ISA SAIT Student Section

Setting the Standard for Automation™

ISA-SAIT

World Student Games

2019

Sponsored by:

ISA Calgary Section

SAIT Main Campus

March 13-16, 2019

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Overview

The **ISA-SAIT World Student Games** (referred to as the Student Games) will be the 7th annual event hosted by the ISA-SAIT Student Section. This year, the event will take place over four days (Wednesday, March 13 to Saturday, March 16).

The purpose of the Student Games is threefold:

1. To provide students with the opportunity to apply their knowledge in practical instrumentation scenarios.
2. To let students to meet, network, and collaborate with other individuals in their field.
3. To have fun!

There is a **Mandatory Orientation** on Thursday, March 14 where teams will be organized and instructions on the event will proceed will be given. The meeting location will be the 2nd floor of the Johnson-Cobbe building in the NE corner (by KA-201). See the Transportation and Directions section for more detailed instructions on how to get there.

On the final day of the event, an awards banquet will be held. We will be hosting a panel discussion attended by reputable executives in the instrumentation world. Each member of the panel will have the chance to talk about a topic of their choosing before the floor is opened to questions from students and faculty. The ISA-SAIT Student Games will conclude by crowning the team that demonstrated the most teamwork, communication, and technical prowess the champions.

Institutions

The following institutions will be attending the Student Games:

- BCIT
- Bellingham Technical College
- Francis Tuttle Technology Center
- ISA District 12 (Spain/Ireland)
- ISA District 14 (India)
- Lambton College
- McMaster University
- NAIT
- Red Deer College
- Red River College
- Saskatchewan Polytechnic
- University of Alberta
- University of Calgary
- University of Houston
- University of Houston Downtown
- Virginia Tech

Team Organization

The Student Games is not intended to be an inter-school competition. Each team will be composed of:

- 1 SAIT student
- 3 students from various other institutions

Each team will attempt to complete six challenges over three days as laid out in the schedule. Teams will be announced at a later date.

Accommodations

Econo Lodge Inn & Suites University
2231 Banff Trail NW
(403) 289-1921

We have booked 1 room for every 2 students, plus a separate room for the faculty advisor.

Parking is available at the Econo Lodge on a first come, first serve basis. We have the majority of the hotel booked, so this shouldn't be an issue.

Meals

Dinner will only be provided on Saturday. You will be responsible for providing dinner on Thursday and Friday. Please contact us immediately if you require assistance regarding this.

SAIT offers several dining locations on campus. For a listing of locations, see:
https://www.sait.ca/about-sait/campus/dining-on-campus
Please take note of their operating hours.

Email us at isa.sait@sait.ca if you have dietary restrictions. We can accommodate your needs but we must be notified in advance.

Breakfast at SAIT will be light (eg. coffee, fruit, muffins). The Econo Lodge offers a complimentary continental breakfast. We suggest you make use of it if you would like a more substantial breakfast.

We will supply the following food over the course of the Student Games:

Wednesday, March 13	Appetizer platters at the Welcome Mixer **Bring Government Issued Photo ID**
Thursday, March 14	Light breakfast Lunch
Friday, March 15	Light breakfast Lunch
Saturday, March 16	Light breakfast Lunch Dinner at the Closing Banquet

Safety and PPE

Please bring the following Personal Protective Equipment with you:

- Safety glasses
- Steel-toed boots or safety shoes

You are expected to wear this equipment in the vast majority of labs. We can provide some safety glasses and steel toe slip-ons if needed, but supplies are limited.

Transportation and Directions

To/From the Airport

We will not be providing transportation to and from the airport.

You are responsible for arranging transportation to and from the airport. The most economical option is Uber:

https://www.uber.com/en-CA/airports/yyc/

An UberXL (maximum 6 riders) to the hotel should cost $40-60 CAD in total.

