



12TH ANNUAL ENGINEERING DESIGN SYMPOSIUM

A SHOWCASE OF FINAL YEAR ENGINEERING TEAM DESIGN PROJECTS

THURSDAY, APRIL 2, 2026 • HEAD HALL
8:00 A.M. - 5:00 P.M.

#UNBDESIGN





AN INSIDE
LOOK AT
**ENGINEERING
IN ACTION:**

MESSAGE FROM DR. KATHY WILSON, UNB ACTING PRESIDENT AND VICE CHANCELLOR



UNB's Engineering Design Symposium marks an important milestone for our final year engineering students. It represents the culmination of years of study, problem solving, critical thinking, leadership development and collaboration reflecting the creativity and dedication our students bring to their work.

Throughout their final year, students partner with industry, government and community organizations to design solutions to real world challenges. Many of these challenges are rooted here in New Brunswick, while others address issues felt far beyond our province. These capstone projects bring together our students' technical knowledge, analytical thinking, teamwork and creativity reflecting UNB's strong commitment to experiential learning as a foundation for meaningful and impactful careers.

This symposium is also shaped by the relationships built along the way. Industry partners, professional engineers and mentors who share their expertise and experience, helping students understand what it means to design thoughtfully, responsibly and with purpose. These connections enrich the student experience and prepare graduates to contribute with confidence, whether they choose to build their careers close to home or around the world.

Many of the projects on display today will go on to be implemented for clients or developed into successful start ups. This spirit of innovation and entrepreneurship, supported by hands on learning and mentorship, has long been a hallmark of engineering at UNB. It is one of the ways our graduates make lasting contributions to our economy, infrastructure and communities, while also extending their influence well beyond our borders.

As you explore the projects, I hope you are inspired by the ingenuity, curiosity and care evident in our students' work. The ideas presented here reflect a bright future in which UNB engineers continue a strong tradition of leadership, service and positive impact, both here at home and around the globe.

With appreciation,
Kathy Wilson, RN, PhD
Acting President and Vice Chancellor

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 12th annual UNB Engineering Design Symposium, and the first year it is being held in the Allison McCain Commons.

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 show that they are ready to take on practice engineering. The symposium not only provides an opportunity to show what they are capable of, it also provides the public with an opportunity to see, firsthand, the innovative design solutions of our students and to discover new and emerging technologies.

The symposium covers a broad range of engineering disciplines including:

- chemical engineering
- civil engineering
- electrical engineering
- geological engineering
- geomatics engineering
- mechanical engineering
- software engineering

Most of the projects are sponsored by external clients where students are mentored by practicing 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—especially Theresa Murray in the Dean's Office.

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

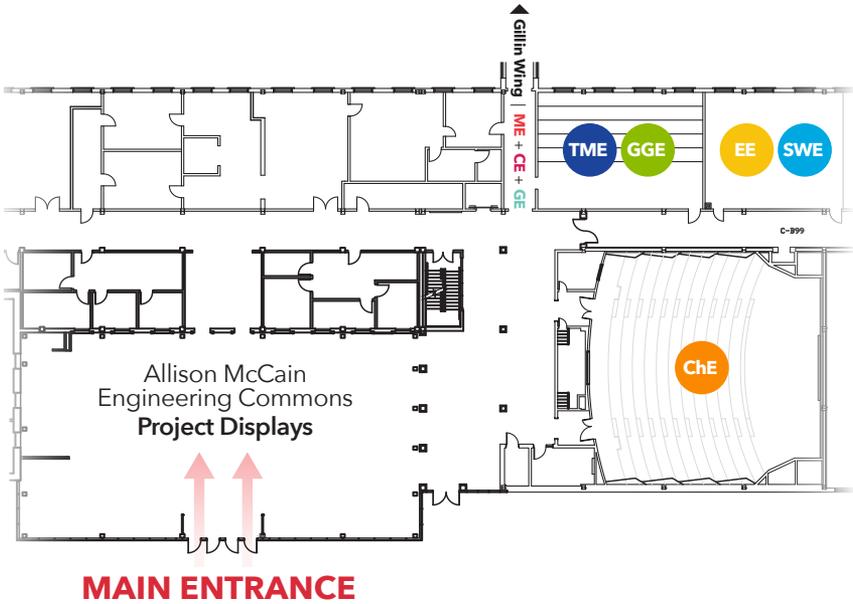
(Meet and greet coffee begins at 8:00 A.M.)

