

Schulich School of Engineering  
Department of Geomatics Engineering

# GeoDays 2019

February 22-25, 2019

Schulich School of Engineering CNRL Building | Calgary, Alberta



[www.schulich.ucalgary.ca/geomatics](http://www.schulich.ucalgary.ca/geomatics)  
[www.nationalgeomaticscomp.com](http://www.nationalgeomaticscomp.com)  
[www.geomathon.ca](http://www.geomathon.ca)  
[www.ucalgary.ca/gess/](http://www.ucalgary.ca/gess/)

# About

GeoDays 2019 is a series of Geomatics Engineering Events hosted and organised by Students, Faculty and Staff in the Department of Geomatics Engineering, Schulich School of Engineering, University of Calgary.

These events include:

## 1<sup>st</sup> Canadian Engineering Geomatics Conference - CGEC

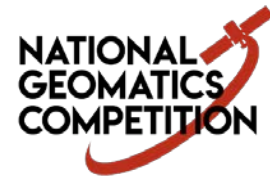


Canadian Geomatics Engineering Conference

This conference will give opportunity to the Geomatics Engineering departments across Canada to meet, exchange ideas, and foster inter-department collaborations for the benefit of students, the programs, and the profession.

## National Geomatics Competition 2019 – NGC

After the success of last year's event in Fredericton, New Brunswick - hosted by University of New Brunswick - the University of Calgary is bringing The National Geomatics Competition (NGC) to Calgary, Alberta! NGC is a student-led consulting engineering competition based in the field of Geomatics Engineering. The focus is to bring together students and industry representatives from across Canada.



## Geomathon



Geomathon is an event to bring together Graduate Students from geospatial related fields, for a day of hacking, designing, and innovating. Geomathon, debuting this year at the University of Calgary, is organized by the Geomatics Graduate Group (G<sup>3</sup>) in collaboration with the Department of Geomatics Engineering, Schulich School of Engineering.

## Geomatics Exposition 2019 – EXPO

The career exposition - hosted every year by Geomatics Engineering Students Society (GESS) - provides the opportunity for Geomatics Engineering students and industry to connect. It's an opportunity for students to learn about the many careers a Geomatics Engineering degree can offer as well as the use of evolving technologies.



# Schedule

## Friday, February 22

NGC	Geomathon	CGEC	Geomatics EXPO
GoGeomatics Social			

## Saturday, February 23

NGC	Geomathon	CGEC	Geomatics EXPO
Case Briefing	Industry Presentation	Keynote & Panel	
Competition	Case Briefing		
	Hack-a-thon		
Lunch			
Competition	Hack-a-thon		
Presentations & Judging	UC Graduate Poster Presentations		
Industry, Faculty, Student Mix & Mingle Network			

## Sunday, February 24

NGC	Geomathon	CGEC	Geomatics EXPO
NovAtel Breakfast & Site Visit	Presentations & Judging		
	Industry Workshop		
Lunch			
Industry Presentations	Industry Presentations		
	Awards		
NGC Awards Gala (Industry Panel and Keynote)			

## Monday, February 25

NGC	Geomathon	CGEC	Geomatics EXPO
			Breakfast
			Expo Booths
			Closing Event

# Canadian Geomatics Engineering Conference

## About

In conjunction with GeoDays 2019, the Department of Geomatics Engineering, Schulich School of Engineering at the University of Calgary and in consultation with other Geomatics Engineering departments across Canada is hosting the 1st Canadian Geomatics Engineering Conference. This conference will give the opportunity to Geomatics Engineering departments/programs in Canada to meet, exchange ideas, and foster inter-department collaborations for the benefit of the students, the programs, and the profession. We aspire to see this Conference develop into a full-fledge Canadian conference on Geomatics Engineering. A conference that will include a scientific program, while at the same time offer the opportunity for the academia in Canada to meet on a regular basis, stay connected, and join forces to face future challenges.

## KEYNOTE SPEAKERS

**Saturday 23<sup>th</sup> February | 8:15 am | ENC 070**



**Jon Salter**

**Associate Director of Education and Research, Esri Canada**

Jon joined Esri Canada in 2019 as Associate Director of Education and Research. He has over 20 years of GIS research and consulting experience, applying it to forestry, multiple objective landscape planning, and urban planning and design. Jon completed his PhD at UBC's Institute for Resources, Environment and Sustainability on community-scale energy planning. Before joining Esri Canada, he was a senior researcher at UBC's School of Architecture and Landscape Architecture, managing an urban planning and design lab that explores interactions between energy, greenhouse gas emissions, and the built environment. Unifying themes in Jon's research include the use of GIS, 3D visualization and scenario planning to explore sustainable futures.



