

# Computer Modeling of Pipeline Welding

## PROJECT DESCRIPTION

"This project consists on using the finite-element software Simufact to model the residual stresses and strains during the welding of pipeline, especially considering the case when the joint is not perfect, but misaligned. This is a project of much industrial interest because of its direct and very important implications for pipeline integrity.

In this project students will learn the basics of welding, heat transfer during welding, elastic-plastic solid mechanics associated with welding, finite-element modeling, and will also be exposed to the real welding operations and testing equipment available at the lab. Possible confirmation of modeling can include the use of a latest-generation thermal camera.

Required skills for this project include having passed an introduction to heat transfer, introduction to mechanics of materials (strength of materials or solid mechanics), basic use of Microsoft Excel, and general computer proficiency, self-motivation, natural curiosity, patience, and ability to act on feedback from the supervisor.

Desirable skills for this project include the ability to write code (e.g. Matlab), previous experience on heat transfer or solid mechanics."

## FACULTY-DEPARTMENT

Engineering - Chemical and Material Engineering

## DESIRED FIELD OF (STUDENT) STUDY

Chemical Engineering, Mechanical Engineering, Materials Engineering, Mathematics, Physics, Computer Science or Engineering. Other fields welcome

## INTERNSHIP LOCATION

University of Alberta Main Campus - Edmonton

## NUMBER OF INTERNSHIP POSITIONS

1

## INTERNSHIP START DATE

July 4

Contact: Brendan Cavanagh, Internship Coordinator (Inbound)  
University of Alberta International  
intern@ualberta.ca

## INTERNSHIP END DATE

3 months after start date

## ARE THE DATES FLEXIBLE?

Yes, I am flexible regarding the internship dates. Selected students can contact me to request a date change.