









01225GLOBAL ENGINEERS PROGRAM

Research Internships for undergraduate and graduate students







For more than 100 years, we have believed that the role of engineering and technology-based sciences must respond to the needs of the national productive sector. For this reason, the Faculty of Engineering of the Universidad de Santiago de Chile (USACH) is a pioneer in contributing to the country's industrial development. With 14 engineering specialization areas in undergraduate and graduate programs, research centers, and high-tech laboratories, our faculty is committed to creating a positive impact on Chilean society and in the region, through technological innovation, applied research, entrepreneurship, and technology transfer. At USACH we understand that a globalized world requires a multidisciplinary approach to address modern-day problems. In that sense, we are certain that connecting foreign students with national institutions and local laboratories will prepare them to acquire good operating practices in the Latin-American engineering field, as well as our faculty obtains new knowledge and perspective of international human capital.



CIVIL **ENGINEERING** DEPARTMENT https://obrasciviles.usach.cl/ 🔆

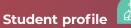


Sanitary Engineering Laboratory Fields of study: water sciences and technology

This laboratory shares teaching and research activities. The Research Group, Ko-Yaku, who is dedicated to water technology and sciences, works in four areas: environmental matrices, treatment technology development, water, waste, and subproducts revaluation, and indicators management. More information in https://koyaku.usach.cl/



Develop analytical techniques for GC FID. The student should be capable of elaborating a protocol for using a gas chromatographer, developing techniques to define contaminants in solid and liquid environmental samples, and supporting any other tasks in the lab.



This internship is aimed at Ph.D. students from civil engineering, environmental chemical engineering, engineering, bioengineering, sustainable engineering, or any other similar discipline. Students need to have analytical competencies in water quality and basic knowledge of chromatography.

English, Spanish and Portuguese Languages are accepted.



Six months.

40 hours per week.



Possibility to participate in the elaboration of a scientific research paper.

Possibility to participate in academic events. Lunch tickets for university dining.

Supervisor

Dr. Cristina Villamar, Faculty Member of the Department of Civil Engineering



Sanitary Engineering Laboratory Fields of study: civil engineering

This laboratory shares teaching and research activity. The research group, Ko-Yaku, who is dedicated to water technology and sciences, works in four areas: environmental matrices, treatment technology development, water, waste, and subproducts revaluation, and indicators management. More information in https://koyaku.usach.cl/



task

Test materials for pollutants adsorption. The student should be capable of developing adsorption tests and monitoring the pollutants in filter systems.

Student profile



This internship is aimed at Ph.D. students from chemical engineering, environmental engineering, civil engineering, bioengineering, biochemistry, chemistry, or any other similar discipline. Students need to have analytical competences in adsorption tests.

English, Spanish and Portuguese Languages are accepted.



40 hrs. per week

The length of time will be determined by the supervisor and intern.





Possibility to participate in the elaboration of a scientific research paper.

Lunch tickets for university dining.



Dr. Cristina Villamar, Faculty Member of the Department of Civil Engineering



MINING **ENGINEERING** DEPARTMENT

https://dim.usach.cl/ 🖄

Fields of study: rock mechanics

The Laboratory of Rock Mechanics is equipped to develop rock sample analysis for the mining industry and other laboratories in Chile. All rock tests are based on ASTM and ISRM standards.





Classification and tests development of the index properties of rocks. The task could vary according to the supervisor's needs and prior agreement with the intern.



This internship is aimed at undergraduate students from geology, mining engineering, civil engineering, or similar discipline. Knowledge about geology or material resistance is required.

Spanish and English languages are accepted.

Check out a previuos experience in the lab here:







30 hrs. per week

The length of time will be determined by the supervisor and the intern.



Flextime.

Lunch tickets for university dining.

A small stipend could be given according to the intern's job performance.

Supervisor



Mr. Miguel Vera. Faculty member Department of Mining Engineering.



Analogue Models Laboratory

Fields of study: structural geology, and analogue modeling of deformation

In this lab, researchers are able to analyze the mechanical response of analogue materials by simplifying the rheological properties of the rocks found in nature, as well as the evolution scale (time and size) of deformation. The lab includes a modeling board, a motor-drive that controls different variables of each study case, and data acquisition systems, among other materials.

Main task 🚽

Design and develop analogue models.

For this, students will need to develop the following specific tasks:

• Literature research according to the study case (it is recommended to have at least one virtual meeting before the internship for objectives definition)

• Analyze the scales and design (set-up) of the analogue modeling of a project to be defined (2-3 weeks)

• Develop two or three analogue modeling of a study case (3-4 weeks including data collection). The supervisor will support this task.

· Data analysis –like pictures– (2-3 weeks)

• Support for the elaboration of an abstract with the results that will be presented at the XVI Congreso Geológico Chileno (2-3 weeks)



This internship is aimed at undergraduate and master's level

students from geology, or similar disciplines. The competencies of the intern should include structural geology skills (macroscopic, regional geology, structural analysis at lithosphere or outcrop scale) and knowledge of geometry, physics, and mechanics for modeling design. Previous experience in analogue modeling of deformation is advisable.

