



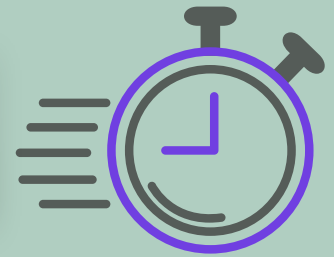
GRADUATE ENGINEERING
COMMUNITY COUNCIL

6TH

Engineering Three-Minute Thesis

MARCH 7, 2025

E 3 M T COMPETITION



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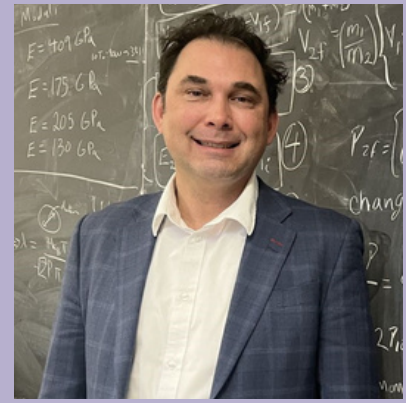


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WELCOME MESSAGE DEAN COLLEGE OF ENGINEERING

Welcome to the 2025 Engineering Three Minute Thesis competition. The Three Minute Thesis format challenges you to make your research accessible to a broader audience. The value of this skill reaches far beyond the competition. Whether you are explaining your work to a potential employer, a funding body, or the general public, the skills you develop here will serve you well throughout your career. The true impact of research is realized when it reaches beyond the academic community and improves the lives of people around the world.

The College of Engineering is proud to be a gold sponsor of this event, alongside the Engineering Advancement Trust. I would like to thank the silver sponsors, SIGMA and OPUS, and the Bronze Sponsor, the USask Graduate Students' Association, for also supporting the work of the Engineering Graduate Community Council in making this event a reality.

I wish the best of luck to all participants, and I look forward to your presentations.

Sincerely,
Michael Bradley, Dean, College of Engineering



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WELCOME MESSAGE DEAN COLLEGE OF GRADUATE & POSTDOCTORAL STUDIES

Welcome to the 6th Engineering 3MT competition, hosted by the Engineering Graduate Community Council (EGCC)! The Three Minute Thesis (3MT) competition is an annual event held at over 200 universities, including USask. Open to thesis-based graduate students, it's a great way to showcase your hard work and make your research accessible to a broader audience.

A typical PhD thesis contains around 80,000 words—years of grueling research, sleepless nights, and history-making breakthroughs. Presenting something of this scale would take approximately nine hours. 3MT competitors distill their complex research into a concise and engaging three-minute presentation with only one static slide, demonstrating their ability to effectively translate and communicate sophisticated ideas.

The winner of the EGCC 3MT will advance to the finals hosted by the College of Graduate & Postdoctoral Studies in April. There, they will have the opportunity to compete for a chance to represent our institution at the Western Regional at the University of Victoria this spring

Thank you, EGCC and the College of Engineering for hosting, and to the student participants—have a great competition!

Debby Burshtyn, PhD
Dean,
College of Graduate & Postdoctoral Studies



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WELCOME MESSAGE ASSOCIATE DEAN RESEARCH AND PARTNERSHIPS

I am pleased to welcome you to the fifth annual Engineering Three Minute Thesis Competition (E3MT), organized by the Engineering Graduate Community Council (EGCC). Students all over the globe have found 3MT competitions to be both challenging and rewarding. The College of Engineering is proud to support this competition organized especially for engineering students. I look forward to watching the presentations and I wish you the best of luck.

I would like to thank the EGCC for organizing this important event. I would also like to extend a special thank you to the Engineering Advancement Trust (EAT) for their generous support that allowed the EGCC to elevate this event for students, alumni, and the community.

I hope that your E3MT experience will be challenging, enjoyable and rewarding. Past participants of E3MT have gone on to excellent performances in the university and regional 3MT competitions, so dream big and keep thinking about where your research can take you next.

Jafar Soltan
Associate Dean Research and Partnerships
Professor of Chemical and Biological Engineering
College of Engineering



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WELCOME MESSAGE

EGCC PRESIDENT

BASHU GAUTAM



Welcome, all graduate students, judges, and faculties!