**Georgia Fotopoulos**

**Professor, Queen's University**

Georgia Fotopoulos, PhD, P.Eng. is a professor with the Department of Geological Sciences and Geological Engineering at Queen's University, Canada. Her research interests focus on satellite and physical geodesy, height systems, surveying and remote sensing applications using multi-platform observational systems. She received her PhD from the University of Calgary in the Department of Geomatics Engineering and has served as a professor in the Department of Civil Engineering at the University of Toronto and the Geosciences Department at the University of Texas, Dallas. Over the past two decades Dr. Fotopoulos has been involved in undergraduate and graduate level teaching of various Geomatics Engineering topics for science and engineering applications. She is a registered professional engineer and a member of the PEO Equity and Diversity Committee. Dr. Fotopoulos is the Canadian national correspondent for the International Association of Geodesy.

## Geomatics Engineering Programs in Canada – Past, Present, and Future

Saturday 23<sup>th</sup> February | 9:00 am | ENC 070

Representatives from the other Geomatics Engineering departments providing input on practices, success stories, challenges, enrollment status, trends, collaboration with industry, funding, and outreach activities from their undergraduate and graduate programs.

## Panel: Geomatics Engineering Program and the Profession in Canada

Saturday 23<sup>th</sup> February | 10:10 am | ENC 070

### Panelists:

Dr. Chris Goodall – Managing Director, TDK

Sandy Kennedy – VP Innovation, Hexagon PI

Marie Robidoux – Registrar, Canadian Board of Examiners for Professional Surveyors (CBEPS)

Dr. Yang Gao – Professor, Department of Geomatics Engineering, University of Calgary

Dr. Sameh Nassar – Instructor, Southern Alberta Institute of Technology (SAIT)

# Schedule - CGEC

## Saturday, February 23rd

	ENC 070	ENB 112
08.00 – 08:15	Opening Remarks	
08.15 – 09.00	Keynote: Geomatics Engineering Profession and the Role of Engineering Schools – Challenges and Opportunities <ul style="list-style-type: none"> <li>• Dr. Jon Salter, Assoc. Director of Education and Research, Esri Canada</li> <li>• Dr. Georgia Fotopoulos, Professor, Queen’s University</li> </ul>	
09.00 – 09.50	Geomatics Engineering Schools in Canada – Past, Present, and Future <ul style="list-style-type: none"> <li>• University of New Brunswick (Dr. Peter Dare)</li> <li>• York University (Dr. Jinjun Shan, Dr. Jianguo Wang)</li> <li>• Université Laval (Dr. Francis Roy)</li> <li>• Ryerson University (Dr. Ahmed El-Rabbany)</li> <li>• University of Calgary (Dr. Kyle O’Keefe)</li> </ul>	
09.50 – 10.10	Break	
10.10 – 11.00	Panel: Geomatics Engineering Program and the Profession in Canada Panelists: <ul style="list-style-type: none"> <li>• Industry:               <ul style="list-style-type: none"> <li>○ Dr. Chris Goodall, Managing Director, TDK</li> <li>○ Sandy Kennedy, VP Innovation, Hexagon PI</li> </ul> </li> <li>• Academia:               <ul style="list-style-type: none"> <li>○ Dr. Yang Gao, Professor, University of Calgary</li> <li>○ Dr. Sameh Nassar, Instructor, SAIT</li> </ul> </li> <li>• CBEPS:               <ul style="list-style-type: none"> <li>○ Marie Robidoux, Registrar, CBEPS</li> </ul> </li> </ul>	
11.00 – 11:40	Q&A to Panelists – Reflections (Moderator: Dr. Elena Rangelova)	
11.40 – 12.30	Lunch	
12:30 – 02:00		Geomatics Engineering Programs Meeting (Faculty Only)
06.00 – 08.00	Industry, Faculty, Student Mix & Mingle Network	

# Geomathon

## About

Geomathon is an event to bring together Graduate Students from geospatial related fields, for a day of hacking, designing, and innovating. Geomathon, debuting this year at the University of Calgary, is organized by the Geomatics Graduate Group (G<sup>3</sup>) in collaboration with the Department of Geomatics Engineering, Schulich School of Engineering.

## Geomatics Graduate Group (G<sup>3</sup>)

Geomatics Graduate Group (G<sup>3</sup>) is the Departmental Graduate Association (DGA) of the Department of Geomatics Engineering, Schulich School of Engineering and a member of the Graduate Student Association of the University of Calgary. All graduate students of Geomatics Engineering are members of G<sup>3</sup>.