	Room C10	Room C11	Room C13	GWC122	GWC127
8:15	Opening Remarks				
8:30	SWE	GGE	ChE	ME	CE
9:00					
9:20					
9:30					
10:00	Break				
10:15	SWE	GGE	ChE	ME	CE
10:45					
11:15		Closing Remarks and Awards			
11:30					
11:45	—				
12:15	Lunch				
1:15	EE	TME	—	ME	CE
1:45					
2:15					
2:45	Break				
3:00	EE	TME	—	ME	CE
3:30					GE
4:00					
4:30	Closing Remarks and Awards SWE + EE				
5:15		Closing Remarks and Awards			

● ChE - Chemical	● ME - Mechanical
● CE - Civil	● SWE - Software
● EE - Electrical	● TME - Technology Management & Entrepreneurship
● GGE - Geomatics	
● GE - Geological	

SPECIAL ANNOUNCEMENT FROM UNB AND CBCL AT 4 P.M.

FLOORPLAN | GROUND FLOOR - HEAD HALL - C-LEVEL



ALLISON D. McCAIN COMMONS

Project Displays – Both Floors

ROOM C10

Electrical Engineering ●
Software Engineering ●

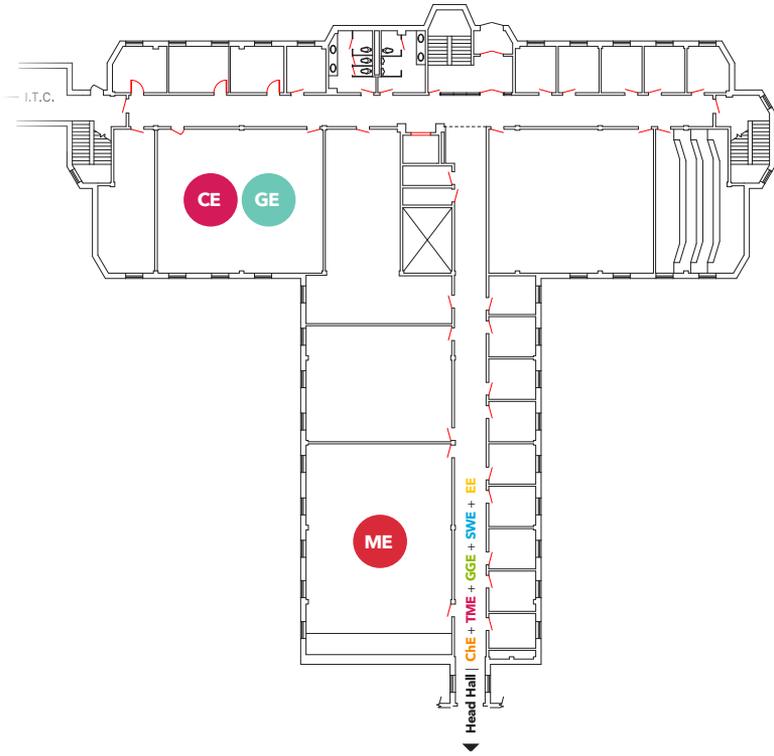
ROOM C11

Geodesy & Geomatics ●
Technology, Management
& Entrepreneurship ●

ROOM C13

Chemical Engineering ●

FLOORPLAN | GROUND FLOOR - GILLIN WING - C-LEVEL



ROOM GWC122
Mechanical Engineering ●

ROOM GWC 127
Civil Engineering ●
Geological Engineering ●

CHEMICAL ENGINEERING - ROOM C13 HEAD HALL

- 8:30 A.M. Industrial Steam Supply from Seawater using Nuclear Heat
Joseph Morin, Nick Orchard-Belyea, Chelsea Pitchford
- 9:00 A.M. Production of High Performance Polyalphaolefins
Base Oil from Wood Feedstock
**Nichole Baya, Gian Carlo Damot, Sébastien Martin,
Kean Van Der Sluys**
- 9:30 A.M. Battery Grade Lithium Hydroxide Production Facility
Samuel Bubar, Bryden Hiscock, Zachary Spencer, Lauryn Wilson
- 10:00 A.M. Break
- 10:15 A.M. Small Scale Post-Combustion Carbon Capture
**Jaswin Krishnamoorthy, Meghna Mandaliya,
Mahmoud Moustafa, Noelle Tapley**
- 10:45 A.M. Upgrading Chlorine Dioxide Generation to Support Project
NextGen at Irving Pulp & Paper
**Maxime Basque, Mackenzie Keenan, Luke Myers-Leblanc,
Peter Nyenhuis**
- 11:15 A.M. Stabilizer Column Optimization for Enhanced
Reformate Separation
**Simon Godin, Amélie Madore, Abhimanyu Mahabaduge,
Jeremy Verner**
