CHEM-E 101:

Introduction to UBC Chem-E-Car

UBC Chem-E-Car | Engineering Design Team
The University of British Columbia, Vancouver

WWW.UBCCHEMECAR.COM

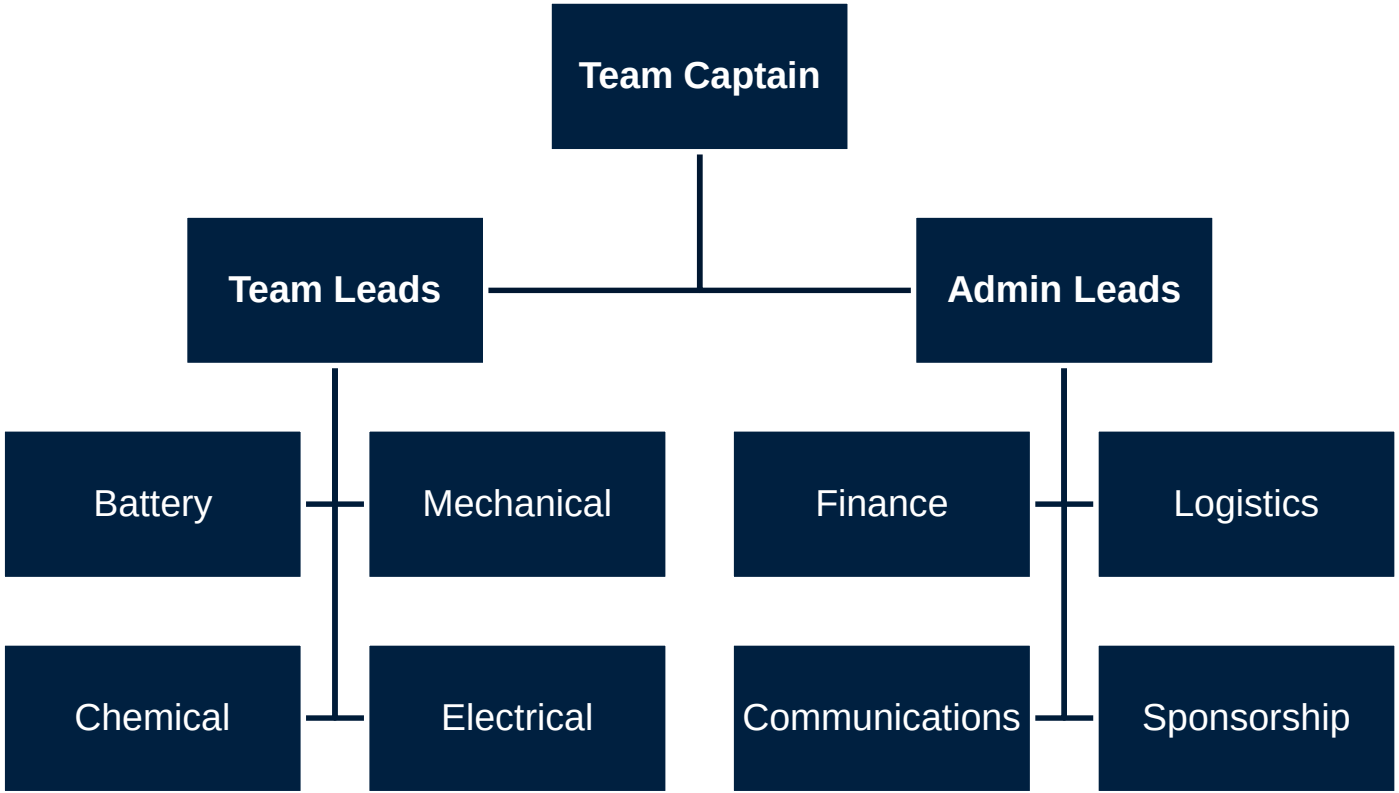
ABOUT US

- Engineering Design Team, founded 2008 (only ~5-7 members per year until team expansion in 2015)
- Projects focused on chemical engineering, emphasis on electrochemistry and energy
- **2016-2017** three main projects: Chem-E-Car, Zinc-Nickel Flow Cell, AIChE App Development (Potentiostat)
- Very active in public outreach
- Diverse and enthusiastic team

WHAT'S A CHEM-E-CAR?