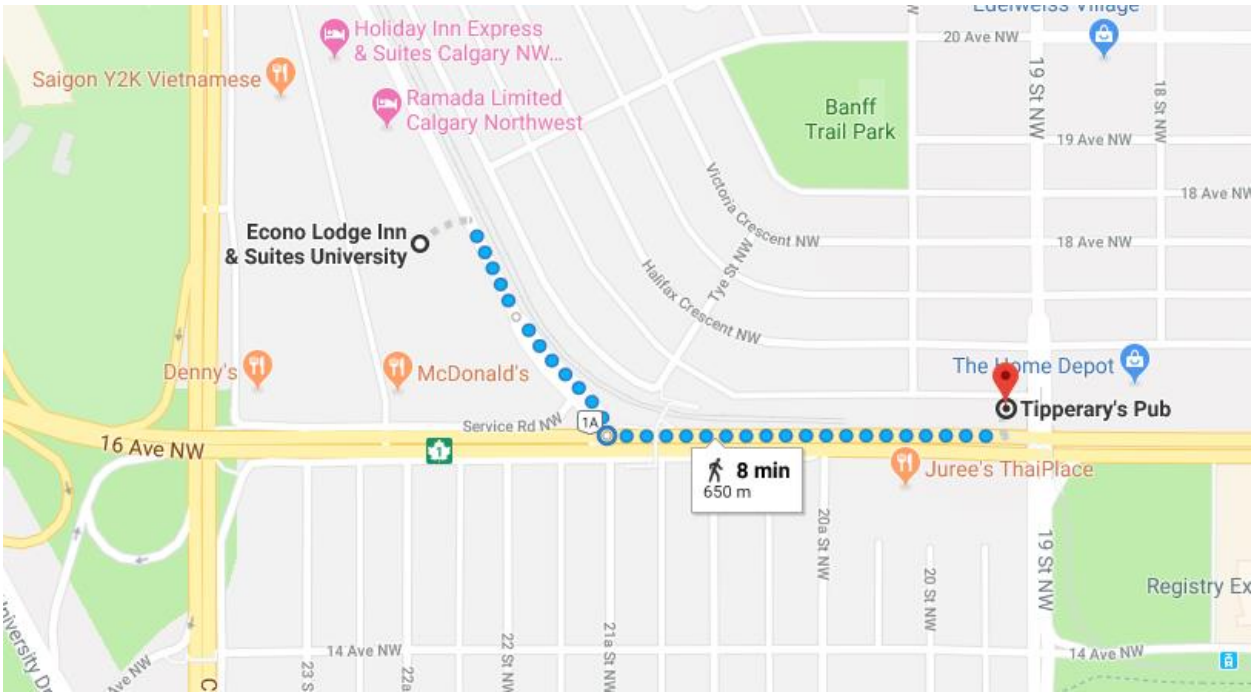
For smaller groups, UberX to the hotel will cost roughly $30 CAD.

To/From Tipperary's Pub

The Welcome Mixer is being held at Tipperary's Pub. It is within walking distance of the Econo Lodge.

You must bring Government Issued Photo ID to the pub to get in.

Passports will work if you have no other ID.



The address for Tipperary's Pub is 2002 16 Ave NW.