- 11:45 A.M. Carbon Dioxide Capture and Recycling for Trailway Brewing
Myles Barnett, Ethan Crowley, Landen MacDonald

Industry Mentors:

Morgan MacGregor, PEng
Brad McPherson, PEng
Otto Morales, PEng
Suresh Pai, PEng
Mike Richard, PEng
Dean Thibault, PEng

Academic Mentors:

Dr. Wilailak Chanklin
Dr. Felipe Chibante
Dr. Zhibin He
Dr. Brian Lowry
Dr. Olga Palazhchenko

Judges:

Lionel Hayter, PEng
Rob Sauro, PEng

CIVIL ENGINEERING – ROOM GWC127 GILLIN WING

- 8:30 A.M. Alleviating Congestion at the Route 15/Wheeler Blvd Rotary
Rankin Brown, Nicholas Donovan, Nicholas Little
- 9:00 A.M. Ring Road – Sunset Drive Roundabout
Cody Hill, Hayden Holdsworth, Frank Nawoussi Nguegang
- 9:30 A.M. Culvert Replacement Options at Two-Mile Brook
Spencer Cole, Brent O’Handley, Gregory Wood
- 10:00 A.M. Break
- 10:15 A.M. Coastal Erosion and Seawall Rehabilitation at Miscou Island
Kate MacKenzie, Charles Toole, Maren Wheaton, Ava White
- 10:45 A.M. Fredericton Botanic Garden Drainage Plan
**Alexa Goodwin, Abigail Haynes,
Lowell MacDonald, Firdaus Omar**
- 11:15 A.M. South Riverfront Walking Trail Berm Design
**Nathanial Doiron, Lucy Kidney, Charlie MacPhee,
Townsend Robichaud**
- 11:45 A.M. Big Hole Tract Subdivision Master Plan – Road, Trail and
Park Networks and Drainage Solution
**Transportation team: Isaac Buchanan, Josephine Chisholm,
Félix-Adam Fournier**
**Hydraulics team: Chandler Campbell, Olivia Gourley,
Waylon Matchett**
- 12:15 P.M. Lunch
- 1:15 P.M. Bishop Drive Multi-Use Trail
**Matthew Mallard, Vraj Govindbhai Patel,
Christopher Schmit, Nikita Sharma**
- 1:45 P.M. Pabineau Band Office Design
Caleb Curwin, Daniel Kamala, Finlay Kearney-Staunton
- 2:15 P.M. Route 105: Keswick River Bridge Replacement
Shawn Carrier, Cameron Harris, Rebekah Kierstead, Kyle Leblanc
- 2:45 P.M. Break
- 3:00 P.M. Low Carbon Concrete: An Evaluation of Natural Pozzolans from
Southern NB as Supplementary Cementitious Materials
Jonathan Beers, Sean Beland, Callen Dockendorff
- 4:15 P.M. CE and GE Awards Presentation and Closing Remarks