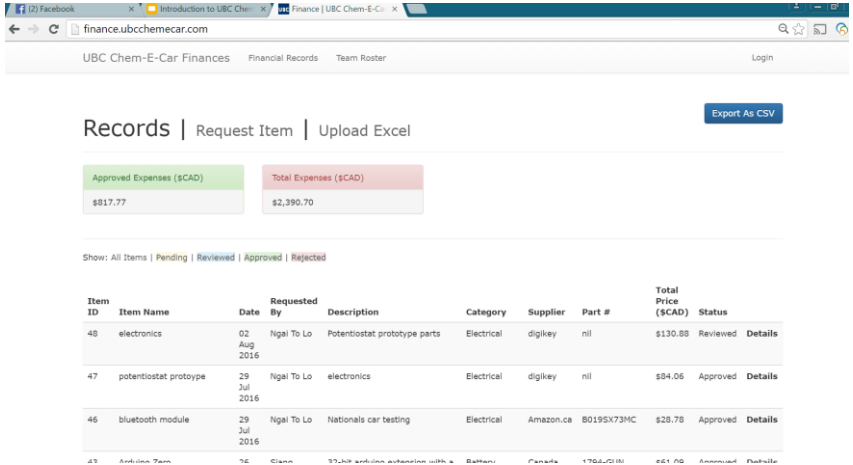
- Main Team Project
- Compete annually in AIChe Chem-E-Car Regional and National Competitions
- Chemically powered and timed model vehicle

TEAM STRUCTURE



ADMINISTRATION TEAM

- Handles day-to-day operations for the team/project management
- Manages funds and logistics
- Responsible for sponsorship
- Updates websites, social media
- Communications and outreach



Skills you'll learn:

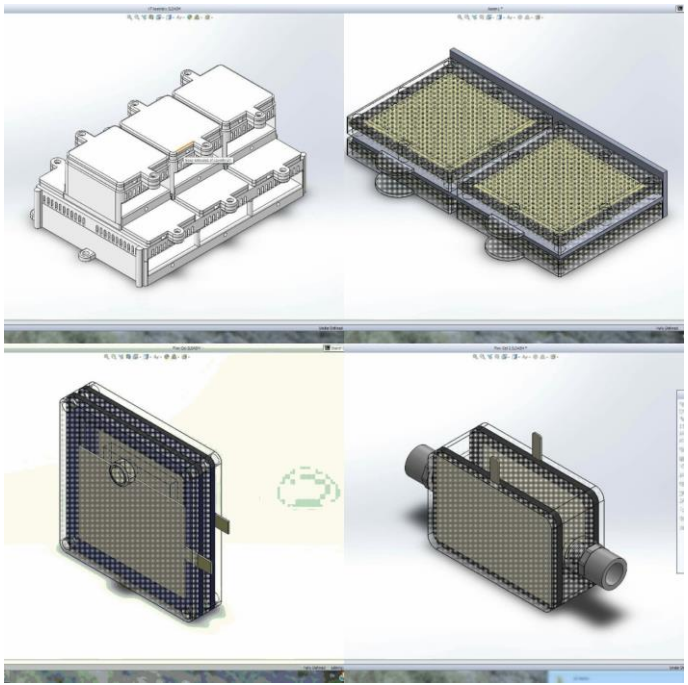
Project management, fundraising and communications, software and web development

BATTERY

- Develops and tests battery chemistry
- Designs casing for battery systems in tandem with mechanical team

Skills you'll learn:

Electrochemistry (very useful for battery/fuel cell co-ops i.e. AFCC, Ballard), drafting/CAD, research, experiment design



MECHANICAL

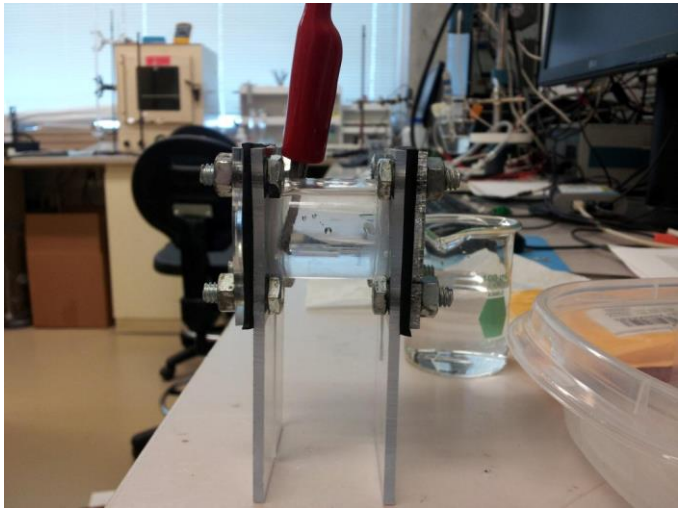
- Develops vehicle and all associated moving parts
- Works with battery and chemical to develop respective casings

Skills you'll learn:

Mechanical design, drafting/CAD, 3D printing, heavy machinery (CNC machine etc)

CHEMICAL

- Develops chemical reaction for timing mechanism
- Requires numerous tests to ensure optimum accuracy
- Designs casing with integrated sensors with mechanical and electrical team