On behalf of the Engineering Graduate Community Council (EGCC), I would like to share my warm welcome to all participants in the 6th Engineering Graduate Three Minutes Thesis Competition (3MT) on March. 07, 2025!

WE ARE PROUD OF YOU!

I hope you all enjoy the 3MT, and I believe you all will do an excellent job for our Canadian Society and Engineering the World Needs!

Bashu Gautam, PhD Student,
EGCC President
Chemical and Biological Engineering
College of Engineering



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EGCC EXECUTIVES MESSAGE

2024-2025



PARVANEH KORANIAN

VP FINANCE



SARA NATH

VP OPERATIONS



ASUTOSH DALAI

VP ACADEMIC



ANUKUL BASNET

VP STUDENT

Welcome all participants to the 6th annual Engineering 3-Minute Thesis Competition. We would like to congratulate all participants on taking advantage of this opportunity to present your research to us! You have all worked so hard, so take a moment to reflect on what you have accomplished.

We look forward to hearing what everyone has been working on. We come together as a community through events such as these, encouraging our graduate students to be confident about their achievements and providing them with a platform to present their work. Whether you have one year left at this university or four, keep persevering and aim high. Your hard work and enthusiasm will take you far beyond the walls of this university.



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MEET THE EGCC DEPARTMENTAL REPRESENTATIVES 2024-2025



**Parvaneh
koranian**



Sara Nath

Chemical Engineering



Kiranbir Kaur



Faizan Ansari

Mechanical Engineering



Sumana Majumdar



**Emmanuel
Ezechinyelu**

Biological Engineering



Danyil Dmytriiev



Bashu Gautam

Biomedical Engineering



**Deepa Upadhyaya
Subedi**



Bashu Gautam

Electrical and Computer Engineering



Anukul Basnet



Bashu Gautam

Civil, geological and Environmental Engineering



MEET THE JUDGES

Reisha Peters, PhD
Assistant Professor

Dr. Reisha Peters is an Assistant Professor in Chemical and Biological Engineering. Her expertise lies in the application of spectroscopy in the ultraviolet, visible, and near-infrared regions. Her recent work focuses on advancing leaf optical modeling, which has important implications for precision agriculture. From 2024 to 2026, Dr. Peters is a USask Sustainability Fellow working towards embedding sustainability in engineering education.



Hyunjung Shin, Ph.D.
Assistant Professor

Hyunjung Shin is an Assistant Professor in the Department of Curriculum Studies at the University of Saskatchewan. Her research examines how language contributes to social inequality under global political economy and how we may challenge it through transformative pedagogies. She has served as guest editors for special issues of Journal of Multilingual and Multicultural Development (with Joseph Park) and Education Matters.

Ramakrishna (Rama) Gokaraju, Ph.D.
Professor, Electrical and Chemical Engineering

Dr. Ramakrishna (Rama) Gokaraju received his Bachelor of Engineering degree (with Distinction) in Electrical and Electronics Engineering from the Regional Engineering College (National Institute of Technology), Trichy, India in April 1992. He obtained M.Sc. and Ph.D. degrees in Electrical & Computer Engineering from the University of Calgary, Calgary, Canada in June 1996 and May 2000, respectively. He joined the Department of Electrical & Computer Engineering at the University of Saskatchewan as an Assistant Professor in July 2003, received tenure/Associate Professorship in July 2009, and became a professor from July 2015.

During his sabbatical leave (2009-2010 academic year), Dr. Gokaraju was a Visiting Professor in the Department of Electrical & Computer Engineering, University of Manitoba, Winnipeg, Canada. During his sabbatical leave (Jan-June, 2014), he was a visiting professor with Power Research & Development Consultants (PRDC), Bangalore, India, and the University of Queensland, Brisbane, Australia. In his sabbatical from January 1, 2018, to June 30, 2018, he was a Visiting Professor in the Department of Electrical Engineering at the Indian Institute of Technology, Kanpur, India.

Dr. Gokaraju's research is in the area of power system protection and control, smart grid applications, and sustainable energy systems. His current area of research are in High-Speed Digital Relaying, PMU based solutions for Wide Area Protection & Transient Stability Protection, Fault Location, Dynamic Phasor Modelling of Wind Generators & PV Systems, Interrelated Phenomenon Related to Generator Protection & Control, and Sustainable Energy Systems (including nuclear power). Dr. Gokaraju has completed 8 PhD students and 25 plus Master's students. He has published 80 plus papers in major journals and international conferences. He is a registered professional engineer in the Province of Saskatchewan.