Industry Mentors:

Patrick Blanchard
(Dillon Consulting)

James Connors (Hilcon)

Ryan Esligar (Englobe)

Ardalan Ghanizadeh (exp)

Peter Lougheed (exp)

Andrew Northmore (Englobe)

Samuel Oshati (GEMTEC)

Lucas Storey (Dillon Consulting)

Gilman Violette (WSP)

Zhenyong Yang (GEMTEC)

Instructor:

Tom Joyce

Judges:

Saeid Metvaei

Leonardo Ferreira de Miranda



ELECTRICAL ENGINEERING - ROOM C10 HEAD HALL

- 1:15 P.M. Limb Strength Measurement Device Data Interface Unit (C. McGibbon)
Alexander Hunter, Blake Kingston, Dhyan Baruah, Ethen Hovey, Nicholas Lavergne
- 1:45 P.M. High-Power Battery Module Design Tool (RPM)
Benjamin Hughes, Christopher Taylor, Connor Breen, Tyler Jenkins
- 2:15 P.M. C-Therm TLS Handheld Measurement Device (C-Therm)
Connor Yerxa, Faaiz Ali, Marc-Andre Bourgoin, Nathan Holmes
- 2:45 P.M. Break
- 3:00 P.M. CubeSat NB – Deployable Antenna System (L. Olule, B. Petersen)
Connor Williams, Matthew Darville, Owen Mills, Tristan Peterson-Boudreau
- 3:30 P.M. CubeSat NB – VIOLET2 Satellite Comms System (B. Petersen, T. Lavigne)
Blake Davin, Chris Carson, Morgan Kini, Olivia Gerry Rice
- 4:00 P.M. A Wireless Electrified Roadway Demonstration System (C. Rouse)
Andrew Goulard, Christian McAuliffe, Maria Mahmood, Nicholas Ashfield
- 4:30 P.M. EE and SWE Awards Presentation and Closing Remarks

Faculty Mentors:

Hong Chen
Josh Keys
Lillian Olule
Chris Rouse
Ahmed Shehata

Instructor:

Troy Lavigne

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GEOMATICS ENGINEERING - ROOM C11

HEAD HALL

- 8:30 A.M. Optimizing Ontario's Active Control Network for NATRF2022
Emmanuel Bolaji Ajumobi-Obe, Albert Dominique Odi
- 9:00 A.M. Geodetic Control Network Design for New Brunswick
Kallum Fletcher, Bergen Fraser, Ben LeBlanc
- 9:30 A.M. Process Improvement for the New Brunswick Land
Registration System
Owen Crawford, Eric Grenier, Jadon Williams
- 10:00 A.M. Break
- 10:15 A.M. Machine Learning for Hyperspectral Classification for
Vegetation Monitoring
Julien-Patrick Chavy-Waddy, Eric Douglass
- 10:45 A.M. LiDAROD: Development of an Affordable Mobile SLAM Scanner
Samuel Stevens, Thomas Stevens
- 11:15 A.M. Break
- 11:30 A.M. GGE Awards Presentation and Closing Remarks

Judges:

David Coleman
Professor Emeritus – UNB

Raymund Cronin
Survey Engineer – McElhanney

Industry Partners:

Service New Brunswick
Southwest Surveys Ltd.