Skills you'll learn:

Experiment design, wet lab skills, lab safety, literature review and research

ELECTRICAL

- Builds electrical systems for starting/stopping car, and managing sensors / data collection

- Creates software to run electrical systems and the vehicle

Skills you'll learn:

Circuit design and analysis, Arduino, coding/programming

PROJECT #2: ZINC-NICKEL FLOW CELL

- Experimental rechargeable battery system
- Designed to hook up to Solar Powered Energy grid
- Currently in Front End Design Phase
- Arjun and Andy will speak more about this later

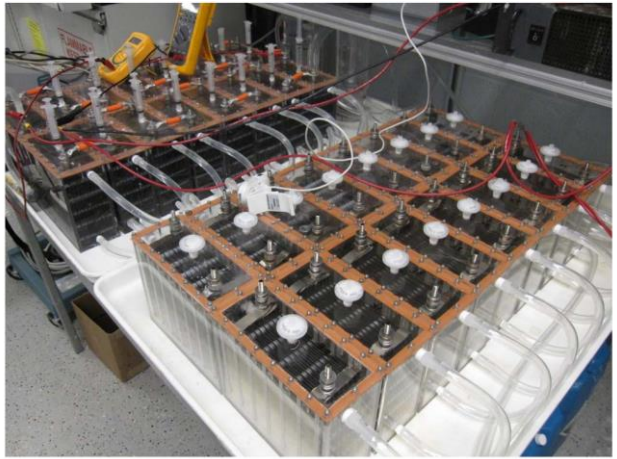


Figure Credits: City University of New York (CUNY)

GENERATE 2016 CONFERENCE

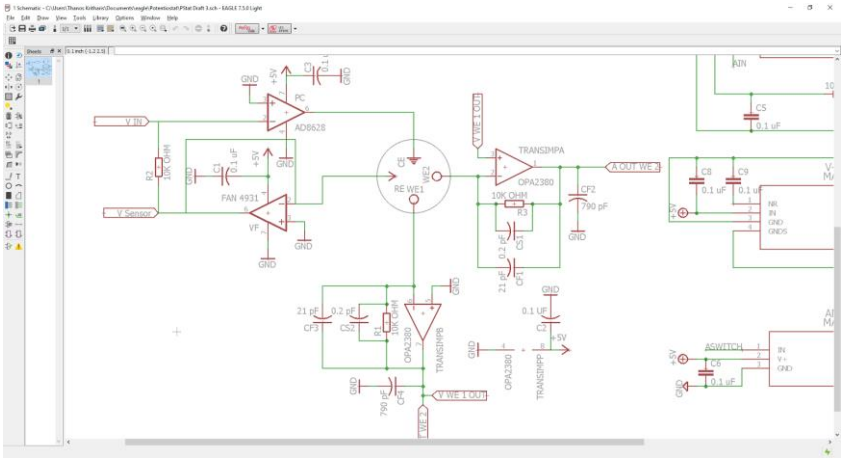
Student poster competition on energy-related projects

Why join?

- Network with industry and future employers
- Cash prizes and free conference ticket + good food
- Potential co-op and internship offers (BC LNG competition)

PROJECT #3: AICHE APP PROJECT

- Building a DIY potentiostat - hardware/software integrated project
- **Potentiostat:** device for electroanalytical experiments
- Used for investigating reaction mechanisms, catalyst activity, wastewater analysis etc



BENEFITS

- Technical Skill development: machining, chemistry, CAD design, etc.
- Professional Skill development: administration, leadership, teamwork, etc.
- Formal safety training
- Access and participation to professional development events
- Exposure to professional engineering society through conferences and competitions

HOUSE RULES

- We want enthusiastic and self-motivated students that can work very independently under minimal supervision and instruction (good problem solving and research skills!).

- At least 2 hours a week involvement in development, research, or administration. More during testing/construction period, less during exams.

- Ultimately, what you get out of the team is what you put in. Opportunities and resources are always available. (At least $60k funding secured for next 3 years, $20k per year by our sponsorship team, strong CHBE department support).

REQUIREMENTS

- Printed RMS safety certificate, Introduction to Chemical Safety, Chem-E-Car Safety certificate, RMS WHMIS certificate, and RMS Bullying and Harassment
  Links available on our website

- Register as AIChE Student Member (free, sign up online) - bring proof of registration

- Don’t forget to like us on Facebook and Instagram! (Important for sponsorship and funding purposes, **DO IT RIGHT NOW: UBC CHEM-E-CAR, @UBCCHEMECAR)**

Q/A SESSION

Thank you!


a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA
THE UNIVERSITY OF BRITISH