MEET THE JUDGES



Nandhakishore Rajagopalan, PhD.
National Research Council of Canada

Dr. Nandhakishore Rajagopalan is the Team Lead for the Future Agri-food Science and Technologies team at the National Research Council of Canada (NRC), Saskatoon. He obtained a PhD degree from the National University of Singapore in 2008 and carried out his Post-Doctoral studies at the University of Heidelberg, Germany. Dr. Rajagopalan joined the NRC as a Research Officer in 2011. He was appointed as an Adjunct Professor at the Department of Chemical and Biological Engineering, College of Engineering at the University of Saskatchewan in November 2021. He has over 20 publications in reputed peer-reviewed scientific journals and holds a patent for the identification of a peptide with biopharmaceutical applications. His scientific accomplishments include the development of a potent synthetic analog of the plant hormone abscisic acid and the characterization of a plant membrane transport protein that provides durable resistance against leaf rust disease in wheat. He has received multiple international awards and recognition, such as, the Young Scientist Award from the Human Proteome Organization (HUPO), the Boehringer Ingelheim Fonds Award and the Alexander von Humboldt Foundation Fellowship. Recently, under NRC's Sustainable Protein Production strategy, he has built a team to establish capabilities in food processing technology development, food chemistry and foodomics.

Erin Kulhawy, PhD, Tech Transfer Office
erin.kulhawy@usask.ca

Erin holds a PhD in neuroscience and has more than six years' experience supporting the commercialization of medical and life sciences technologies in both industry and University settings. In industry, Erin worked for a Canadianbased drug development company, identifying and evaluating new business opportunities in areas of oncology, immunology and neurology. As a Tech Transfer Officer at USask, Erin works closely with University of Saskatchewan researchers to manage intellectual property and commercialization of new inventions, particularly those in the medical and life sciences sectors.



Tate N. Cao, P.Eng, MBA
Assistant Professor

Tate N. Cao is an Assistant Professor in the Ron and Jane Graham School of Professional Development at the University of Saskatchewan. He is the La Borde Chair in Engineering Entrepreneurship and teaches courses on engineering technology management, product design, and entrepreneurship. His research interests include 3D printing in tissue engineering and healthcare, smart farming technologies, and entrepreneurial practices. He has founded and directed the SIGMA Educational Skill Accelerator program and serves on several boards, including the Asian American Innovation Alliance, Co. Learn, Tech Innovation and Engineering Entrepreneurship group at CEEA, and the Pan Canadian Smart Farm Network. Prior to joining USask, he practiced intellectual property law and built and managed startup companies. Prof. Cao received his bachelor's degree in Biomedical Engineering from the Beijing Institute of Technology and his Master's in Biomedical Engineering and MBA from the University of Saskatchewan. He is one of the six USask Sustainability Faculty Fellow and leads the Smart Farming Initiative at the College of Engineering.



MEET THE JUDGES

Bishnu Acharya, PhD.

Saskatchewan Ministry of Agriculture Chair in Bioprocess Engineering
Associate Professor

Dr. Bishnu Acharya is an Associate Professor in the Department of Chemical and Biological Engineering at the University of Saskatchewan and the Saskatchewan Ministry of Agriculture Research Chair in Bioprocess Engineering. His research expertise lies in the area of bioprocessing and conversion, particularly in the emerging area of conversion of biomass to bioproducts for chemical, material, and energy applications by adopting a circular bioeconomy approach. Dr. Acharya's research investigates biomass characterization, thermochemical (torrefaction, hydrothermal, pyrolysis, gasification, combustion), biological (fermentation and anaerobic digestion) and chemical synthesis processes for the conversion of low value biomass to high value bioproducts. Before joining University of Saskatchewan, he worked at the University of Prince Edward Island. Prior to that he worked for Greenfield Research Incorporated in Halifax, Canada as General Manager - Projects where he led several design and training projects for the development of clean technology.

