WIL@Western: Mining Undergraduate Talent

Showcasing the MiHR Gearing Up Program

Felix Lee, Shayna Kay, Carmen Venier, and Jenna Veugen (Integrated Science)

Jennifer Wright (MiHR)
The Showcase...

1. MiHR and Gearing Up (Jennifer Wright)
2. Integrated Science Program (Felix Lee)
3. Project Management (Carmen Venier)
4. Student Project (Shayna Kay)
5. Student Project (Carmen Venier)
6. Moving Forward: Expanding WIL (Jenna Veugen)
About MiHR

- National HR Council for the minerals and metals industry.

What we do:
- Identify national HR challenges and opportunities for the minerals and metals industry.
- Create national solutions through collaboration, partnerships and synergy with stakeholders.
Labour Market Challenges

- Mining is volatile, leading to labour supply/demand imbalances
- Aging labour force (50k+ workers retiring)
- Need to recruit the next generation of workers (up to 130,00 new hires in 10 years)
- Hiring challenge is intensified by a tight labour market:
  - Rural and remote location of mines
  - Challenges with attracting / retaining women and new Canadians
  - Historically low unemployment in mining
  - Youth continue to hold negative perceptions of the sector
  - PSE students struggle to find co-ops / work-integrated learning
MiHR Priority: Increase Worker Supply

1. Canadian Mining Certification Program (CMCP)
2. Gearing Up Program
3. Gender Equity in Mining Works (GEM Works)
4. Green Jobs Program
5. Mining Essentials (ME)
6. Mining Professional Immigrant Network (M-PIN)
Objective: To change the way students **perceive, pursue and acquire** the skills needed for in-demand careers in the mining sector.
Gearing Up

• MiHR has secured 7.8 Million dollars for the Gearing-Up project
• Provide a wage subsidy to employers who create NEW WIL opportunities (target of 850) in mining:
  • Up to $5,000, or 50% of the wages, for regular 2\textsuperscript{nd} year students and above
  • Up to $7,000, or 70% of the wages, for under-represented students (women, Indigenous peoples, new Canadians, 1\textsuperscript{st} year students)
• Subsidies available for students in STEM or Business programs
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Integrated Science Program (WISc)

- Honours Integrated Science with a chosen discipline
  - Biology
  - Chemistry
  - Computer Science
  - Earth Sciences
  - Environmental Science
  - Genetics
  - Mathematics
  - Physics / Astrophysics

Western Science
Student Goals

- Acquire a broad understanding of science in general, plus discipline-specific skills
- Appreciate the sciences generally “forgotten” by year-1 students
- Make connections between the different sciences
- Develop and refine professional skills
# Program Structure

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<th>Year-1</th>
<th>Years 2, 3, and 4</th>
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<td>Courses from chosen discipline</td>
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WISc and MiHR
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Team Working Environment

Scrum Roles
- Product Owner
- Associates
- Scrum Master

Scrum Principles
- Sprints
- Deliverables
- Daily Standups
Team Working Environment

**Trello**

**Slack**
Invisible Golddiggers: The First 24 Hours

**Micro-Sprint**: 18 hours from team creation to first deliverable!
Invisible Golddiggers: Tasks and Productivity

**Sprint 3:** (2 weeks)
- Company data processing
- SOP for data processing method

**Sprint 4:** (2 weeks)
- Brochure for gold information
- Poster for synchrotron use in mining
Summary: What Works?

- Flexible Schedules
- Self-Direction
- Daily Check-Ins
- To-Do Lists
- Collaboration
- Support

PRODUCTIVITY
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METALS IN SOILS

Anthropogenic Sources in Kamloops, British Columbia

Shayna Kay
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LITHIUM PEGMATITES
An alternative resource for clean energy storage
Carmen Venier
Where do we get our lithium from?

Location of major lithium pegmatite (square) and brine (cross) deposits. Source: Kesler, S. E., et al. (2012).
Transition metals in pegmatites

- Iron
- Cobalt
- Copper
- Manganese
- Nickel
- Magnesium

Lithium pegmatite from Potax Property in Quebec
Source: http://strialithium.com/pontax-lithiumquebec/
Collecting the Data
XANES Data

Fe$_2$O$_3$ with two energy peaks at 53.7 eV and 58.1 eV, indicating the presence of iron in the sample
CoO with two energy peaks at 58.5 eV and 62 eV, indicating the presence of cobalt in the sample
XRF Analysis
XRD Analysis

Graph showing X-ray diffraction analysis with peaks at various 2Theta values, labeled with different materials. Notations include various codes and descriptions.
Summary of Skills Acquired

- Remote data collection using a synchrotron
- XANES, XRF, and XRD analysis
- Use of software for data analysis
- Project management
- Report writing
- Presentation skills
- Teamwork
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EXPANDING WORK INTEGRATED LEARNING AT WESTERN
Work-Integrated Learning Student Challenge

- Small, multidisciplinary student teams
- Create solutions to real-world mining problems
- Develop skills in:
  - Strategic thinking
  - Problem solving
  - Teamwork