## PRESENTATIONS (open to all)

### Industry Presentation 1 – TDK

**Saturday 23<sup>th</sup> February | 8.15 am | ENG 224**

### Industry Presentation 2 – Occitipal

**Sunday 24<sup>th</sup> February | 1.00 pm | ENG 224**

### Industry Presentation 3 – Graduate Student Association (GSA)

**Sunday 24<sup>th</sup> February | 1.30 pm | ENG 224**

### Industry Presentation 4 – Profound Positioning

**Sunday 24<sup>th</sup> February | 2.00 pm | ENG 224**

## SPECIAL THANKS

A special thanks to the Graduate Student Association (GSA) Quality Money and the Graduate Engineering Students Consortium (GESC) for supporting Geomathon.



## UCALGARY GEOMATICS ENGINEERING GRADUATE STUDENT RESEARCH POSTERS

### UAV-LICAM System Development: Calibration and Geo-Referencing

Camilo Esteban Cortes Rubio | Dr. Mozhdeh Shahbazi

### Automatic Calibration of Multi-Camera Systems for Mobile Mapping

David Jarron | Dr. Derek Lichti

### Land Administration in Peri-Urban Mombasa, Kenya

Dennis Mbugua Muthama | Dr. Michael Barry

### Developing a 3D Cadastral Data Model in Alberta

Dillon Pullano | Dr. Michael Barry

### Simulation and Visualization of Keplerian Satellite Orbits

Dimitrios Piretzidis | Dr. Michael Sideris

### An Efficient, Hierarchical Viewpoint Planning Strategy for Terrestrial Laser Scanner Networks

Fengman Jia | Dr. Derek Lichti

### Personalized Travel Route Recommendation Using Collaborative Filtering Based on GPS Trajectories

Ge Cui | Dr. Xin Wang

### Comparison of Long-Term Absolute Gravimeter Observation with GRACE and Global Hydrology Models

Joanna Kuczynska-Sieghien | Dr. Michael Sideris

### Photogrammetric Modelling for 3D Reconstruction from a Dual Fluoroscopic Imaging System

Kaleel Al-Durgham | Dr. Derek Lichti

### Modern Perspectives on Coordinates as Evidence and the Alberta Hybrid Cadastre

Matthew Michael Philip Sakatch | Dr. Michael Barry

### Ultrasonic Based Heading Estimation for Aiding Land Vehicle Navigation in GNSS Denied Environment

Mohamed Osama Moursy Ahmed Moussa | Dr. Naser El-Sheimy

### 2D-3D Registration for a Dual Fluoroscopy (DF) Imaging System

Shu Zhang | Dr. Derek Lichti

### Structural Damage Assessment through Automatic Thresholds Definition in Point Clouds Classification

Zahra Hadavandsiri | Dr. Derek Lichti

### Micro-Radar and UWB Aided UAV Navigation in GNSS Denied Environment

Shady Zahran | Dr. Naser EL-Sheimy



# Schedule - Geomathon

## Saturday, February 23rd

	ENC 070	ENG 224	ENG 230
08.00 – 08:15	Opening Remarks		
08.15 – 08:45		TDK Presentation	
08.45 – 09:15		Case Briefing	
09.15 – 10:00		Hack-a-Thon	
10.30 – 10:40			
10.40 – 11:45			
11.45 – 12.30	Lunch		
12:30 – 02:00	UCalgary Graduate Poster Presentations		
02:00 – 05:00			Industry Interviews (TBC)
06.00 – 08.00	Industry, Faculty, Student Mix & Mingle Network		

## Sunday, February 24th

	ENC 070	ENG 224	EASC	OVC Red & White Club
08.00 – 11.00	Geomathon Presentations & Judging			
11.00 – 12:00	Trimble Workshop			
12.00 – 01.00	Lunch			
01:00 – 01:30		Occipital Presentation	Industry Interviews (TBC)	
01.30 – 02.00		GSA Presentation		
02.00 – 02.30		Profound Positioning Presentation		
02.30 – 03.00				
03.00 – 03.30		Geomathon Awards Presentation		
Rest/Break				
05.00 – 05.30				NGC Awards Gala - Arrival
05.30 – 06.00				Industry Q& A Panel
06.30				Dinner - Start
06.45 – 07.30				Keynote: Ivan Maddox, Intermap Technologies

# National Geomatics Competition

## About

The National Geomatics Competition (NGC) is a student-led consulting engineering competition based in the field of Geomatics Engineering. The focus is to bring together students and industry representatives from across Canada.

The goals of the NGC are to increase the visibility of the Geomatics Engineering profession and of the respective programs, give students the opportunity to showcase their knowledge and talents while networking with potential employers and their future colleagues, and inspire the next generation of Geomatics Engineers to work hard and think big.

