M. Optimizing Culvert Scans using Modelar
Logan Kennedy, Scott Morrison, Scott Whitters
- 10:45 A.M. Above Ground Biomass Prediction using Sentinel-2 and GEDI Data
Matthew Heffernan, Kevin Lee, Jian Wang
- 11:15 A.M. Training AI to See the Invisible: Data Augmentation for Hyperspectral Image Classification
Matthew Blackmore, Sophie LeGresley, Grant Milczarek
- 11:45 A.M. GGE Closing and Awards

Judges:

David Coleman
Professor Emeritus - UNB

Mackenzie Dale
Legal Surveys Manager -
Property Services Branch, NBDTI

Katie LeBlanc
Acting Chair - New Brunswick
Branch, CIG

Constantino Solano
Director Professional Services -
Teledyne Geospatial

Faculty & Academic Mentors:

Ian Church
Shabnam Jabari
Rakesh Mishra
Michael Sheng
Yun Zhang

Industry Partners:

New Brunswick Department of Transportation and Infrastructure
Modelar

Prizes



\$1,000



\$750



\$500



\$500

GEOLOGICAL ENGINEERING - ROOM 208

1:15 P.M. Prefeasibility Design of a Tailings Dam

**Elena Galbane, Emma Benjamin, Mathew Webb,
Michael Ratliffe, Sarah Carroll**

1:45 P.M. CE and GE Closing and Awards

Industry Mentor:

Adin Richard (BGC)

Faculty Mentor:

Dr. Won Taek Oh

Judges:

Saeid Metvaei

Leonardo Ferreira de Miranda

Ben Irving

MECHANICAL ENGINEERING - ROOM 217 & KENT AUDITORIUM

○ Kent Auditorium

- 8:20 A.M. Opening Remarks
- 8:30 A.M. Using Low Grade Waste Heat for Desalination
Ryan Astles, Pius Botti, Blake Eveleigh, William Rath
- 9:00 A.M. Microtransat - Autonomous Atlantic Crossing, Phase I
Jenna Brewer, Geoffrey Gallant, Morgan Mackenzie, Madison Tilley
- 9:30 A.M. Clogging of Aspiration Ducting
Amirah Abioye, Motunrayo Akinbuwa, Liam Appleby, Remi Levesque, Furqan Siddiqui
- 10:00 A.M. Break
- 10:15 A.M. Passive Cooling and Air Movement
Jamie Brideau, Aiden Hainstock, Evan Raeder
- 10:45 A.M. Evaporative Cooling
Jordyn MacDonald, Kyle Maber, Griffin Thompson, Kenaniah Valentine
- 11:15 A.M. Wave Generation Device for CE Flume Tank
Michael DeLong, Dekker Kiely, Ricardo Machado, Felix Roy
- 11:45 A.M. Co-Generation Bark Dryer
Kinjal Chauhan, Matthew Croft, Gabrielle Picard, Amroz Singh Sandhu
- 12:15 P.M. Lunch
- 1:15 P.M. FDM Nighttime Scoliosis Brace ○
Kristen Culberson, Grace Sanford, Lukas Sharpe, Emma Snow
- 1:45 P.M. High Temperature Torsion Machine ○
Ian Bidgood, Malcolm Dunphy, Tristan Pitt, Sudhish Poojary
- 2:15 P.M. Design of a Propulsion System for Submarine ○
Stanley Brinkman-Mills, Mitchell Pero, Samuel Porter, Evan Watson
- 2:45 P.M. Break
- 3:00 P.M. Walk-In Cooler System ○
Jay Darrah, Christopher Dewinter, Aidan Viau
- 3:30 P.M. ME Awards Presentation and Closing Remarks ○

Faculty Mentors:

Dr. Simoneau

Dr. Haralampides

Dr. Aranas

Dr. Gerber

Dr. Jeans

ME

SOFTWARE ENGINEERING - ROOM 203

- 8:20 A.M. Opening Remarks
- 8:30 A.M. Gesturely (D. MacIsaac)
B. LeBlanc, B. Orr, C. Marquez, F. Radford, M. Brown
- 9:00 A.M. Fun2Learn (E. Scheme)
U. Zangmo, M. MacDonald, P. Ononokpono, S. Asimiea, L. Tsherin
- 9:30 A.M. EVantage (J. Cardenas Barerra)
E. Al Alam, R. Pitre, M. Sharma, C. Pelletier, S. Mossman
- 10:00 A.M. Break
- 10:15 A.M. Tri-Dimensional Chess (Y. Biletskiy)
S. Kariman, J. Huynh, M. Chiasson, E. Alward, A. Subramonian
- 10:45 A.M. Gridstream (S. Saxena, Hero Engineering)
E. Cuenat, C. Dickson, M. Collett, S. Keayes

THANK YOU TO THE GRIDSTREAM PROJECT SPONSOR



HERO
ENERGY & ENGINEERING

Faculty Mentors:

D. MacIsaac, UNB
E. Scheme, UNB
J. Cardenas Barerra, UNB
Y. Biletskiy, UNB

Instructor:

Dr. Shivam Saxena

Industry Mentors:

Dr. Shivam Saxena

SWE

TECHNOLOGY MANAGEMENT & ENTREPRENEURSHIP - ROOM 217

- 1:40 P.M. Opening remarks
- 1:45 P.M. Outdoor Rink Chilling System
Michael Allan [ME], Tylor Henderson [ME], Hunter Jones [EE], Ethan Dever [EE]
- 2:15 P.M. SmartSteer Solutions - Controllable front caster wheels for zero-turn lawn mowers
Adam Derrah [EE], Ethan Drost [EE], Matt Mills [EE], Lucas Wilson [EE]
- 2:45 P.M. Break
- 3:00 P.M. All-In-One Electronics Lab - Modular Instrumentation Platform for Learning
Elyas Meziane [EE], Robert Lewis [EE], Samuel Silberman [EE], William Englehart [EE]
- 3:30 P.M. SafeTrack: An All-in-One Platform for SafeRide Management
Aradhan Furtado [SWE], Jacob Pembleton [SWE], Luvneet Bamrah [SWE], Pavitra Modi [SWE]
- 4:00 P.M. TME Closing and Awards

Faculty Mentors:

Adam Wilson
Andy Simoneau
Zahra Khatami
Joseph Hall
Joshua Keys
Yves Losier
Yevgen Biletskiy
Shivam Saxena

Industry Mentors:

Ayman El-Faramawy, P.Eng
Torsten Reuschel, P.Eng
Eric Neilson
Stacy Smallman
Ed McGinley
Philippe Trottier

Instructors:

Tom Sisk
Dhirendra Shukla

Entrepreneur-in-Residence:

Curtis Kennedy

Designer-in-Residence:

Colin Smith
Andy Bostwick



THANK YOU FOR ATTENDING THE
2025 **ENGINEERING
DESIGN
SYMPOSIUM**