Dr. Acharya is awarded with Engineers PEI - Engineering Excellence Award (2019) for his professional contribution towards the development of innovative bioproducts from nuisance biomass. His scholarly achievements are recognized with UPEI Faculty Association - Scholarly Achievement Award (2019), and Graduate Faculty Appreciation Award (2018). Dr. Acharya research work has been published in 5 book chapters, 70 journal articles and several conferences. He has 1 US provisional patent filed (with another under consideration). In last 7 years, he has supervised/co-supervised more than 40 HQP and has received around 3 million dollars of funding to support his research activities. Dr. Acharya is also a founding member and scientific advisor of a spin off company that focuses on the commercialization of tunicate-based cellulose nanomaterials.

He has bachelor's degree in Mechanical Engineering from Tribhuvan University - Nepal, Masters in Energy Technology from Asian Institute of Technology - Thailand and Doctoral Degree in Mechanical Engineering from Dalhousie University - Canada.



Rana Mustafa, PhD.

Research Facilitator

Dr. Rana Mustafa is a multilingual Food Scientist, Leadership Coach, Positive Intelligence® Coach, and Entrepreneur with over 20 years of expertise in academia, innovation, research, and project management. She has helped hundreds of university students and researchers develop the skills and networks they need to bring their research to market and make an impact beyond the academic world. In her role as a Research Facilitator at the College of Engineering, University of Saskatchewan, Dr. Mustafa supports faculty and researchers by assisting them with grant applications, identifying funding opportunities, and streamlining submission and compliance processes. She also fosters industry partnerships and contributes to the college's strategic research initiatives.

Warren Helgason, PhD., P.Eng.

Associate Professor

Warren Helgason, Ph.D., P.Eng. is an Associate Professor in the Department of Civil, Geological, and Environmental Engineering at the University of Saskatchewan. His research focuses on atmospheric boundary layer processes and energy and mass transport in the soil-plant-atmosphere continuum. The work of Dr. Helgason and his research team contributes to the goal of sustainable agricultural water management on the prairies.





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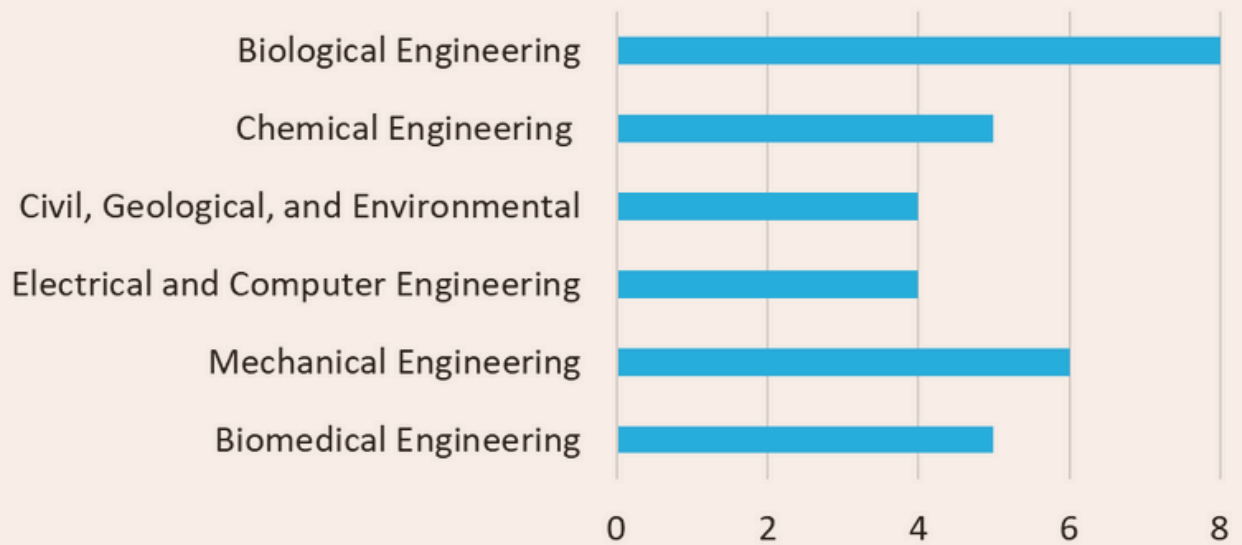




STATISTICS



Department



PH.D.