## PRESENTATIONS (open to all)

### Industry Presentation 1 – Challenger Geomatics Ltd.

Sunday 24<sup>th</sup> February | 1.00 pm | ENC 070

### Industry Presentation 2 – WSP

Sunday 24<sup>th</sup> February | 1.30 pm | ENC 070

### Industry Presentation 3 – Stantec

Sunday 24<sup>th</sup> February | 2.00 pm | ENC 070

### Industry Presentation 4 – Professional Surveyors Canada

Sunday 24<sup>th</sup> February | 2.30 pm | ENC 070

### Industry Presentation 5 – McElhanney Surveying and Mapping

Sunday 24<sup>th</sup> February | 3.00 pm | ENC 070

## Awards Gala (open to ticket holders only)

### INDUSTRY PANEL

Sunday 24<sup>th</sup> February | 5.30 pm | Red & White Club

Challenger Geomatics Ltd.

McElhanney Surveying and Mapping

NovAtel

Professional Surveyors Canada

Stantec

Trimble

WSP

### KEYNOTE SPEAKER

Sunday 24<sup>th</sup> February | 6.45 pm | Red & White Club



**Ivan Maddox**

Executive VP Commercial Solutions, Intermap Technologies

Ivan Maddox is a Surveying Engineer (University of Calgary, class of '96) with over 20 years of experience transforming geospatial information into solutions. Early in his career, he conducted geophysical surveys around the world to support oil and gas exploration. In 2000, he joined Intermap Technologies to support global mapping operations, and over the next six years he helped build Intermap's archive of global geospatial datasets. In 2006, he moved to Intermap's Denver, Colorado headquarters to manage all mapping operations and, eventually, Denver-based production. For the past six years, Ivan has been the product manager for InsitePro®, Intermap's flood risk assessment software that has made flood insurance possible for many homeowners in previously under-insured regions of the US and Canada. Today, as EVP of Commercial Solutions, Ivan is bringing together proprietary geospatial data and cutting-edge analytics to deliver effective and innovative software into new markets.

# Schedule – National Geomatics Competition

## Saturday, February 23rd

	ENC 070	ENG 230	Various Rooms
08.00 – 08:15	Opening Remarks		
08.15 – 08:45		Case Briefing	
08.45 - 10:00			
10.30 – 10.40	Break		
10.40 – 11:45			Competition
11.45 – 12.30	Lunch		
12:30 – 03:00			
03:00 – 05.00	NGC Presentations & Judging		
06.00 – 07.30			Industry, Faculty & Student Networking Mix & Mingle
07.30 – 08.00			

## Sunday, February 24th

	ENC 070	EASC	OVC Red & White Club	Offsite
09.00 - 12:00				NovAtel Breakfast Site Visit  <b>NGC Delegates Only</b>
12.00 – 01.00	Lunch			
01:00 – 01:30	Challenger Geomatics Ltd. Presentation	Industry Interviews (TBC)		
01.30 – 02.00	WSP Presentation			
02.00 – 02.30	Stantec Presentation			
02.30 – 03.00	Professional Surveyors Canada Presentation			
03.00 – 03.30	McElhanney Surveying and Mapping Presentation			
Rest/Break				
05.00 – 05.30			NGC Award Gala - Arrival	
05.30 – 06.00			Panel	
06.30			Dinner - Start	
06.45 – 07.30			Keynote: Ivan Maddox, Intermap Technologies	

# Geomatics Exposition

## About

The career exposition - hosted every year by Geomatics Engineering Students Society (GESS) - provides the opportunity for Geomatics students and industry to connect. It's an opportunity for students to learn about the many careers a Geomatics Engineering degree can offer as well as what the evolving technologies are being used for.

## INTERACTIVE INFORMATION SESSIONS

### Interactive Information Session – Trimble

**Monday 25<sup>th</sup> February | Bottom of ENG Social Staircase**

### Interactive Information Session Workshop – Esri Canada

**Monday 25<sup>th</sup> February | Bottom of ENG Social Staircase**

### Interactive Information Session Workshop – NovAtel

**Monday 25<sup>th</sup> February | Bottom of ENG Social Staircase**

## WORKSHOP (open to Graduate & Undergraduate Students)

### Industry Technical Workshop – Esri Canada

**Tuesday 26<sup>th</sup> February | 8.00 am | TBC**

# Schedule - Geomatics Exposition

**Monday, February 25th**

	ENG Atrium	ENG Social Staircase	MacEwan Student Centre Black Lounge
08.00 – 09.00	Breakfast		
09.00 – 10.00	Career Exposition		
10.00 – 12.00		Interactive Info Session <ul style="list-style-type: none"> <li>- Trimble</li> <li>- Esri Canada</li> <li>- NovAtel</li> </ul>	
12.00 – 01.00	Lunch		
01:00 – 04.00	Career Exposition		
04.00 – 10.00			Closing Event