Mackenzie Dale
Legal Surveys Manager –
Property Services Branch, NBDTI

Constantino Solano
Director Professional Services –
Teledyne Geospatial

Faculty & Academic Mentors:

Shabnam Jabari
Robert Kingdon
Richard Langley
Rakesh Mishra
Michael Sheng
Yun Zhang

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GEOLOGICAL ENGINEERING - ROOM GWC127 GILLIN WING

3:30 P.M. Improving Concrete for the Future: Exploration and Mine Design
for Pozzolanic Rocks in Southern NB

**Sidney Easthouse, Shannon Hegger, Adam Helmke, Vele Rafa
Nonan, Kayla Winters**

4:15 P.M. CE and GE Awards Presentation and Closing Remarks

Industry Mentor:

Greg Healy
(Terrane Geoscience)

Faculty Mentor:

Tom Joyce

Judges:

Saeid Metvaei
Leonardo Ferreira de Miranda



MECHANICAL ENGINEERING - ROOM GWC122

GILLIN WING

- 8:30 A.M. Design of an Autonomous Sailboat for the MicroTransat Challenge
Nicholas Arnsten, Braden Benner, Benjamin MacArthur
- 9:00 A.M. Hardhat Health Monitoring System
Joudi Al-Lathqani, Rochan Melvin, Emilee Morrell, Aya Imdoukh
- 9:30 A.M. F1 Car Conversion
Carter Cahill, John Farrell, Nick Harrison, Ammar Hussein
- 10:00 A.M. Break
- 10:15 A.M. Sawmill Residual System Automatic Cleaning System
Muhammad Khokhar, Colin Matthews
- 10:45 A.M. Semi-Autonomous Platooning for Forestry Logistics
Zachary Duncan, Caleb Enns, Darian Grey
- 11:15 A.M. Powered Mobility System for Underground Drilling Rigs
Julia Lloyd, Nathan Orchard, Luke Simmons, Luke Smith
- 11:45 A.M. Closed Loop Calibration System for Pressure Sensitive Flooring
Oliver Arnfast, Lauren Dysart, Nathanael Heyburn, Ella Ramier
- 12:15 P.M. Lunch
- 1:15 A.M. Design and Build a Hockey Puck Shooter
Noah Buote, Connal Jackman, Adam Loewen, Kyle McEachern
- 1:45 P.M. Design and Build a 3D Printer on a Moving Platform
Craig Bush, Said Obaid, Vincent Poitras
- 2:15 P.M. Development of a Human Powered Submarine II
Darcey Cronin, Jonah Kenny, Gabrielle Powerts, James Wood
- 2:45 P.M. Break
- 3:00 P.M. Design of a High Voltage Battery Enclosure
Conan Danielski, Parita Godgaste, Alexandria Rice-Wellman, Dilraj Singh
- 3:30 P.M. Experimental Apparatus and Procedure for Sensing Additive Material in Machining
Sebastien Carretero, Evan Dowding, Katelyn Guimond, Nickolas Stafford
- 4:00 P.M. Design of a Semi-Autonomous Hydrovane
Shawn Daley, Duncan MacIntyre, Levi Pike, Benjamin Walsh

Faculty Mentors:

Dr. H. Asgari
Dr. A. Gerber
Dr. T. Jeans
Dr. Y. Lu
Dr. M. Mohammadi
Dr. A. Simoneau

Industry Mentors:

Grand Lake Timber, JDI
IBME, Dr. E. Scheme
MAMCE, Dr. M. Mohammadi
Michelin
Point LePreau – NB Power
RPM, Dr. A. Simoneau
Sunny Corner Exploration