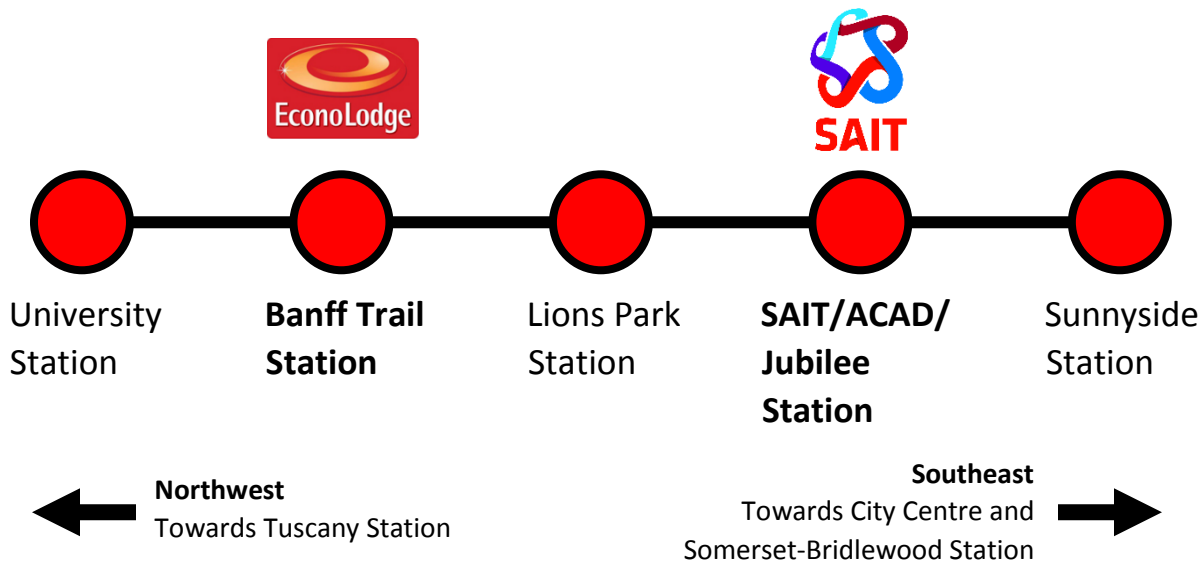
To/From SAIT

Use Calgary Transit. We will provide you with books of tickets upon arrival at the hotel. Before boarding a train, validate your tickets at one of the following machines:

Insert your ticket into the **purple box** on the left to validate it. **Each ticket is good for 90 minutes from the time of validation.**