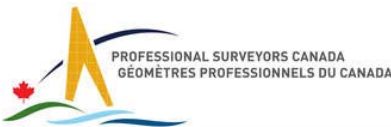




# Sponsors

## National Geomatics Competition & Geomatics Exposition

### PLATINUM



### GOLD



### SILVER



## BRONZE



## MEDIA SPONSOR



## Geomathon

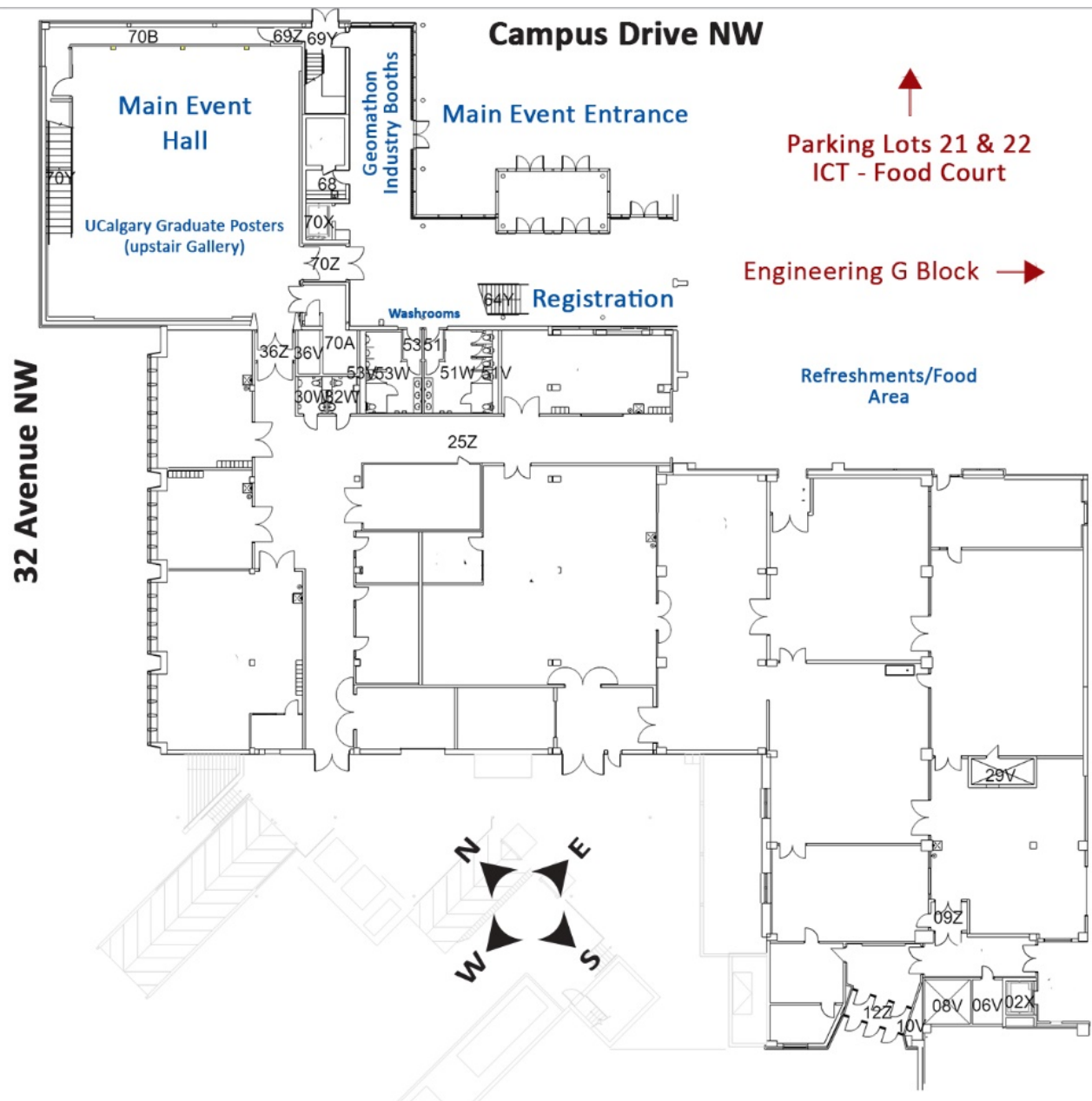
### Gold



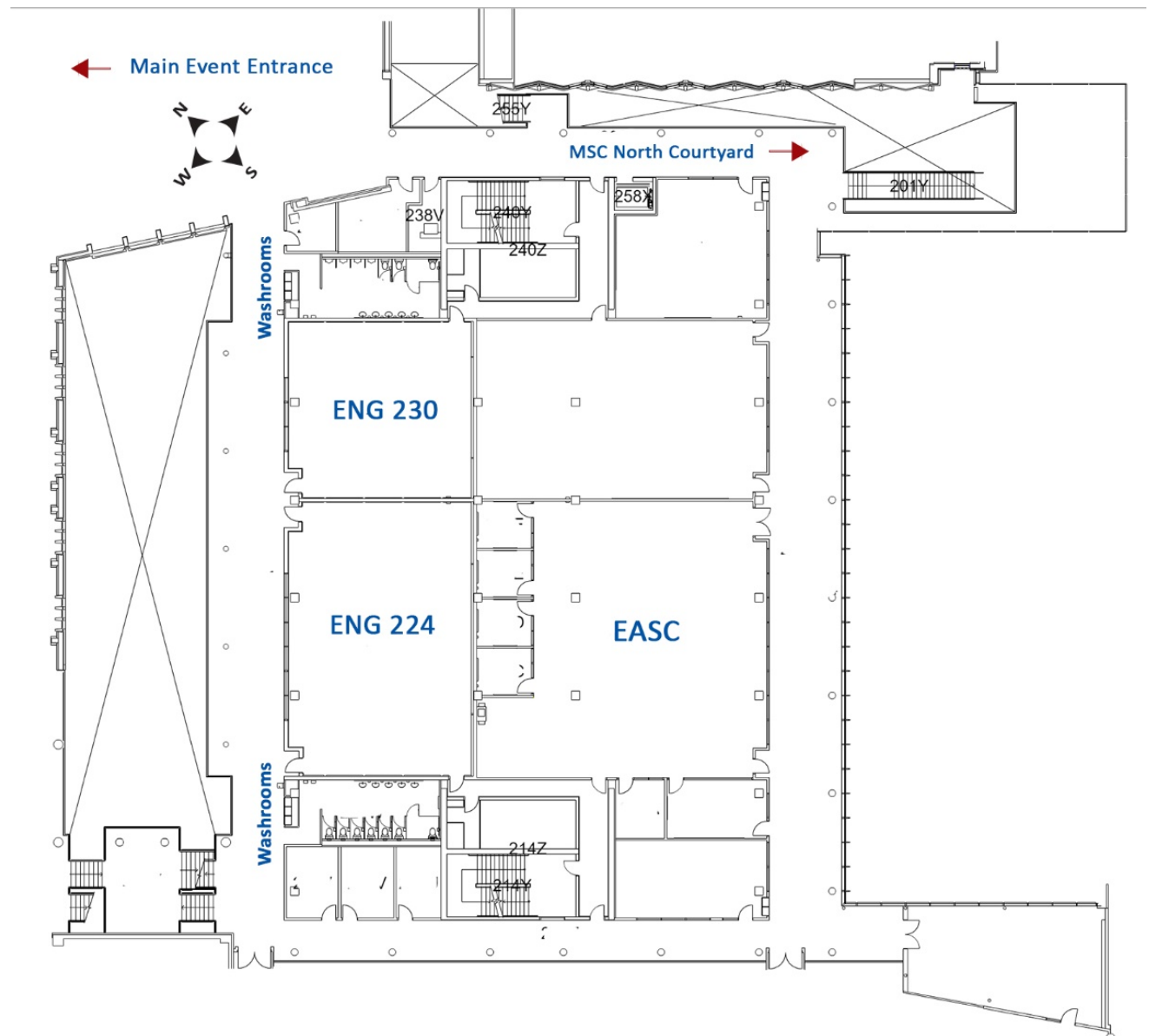
### Silver



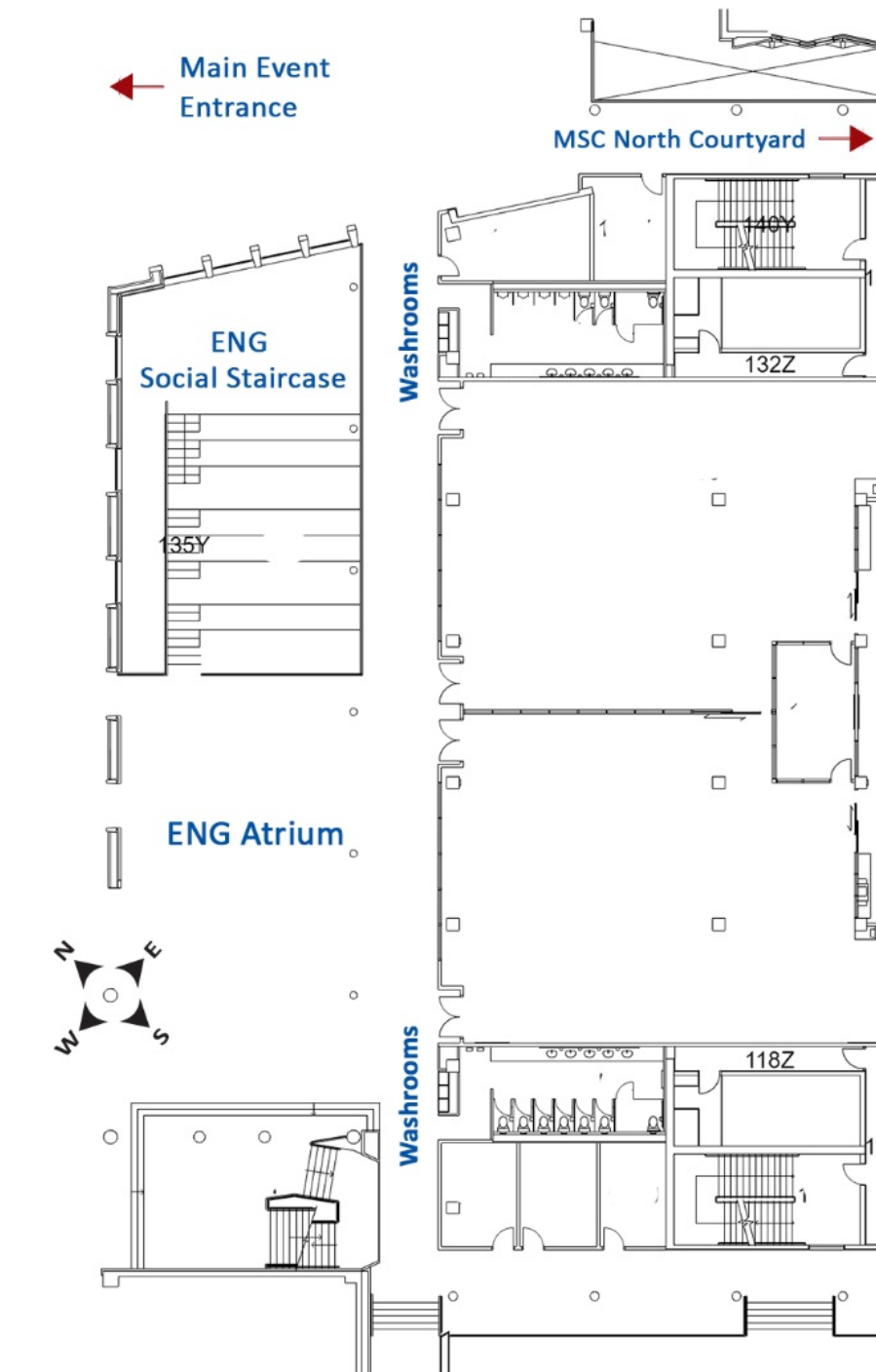
## Engineering C Block – Basement Floor



## Engineering G Block – 2<sup>nd</sup> Floor



## Engineering G Block – 1<sup>st</sup> Floor





# Notice of Filming and Photography

When you enter the GeoDays 2019 events (Canadian Geomatics Engineering Conference, National Geomatics Competition, Geomathon, Geomatics Exposition), you enter an area where photography, audio, and video recording may occur.

By entering the event premises, you consent to interview(s), photography, audio recording, video recording and its/their release, publication, exhibition, or reproduction to be used for news, web casts, promotional purposes, telecasts, advertising, inclusion on websites, social media, or any other purpose by the Department of Geomatics Engineering, Schulich School of Engineering, University of Calgary and its affiliates and representatives. Images, photos and/or videos may be used to promote similar Department of Geomatics Engineering, Schulich School of Engineering, University of Calgary events in the future, highlight the event and exhibit the capabilities of the Department of Geomatics Engineering, Schulich School of Engineering, University of Calgary. You release the Department of Geomatics Engineering, Schulich School of Engineering, University of Calgary, its officers and employees, and each and all persons involved from any liability connected with the taking, recording, digitizing, or publication and use of interviews, photographs, computer images, video and/or or sound recordings.