**THANK YOU TO OUR CAPSTONE
PROJECT INDUSTRY MENTORS**



**Institute of
Biomedical Engineering**



SOFTWARE ENGINEERING - ROOM C10 HEAD HALL

- 8:30 A.M. EV based Fast Frequency Regulation System
(S. Saxena, Hero Engineering)
**Mathieu Basque, Caleb Carr, Colin Higdon,
Cameron Smith, Kohen Prince-Vautour**
- 9:00 A.M. AquaCharge: A Trustless Energy Management System to
Mobilize Electric Vessels for Sustainable Power Systems
(Y. Biletskiy, C. Santos)
**Mackenzie Cooper, Aidan Foster, Alex Ian Groom,
Lucas Paul Savoie, Cristian Gabriel Vadureanu**
- 9:30 A.M. SmartLIMS: Integrating Deep Learning into an ISO-Compliant
Laboratory Information Management System for
Thermophysical Property Prediction (J. Miles, C-Therm)
**Dennis Cristian, Emma Mattinson, William Mazerolle,
Pierre Ekotto Mebande, Mya Beth Welton**
- 10:00 A.M. Break
- 10:15 A.M. EmgLab: An AI-Assisted EMG Validation Platform
for Collaborative Signal Analysis (D. MacIsaac)
**Tina Kashwani, Ahmad Adnan Khan, Leora Prakash
Mascarenhas, Pratik Mishra, Daniel Oluwatoyosi Olorunfemi**
- 10:45 A.M. Synapse RIMS | Centralized Research Information Management
System for the UNB Biomedical Institute (A. Tabor, J. Sensinger)
Aritra De, Ashok Kumar Thudukuchi Srimurugan
- 11:15 A.M. Gait Biometric Dashboard: A Visualization and Labelling
System for Large Scale Analysis of Gait Biometrics
Nguyen Do, Jonathan Eddie, Aidan Harrison, Sarun Weerakul
- 12:15 P.M. Lunch
- 4:30 P.M. EE and SWE Closing Remarks and Awards

Faculty Mentors:

Y. Biletskiy, UNB	S. Saxena, UNB
D. MacIsaac, UNB	E. Scheme, UNB
J. Miles, UNB	J. Sensinger, UNB
C. Santos, UNB	A. Tabor, UNB

TECHNOLOGY MANAGEMENT & ENTREPRENEURSHIP - ROOM C11 HEAD HALL

- 1:10 P.M. Opening remarks
- 1:15 P.M. Meshed: Automated and Optimized Scheduling Tool
Alexander Cameron, Isla Olesen, Will Ross, Francesa Stewart
- 1:45 P.M. CADD-E: Autonomous Golf Ball Collection Rover
Jakob Ashfield, Noah Lydon, Brett Melanson, Patrick Sullivan
- 2:15 P.M. OZONE: A Robotic, Turret style Hockey Puck Passer Tracking Player Movement
Michael Doiron, Nathaniel Dryden, Dominic Losier, Jake Profit
- 2:45 P.M. Break
- 3:15 P.M. Niavra: Vector – Portable Precision for Construction Professionals
Justin Christie, Dylan Piercey, Sanjib Torafder, Lucas Weeks
- 3:45 P.M. Modulus Power Solutions: Smart Energy Storage
Murray Ferris, Mattias Floyd, Nicholas Tower, Ayden Wright
- 4:15 P.M. Hexoris: High Temperature Thermal Reactor Technology
Lance Keddy, Joshua Pothier, Isaac Richard, William Wilcox
- 4:45 P.M. PassTek: Autonomous Soccer Training Device for Real-time Feedback and Performance Analysis
Michael Bridgland, Ayush Jagtap, Anshul Rattesar, Raghav Talwar
- 5:15 P.M. TME Awards Presentation and Closing Remarks

Faculty Mentors:

Guida Bendrich
Julia Cardenas Barrera
Hong Chen
Frank Collins
Lillian Olule
Andy Simoneau
Shuang Xu

Support Coordinator:

Skye Ables

Instructors:

Dhirendra Shukla
Tom Sisk

Entrepreneur-in-Residence:

Curtis Kennedy
Sam Poirier

Designer-in-Residence:

Andy Bostwick
Colin Smith

Industry Mentors:

Ayman El-Faramawy, P.Eng
Brad McPherson, P.Eng

Judges:

Jeff White CEO – NBIF
Phil Lamey VP – APEGNB
Ryan Mitchell – CEO
SJ Energy
Christine Plourde –
WSP–Canada Inc.

First place: \$2,000

Second place: \$1,000

Third place: \$500



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2026 ENGINEERING
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