Please return any unused tickets to us at the conclusion of the Student Games.

Simplified C-Train Map



Navigating SAIT

All tasks will take place in the Johnson-Cobbe building (marked K or KA on the SAIT Campus Map).

The first digit of the room number denotes the floor. For instance:

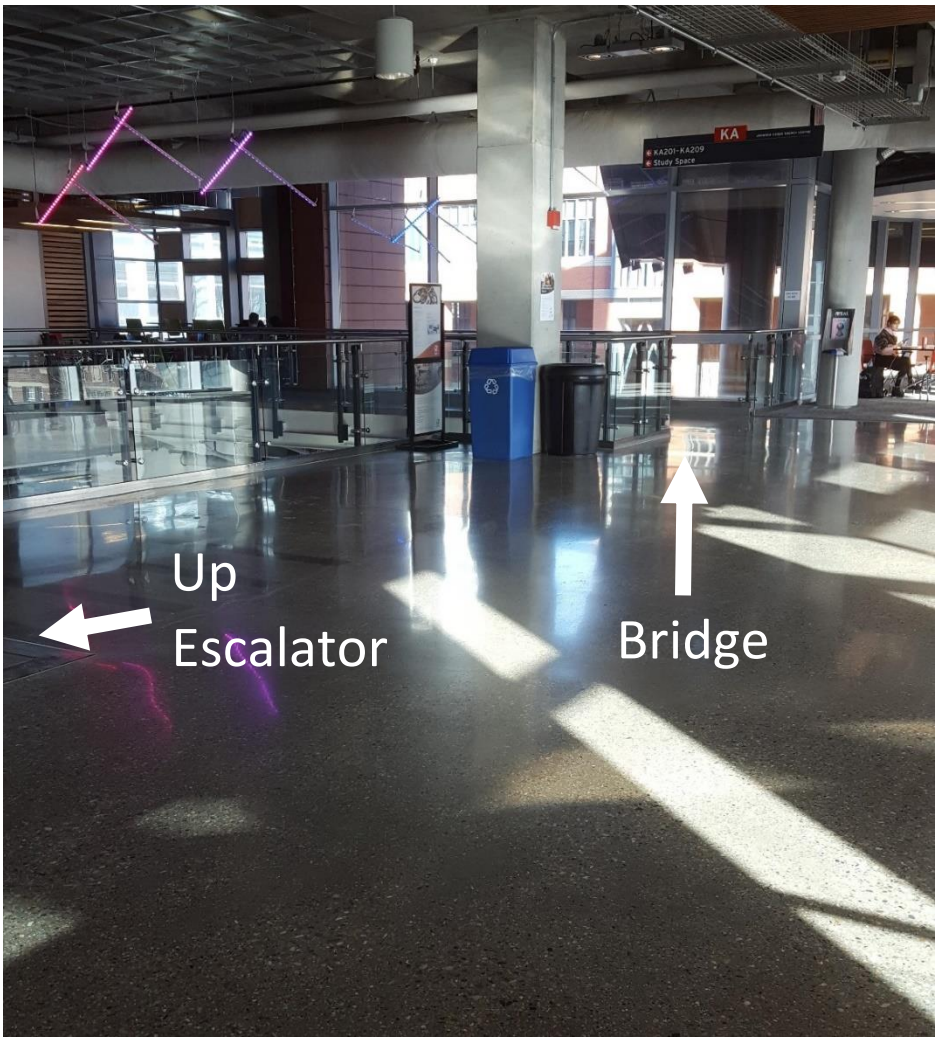
- KA-001 is in the basement of the building
- KA-101 is on the main floor
- KA-201 is on the second floor