By entering the event premises, you waive all rights you may have to any claims for payment or royalties in connection with any use, exhibition, streaming, web casting, televising, or other publication of these materials, regardless of the purpose or sponsoring of such use, exhibiting, broadcasting, web casting, or other publication irrespective of whether a fee for admission or sponsorship is charged. You also waive any right to inspect or approve any photo, video, or audio recording taken by the Department of Geomatics Engineering, Schulich School of Engineering, University of Calgary or the person or entity designated to do so by the Department of Geomatics Engineering, Schulich School of Engineering, University of Calgary.

You have been fully informed of your consent, waiver of liability, and release before entering the event.

If you do not wish to be photographed please inform an event organizer.

# Special Events Emergency Instructions



## Building Emergency Response Plan – MAIN CAMPUS & FOOTHILLS

**Building Name:** Engineering Blocks A-C

**Assembly Point:** ICT – Food Court

**Building Name:** Engineering Blocks D-G

**Assembly Point:** MSC North Courtyard

### Evacuation

- Take coat, keys and identification if immediately available
- Evacuate building through the nearest safe exit: use stairs – DO NOT USE ELEVATORS
- Close all doors along your exit route
- Obey all instructions and emergency announcements for specific evacuation instructions
- Move outside, away from the building and proceed to the Assembly Point
- If you have information regarding the emergency, call Campus Security at **403-220-5333** from a safe location
- Do not re-enter the building until you have received the "ALL CLEAR" at the assembly point

### Medical Emergency

- Critical life threatening injury or illness dial 9-1-1
- Non-life threatening injury or illness dial Campus Security at **403-220-5333**
- Advise dispatcher of your location and the nature of the victims' injury or illness
- Unless trained, do not render first aid before trained assistance arrives
- Do not attempt to move a person who is injured or ill unless they are in immediate danger of further injury
- Employees should not transport injured employee to the hospital
- Initiate and complete an OARS report

### Fire

- R- Remove anyone from the immediate danger
- A- Activate nearest emergency pull station
- C- Close all doors to contain smoke and fire (if possible)
- E- Evacuate via your nearest safe exit
- If you have information regarding the emergency call Campus Security at **403-220-5333** from a safe location

### Workplace Violence & Armed Assailant on Campus

- Attempt to distance yourself from the person if possible
- If the person(s) have left the immediate area, lock your door and/or move to a safe place
- Dial 9-1-1 and report all information as soon as safely possible
- Contact Campus Security at **403-220-5333** as soon as possible and follow directions provided
- Be aware of your environment, plan, know your exits, assess the situation, and react quickly
- Choose action over fear while considering the three main options
- Run** - if you are in close proximity to an armed assailant, run away from the subject
- Hide** - if you cannot flee, or do not know the location of the assailant, hide in a locked or barricaded room and turn out the lights
- Fight** - if confronted by the assailant, as a last resort, fight for survival

Improvise weapons to disarm and incapacitate the assailant

### Threatening Calls (Including Bomb Threats)

- Listen and remain calm, do not interrupt the caller
- Record/document as much information as you can while the call is in progress
- Signal someone to call Campus Security at **403-220-5333** or the Police at 9-1-1

### Suspicious Items

- If in doubt of contents DO NOT TOUCH, MOVE, OPEN OR DISTURB THE ITEM
- Clear all personnel from immediate area
- Immediately contact Campus Security at **403-220-5333** or the Police at **9-1-1**
- Wait a safe distance away from the area for Campus Security or emergency services to arrive

### Hazardous Materials Spill

- Do not rush, do not work alone and do not clean up a spill unless you are appropriately trained
- Contact Campus Security at **403-220-5333** in the event of a Major Spill
- Follow the appropriate spill response procedure and complete an OARS report

### Hazardous Materials Decontamination/Exposure

- Follow the appropriate procedures/protocols for Chemical, Biological or Radioactive materials
- Where appropriate, use an emergency eyewash/shower to rinse affected areas for a minimum of (15) minutes. Seek medical assistance immediately after using emergency equipment and complete an OARS report within 24 hours.

### Utility Outage

- Remain calm
- Identify type of utility outage (electrical, heating, cooking, water, etc)
- If possible, call Facilities Customer Care at 403-220-7555 and advise them of your location and nature of problem or Campus Security at 403-220-5333
- Assist other in your immediate work area who may be unfamiliar with the building/workspace
- Stand by for further instructions from Campus Security or Facilities

### Adverse Weather

- Take shelter in a small interior room, closet, hallway (ground floor, if possible) or staircase
- Stay away from outside walls, windows and doors
- Do not use elevators
- Stay away from large unsecured objects and stay close to the ground and protect your head from flying items

### Flood

- If possible, call Facilities Customer Care at **403-220-7555** and advise them of your location and nature of problem or Campus Security at **403-220-5333**

Last Updated: NOV 2018



**\$#%\* happens on campus - Download UC Emergency Mobile**