57%

MASTER

43%



AGENDA



10:30-11:00	Guest & Student Arrival-Swag Bag Pick-Up		
11:00-11:10	Message from the CGPS Dean- Dr. Debby Burshtyn		
11:10-11:25	Welcome and Introduction to the Engineering three minutes thesis competition (E3MT)-EGCC President		
#	Time	Name	Title
1	11:25 AM	Ruorong Yin	Dehulling of Canola
2	11:30 AM	Gopesh Patel	Influence of polydispersity on emulsion gelation
3	11:35 AM	Kayla Walker	Flexible Ultra Short Echo Time (FUSE) MRI of the Patellar Tendon
4	11:40 AM	Md Rezanur Rahman	Observation of flow behaviour in a vertical slot fish pass
5	11:45 AM	Mehryana Alizadeh	Single-atom catalysts
6	11:50 AM	Jane Danoczi	EcoSmart Ore Processing: Enhancing Mining Efficiency and Sustainability
7	11:55 AM	Kathryn Avery	A Breath of Innovation: Combining 3D Bioprinting & Artificial Breathing Machines
8	12:00 PM	Surbhi Takyar	The Mystery of Missing Eggshells
9	12:05 PM	Tahmid Ibn Sayeed	Feasibility of absorption heat pumps in cold climate
10	12:10 PM	Sunana Majumder	Tunicate-derived Cellulose nanocrystals as a Sustainable Stabilizer for oil-in-water Pickering Emulsion
11	12:15 PM	Ganapathy Subramanian Meenakshi Sundaram	Tribo-electrostatic system for protein starch separation
12	12:20 PM	Danyil Dmytriiev	Embrace X-rays: Sharper Focus, Bigger Discoveries
13	12:25 PM	Ernest Agyekum	Transfer of Gaseous Contaminants in Energy Wheels.
14	12:30 PM	Eleonora Inacio Fernandez	From Pixels to insights: Radionics in knee osteoarthritis research
15	12:35 PM	Tate Cao	Presentation from Sigma
16	12:45- 1:15 PM	Lunch	
17	1:20 PM	Yesu Ranya Kandregula	Biomass to renewable bio-based electrodes
18	1:25 PM	Shabnam Izadpanah	Sound Waves and Pea Protein: A Recipe for Better Flavor and Texture?
19	1:30 PM	Mohammadreza Soleimanejad	From Clumps to Clouds: Fluidizing Pea Protein Powder
20	1:35 PM	Ravi Patel	Bio-additives added to cementitious materials: An approach to develop green concrete composites
21	1:40 PM	Talal Ahmed	Development of Bio-adhesive using plant based proteins
22	1:45 PM	Tolen Moirangthem	Degassing beans using radio waves
23	1:50 PM	Garret Churchill	Fields of Fuel: Can we Unlock Fuel Sustainability in Canadian Agriculture Residues?
24	1:55 PM	Samira Khoz	Revealing the Secret Life of Tissue Scaffolds: Engineering the Invisible
25	2:00 PM	Beti Hosseinpour Ganjaroudi	Numerical simulation of droplet generation of three-component immiscible fluids in a T-Junction Microfluidic Lab-On-chip system
26	2:05 PM	Ravichandra Patil	Unlocking the Power of Fats, Oils, and Grease (FOG) Waste for Renewable Energy



AGENDA



27	2:10 PM	Neda Rahaei	Membrane Distillation: A Sustainable Solution for Clean Water and Resource Recovery Enhancing Membrane
28	2:15 PM	Mala Rani Barman	Identifying Tacit Knowledge and Enhancing Test Coverage using Large Language Model
29	2:20 PM	Alimul Haque Khan	Powering Drones Anywhere: A Study on Universal Recharging
30	2:25 PM	Alejandro Recalde	Impact of Sub-lethal concentrations of a Membrane-Active Cationic Agent on the Antimicrobial Resistance and Resilience of E. coli Biofilms Cultivated Under Laminar Flow Conditions
31	2:30 PM	Bakhite Adam	Microstructure investigation of fission products for future nuclear fuel
Closing Ceremonies			
	2:35 PM	Breakout Session for Judging	
	2:40 PM	OPUS Keynote speech	
	2:50 PM	Winner Announcement	
	3:00 PM	Closing Remarks-Dr Sohan	
	3:05 PM	End of Event	





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EGRC COMPETITION

AUGUST 2025



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