The overhead signs will help you find the room you're looking for.

Breakfast/Lunch Area

The gathering area for breakfast and lunch is located on the **second floor** of the Johnson-Cobbe building on the North side of the building (facing the Stan Grad building). It is by room **KA-201**.

Cross the bridge shown below:



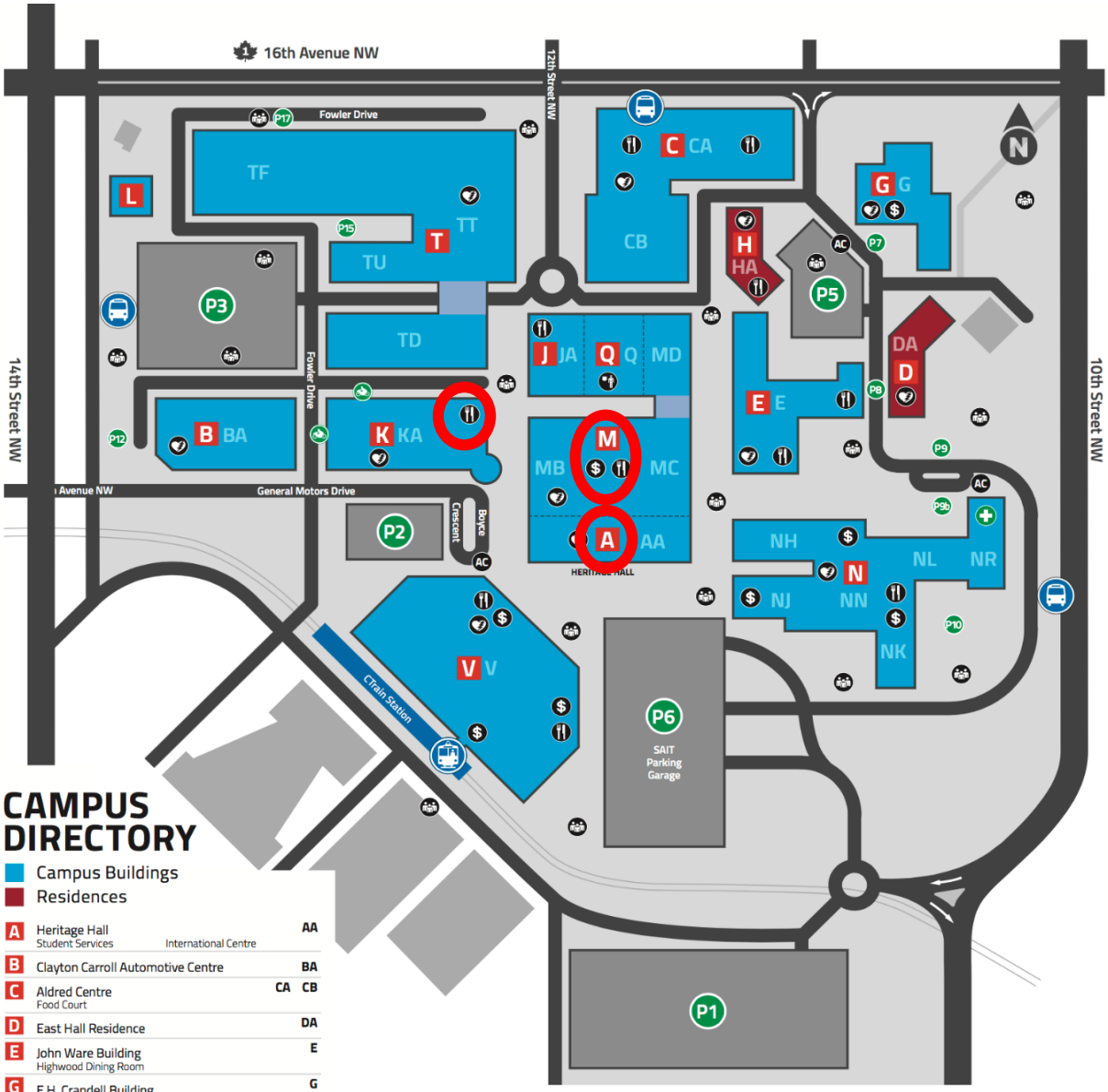
MacDonald Hall

MacDonald Hall is on the main floor of Heritage Hall, which is attached to the Stan Grad building.

Enter through the doors closest to this statue:

Continue walking down the hallway until you reach an open area (the foyer). Macdonald Hall will be on your right.

SAIT Campus Map



CAMPUS DIRECTORY

Campus Buildings
Residences

A	Heritage Hall Student Services International Centre	AA
B	Clayton Carroll Automotive Centre	BA
C	Aldred Centre Food Court	CA CB
D	East Hall Residence	DA
E	John Ware Building Highwood Dining Room	E
G	E.H. Crandell Building XDocs ATB Financial	G
H	Begin Tower Residence	HA
J	Cenovus Energy Centre	JA
K	Johnson-Cobbe Energy Centre Food Court	KA
L	Green Building Technologies (GBT) Lab and Demonstration Centre	L
M	Stan Grad Centre Bookstore Library Food Court	MB MC MD
N	Senator Burns Building Chinook Lodge Aboriginal Centre Food Court	NH NJ NK NL NN NR
Q	Eugene Coste Building Security Office	Q
T	Thomas Riley Building Shipping and Receiving	TD TF TT TU
V	Campus Centre Gym Arena Orpheus Theatre Parking Services Athletics and Recreation Students Association (SAITSA) Food Court Pool	V

LEGEND

- Bus Stop
- CTrain
- Parking
- Motorcycle Parking
- Food Court
- ATM
- Access Calgary Loading Zone
- Health Services
- Security Office
- AED (Automated External Defibrillator)
- Muster Point

Breakfast/Lunch – Mar 14-16
Johnson-Cobbe (KA)
NE corner of the 2nd Floor

Panel discussion – Mar 16
Heritage Hall (A)
Macdonald Hall

Closing banquet – Mar 16
Stan Grad Centre (M)
Atrium

SAIT

Schedule

Wednesday, March 13th, 2019	
6:00 PM	Welcome Mixer *Tipperary's Pub, 2002 16 Ave NW* **Bring Government Issued Photo ID**
Thursday, March 14th, 2019	
8:00 - 9:00 AM	Light breakfast and **Mandatory Orientation** *2nd floor Johnson-Cobbe, NE corner (by KA-201)*
9:00 - 12:00 AM	**1st Challenge**
12:00 – 1:00 PM	Lunch *2nd floor Johnson-Cobbe, NE corner (by KA-201)*
1:00 - 2:30 PM	Lunch & learn sessions
2:45 - 5:45 PM	**2nd Challenge**
Friday, March 15th, 2019	
8:00 - 9:00 AM	Light breakfast *2nd floor Johnson-Cobbe, NE corner (by KA-201)*
9:00 - 12:00 AM	**3rd Challenge**
12:00 – 1:00 PM	Lunch *2nd floor Johnson-Cobbe, NE corner (by KA-201)*
1:00 - 2:30 PM	Lunch & learn sessions
2:45 - 5:45 PM	**4th Challenge**
Saturday, March 16th, 2019	
8:00 - 9:00 AM	Light breakfast *2nd floor Johnson-Cobbe, NE corner (by KA-201)*
9:00 - 12:00 AM	**5th Challenge**
12:00 – 1:00 PM	Lunch *2nd floor Johnson-Cobbe, NE corner (by KA-201)*
1:00 - 4:00 PM	**6th Challenge**
5:00 - 6:15 PM	Panel Discussion and Awards *Macdonald Hall*
6:15 - 7:15 PM	Closing banquet *Stan Grad Atrium*

Challenges

Challenges form the core of the Student Games. They are intended to test students on various principles of instrumentation.

Each challenge is managed by an instructor and several student volunteers. **Student volunteers can be identified by their red shirts.**

Each challenge is three hours long. Several challenges are split into four smaller subtasks – teams will rotate around these stations over the three-hour period.

Teams will be marked based on their technical prowess, teamwork/communication, and ability to fulfill the challenge's goal. The Student Games are meant to be an opportunity to learn – don't be afraid to ask for help! However, as this is a competition, marks will be docked at the discretion of your judge.

Analyzers (Analyzer Lab, KA-225)

SAIT Staff: Dale Divel
External Help: Brandon Fraser
Student Volunteers: Matthew Steele, Katlyn Farness, Jessica Ward, Kanvua Kelkar

Students will be stationed in the analyzer lab, where analyzers of all shapes, styles, and function are found. In completing these tasks, students will be tested on their ability to:

- Read and understand manufacturer documentation regarding specifications, verification and calibration procedures, and troubleshooting tips
- Demonstrate knowledge of basic physics and chemistry, including:
  - Behavior of light
  - Absorption and adsorption principles
- Understand the principle of operation of optical, dew point and chromatographic analyzers

Device Maintenance (Flow Lab, KA-123)

SAIT Staff: Alex Shtraer
External Help: Antuaneth Rodriguez
Student Volunteers: Sakaria Indongo, Rushi Raval, Pratik Acharya, Vrutant Patel, Olinke, Afolabi, Russel Goodkin

The Device Maintenance task is composed of four smaller sub-tasks. Each team will rotate around the four stations over the course of three hours. In completing these tasks, students will be tested on their ability to:

- Observe proper safety procedures when dealing with real process equipment
- Establish communications with transmitters using a HART communicator
- Diagnose and fix devices to make them operate as expected
- Demonstrate knowledge of basic level measurement principles

Distributed Control Systems (DCS Lab, KA-127)

SAIT Staff: Mark Tarrant
Student Volunteers: Hsuan-Han (Sam) Liu, Nicholas Amaraibi

Students will be provided with a physical simulation of a tank system, complete with functioning instrumentation and connected to a DeltaV DCS. In completing this task, students will be tested on their ability to:

- Read and interpret instrumentation drawings
- Create Function Block Diagrams to implement the logic for the tank system
- Tune the loop using DeltaV software
- Commission the entire system to confirm correct operation

Loop Tuning (Process Lab, KA-112)

SAIT Staff: Viero DiGregorio, Keith Moore
Student Volunteers: Alan Paterson, Kyle Lychuk

Students will be provided with a physical simulation of a simple tank system. In completing this task, students will be tested on their ability to:

- Establish communications with a Siemens 353 controller
- Properly configure the controller for cascade operation
- Demonstrate knowledge of basic tuning principles
- Manually tune the loop such that the process value reaches steady state in a reasonable timeframe

MacGyver (Maintenance Lab, KA-125)

SAIT Staff: Dennis Lidfors, Keith Moore
External Help: Jesse Coleman, Craig Mackenzie
Student Volunteers: Sanjay Vaswani, Prasanth Patel

Students will be provided with a valve. In completing this task, students will be tested on their ability to:

- Observe safety procedures complete with requisite forms and documentation
- Create a rectifier circuit
- Bend and attach tubing to connect the valve to its air supply
- Properly configure and range the valve

SCADAPack (Data Dungeon, KA-016)

SAIT Staff: Nazeer Ahmed
External Help: Mark Phillips, Lee Cysouw
Student Volunteers: Daniel Brooks, Zachary Piette, Wang Zhe Xu, Reggie Rosalejos

Students will be provided with a SCADAPack RTU, a wireless temperature transmitter, a wireless base station, and a pair of wireless Ethernet radios. In completing this task, students will be tested on their ability to:

- Establish wireless communications from the transmitter to the base station
- Establish a wired serial connection between the base station and the RTU
- Program the RTU using Ladder Logic
- Transmit the data from the RTU to a computer using the wireless Ethernet radios

Lunch & Learns

Lunch & Learns run on Thursday and Friday. These sessions serve as an opportunity for students to see more of what SAIT has to offer, and possibly learn new things. Sign-ups will be at breakfast and lunch.

The meeting place for each of these lunch & learns will be the lunch area (2nd Floor Johnson-Cobbe, NE corner by KA-201).

Each Lunch & Learn runs for an hour and a half.

Modbus TCP/RTU (DCS Lab, KA-127)

Presenter: Marissa Dumonceaux

Students will have the chance to connect to and control a VFD using either Modbus TCP or Modbus RTU. Each protocol comes with its own challenges. By the end of the session, students should have a greater understanding of how Modbus protocol works, and the structure of command words as used in instrumentation.

Maximum 16 students for TCP and 16 students for RTU

Cenovus Energy Centre Tour (JA)

Presenter: Mitch McNeil

Students will tour the Cenovus Energy Centre located on the SAIT Main Campus. Highlights of the tour include:

- Various boilers and hot water heaters
- HVAC systems
- A distillation column
- An amine gas sweetening tower

Maximum 16 students
Bring your PPE for this tour

Distillation Column Demonstration (KA-110)

Presenter: Kai Chan

Students will be shown the distillation column located in the Johnson-Cobbe Building. Although the Cenovus tour also includes a distillation column, this demonstration will go much more in-depth as to its operation.

Maximum 16 students
Bring your PPE for this demonstration

ISA-SAIT Student Section Executive

The following individuals are members of the ISA-SAIT Student Section executive board. Please contact one of them if you have any questions regarding the Student Games.

Jonathan Ma	President	jonathan.ma@edu.sait.ca
Darcy Hilts	Vice President	darcy.hilts@edu.sait.ca
Jason Kee	Treasurer	jason.kee@edu.sait.ca
Ethan Lukkar	Communications Manager	ethan.lukkar@edu.sait.ca
James Olabode	Membership Director	james.olabode@edu.sait.ca
Drew Chorney	Program Director	drew.chroney@edu.sait.ca
Jeff Gross	Graphics Designer	jeff.gross@edu.sait.ca
Braedon Green	Webmaster	braedon.green@edu.sait.ca
Connor Killoran	2nd Vice President	connor.killoran@edu.sait.ca
Matthew Steele	Secretary	matthew.steele@edu.sait.ca
Alan Paterson	Assistant Treasurer	alan.paterson@edu.sait.ca
Kanvua Kelkar	Assistant Communications Manager	kanvua.kelkar@edu.sait.ca
Sakaria Indongo	Assistant Membership Director	sakaria.indongo@edu.sait.ca
Hsuan-Han Liu	Assistant Program Director	hsuan-han.liu@edu.sait.ca
Daniel Brooks	Assistant Graphics Designer	daniel.brooks@edu.sait.ca
Sanjay Vaswani	Assistant Webmaster	sanjay.vaswani@edu.sait.ca