Spanish and English languages are accepted.



Three months is desirable.

Working hours will be determined by the supervisor and intern.

Benefits

Flextime.

After the internship, the student may participate in the elaboration of a scientific research paper, according to the job performance.

Lunch tickets for university dining.

Supervisor

Dr. Pamela Jara. Faculty member of the Department of Mining



Analogue Models Laboratory Fields of study: structural geology, geotechnics, and mechanics.

In this lab, researchers are able to analyze the mechanical response of analogue materials by simplifying the rheological properties of the rocks found in nature, as well as the evolution scale (time and size) of deformation. The lab includes a modeling board, a motor-drive that controls different variables of each study case, and data acquisition systems, among other materials.

Main task

Design, development, and test of a device for mechanical analysis (cohesion and internal friction angle) of granulated materials used in analogue modeling in geology and mining.

For this, students will need to develop the following specific tasks:

• Literature research regarding analogue modeling and the commonly used materials (it is recommended to have at least one virtual meeting before the internship for objectives definition)

• Analyze the scales and mechanical properties of the materials used for analogue modeling (around 2 weeks)

• Design and built a Hubbert device, or similar, to define the internal friction and granulated material coefficients (around 2 weeks)

• Develop the test of the necessary granulated material to obtain new data (around 2 weeks)

· Data analysis (around 2 weeks)

• Possible support for the elaboration of a scientific paper, according to the results and data analysis that the supervisor already possesses).

Student profile



This internship is aimed at undergraduate and master's level students from civil engineering, mechanical engineering, mining engineering, geology, or similar disciplines. Knowledge of physics, and soil and rock mechanics is required.

Spanish language only.



Two months as a minimum. In case the research includes the publication of the results and analysis of data, four months of length will be appropriate.

Working hours will be determined by the supervisor and intern.



Flextime.

After the internship, the student may participate in the elaboration of a scientific research paper, according to the job performance.

Lunch tickets for university dining.



Dr. Pamela Jara. Faculty member of the Mining Engineering



MECHANICAL ENGINEERING DEPARTMENT



Biomechanics and Biomaterials Laboratory Fields of study: mechanical engineering, biomechanical

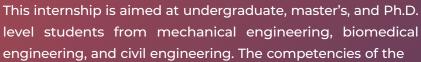
Since 2012, the Biomechanics and Biomaterials Lab has been a research and scientific knowledge hub in Chile. This is one of the very first laboratories in Chile focusing on biomechanics with proper infrastructure allowing top-level research with Chilean and foreign institutions/companies. Combining the fields of chemistry, biology, and mechanics, this laboratory also expands research alongside national and international Research Centers. More information on: https://biomat.usach.cl/



engineering

Support mechanical experiments development and biomechanical simulation. Some specific tasks include uniaxial and biaxial traction tests, analysis of experimental results and numerical simulation with finite elements.





intern should include basic knowledge of solids mechanics, programming, experimental techniques, computational mechanics, and biomechanics.

Spanish and English language are accepted.



Two months.

35 hours/per week



Flextime.

Possibility to participate in the elaboration of a scientific research paper.

Possibility to participate in academic events Lunch tickets for university dining.

Supervisor

Dr. Claudio García Herrera, Faculty Member of the Department of Mechanical Engineering. Fields of study: mechanics, fluid-structure interactions

The main experimental facilities are 2 high-speed cameras, a particle image velocimeter, 2 shake tables, ultrasonic sensors, and fill sensors. See as examples FSI-LAB here. Facilities to make numerical simulations and develop formulations and models.





Perform numerical modeling or PIV experiments. The intern will need to collaborate in the development of numerical or experimental modeling and the analysis of the results.



This internship is aimed at undergraduate, master's, and Ph.D. level students in mechanical engineering; in the case of graduate students, specialization in numerical (computational mechanics) or experimental analysis is required. Students need to know basic programming (Fortran, C, or Phyton), and interest in theoretical and experimental mechanics.

Spanish, English, and French languages are accepted.



The length of time and working hours will be determined by the supervisor and intern.



Flextime.

Possibility to participate in the elaboration of a scientific research paper.

Possibility to participate in academic events.

A small stipend could be given according to the intern's job performance.

Lunch tickets for university dining.

Superviso



Dra. Marcela Cruchaga, Faculty Member of the Department of Mechanical Engineering.

> Check out a previuos experience in the lab here:





Fields of study: energy

In this Lab (LAT, in Spanish), students and researchers develop research and teaching in the thermofluids area. The lab includes different techniques for the characterization of thermophysics of solids and fluids mainly used in applications of thermal storage and energy efficiency. Additionally, tools for computer simulation are implemented for evaluating materials, building processes, and thermal systems. LAT seeks to be a national referent in the thermical area, by offering opportunities for scientific cooperation and other services.

More information on https://lat-usach.cl/



Perform thermal characterization of materials by using different techniques.

For this, students will need to develop the following specific tasks:

· Prepare heat transfer materials based on PCMs and nanomaterials.

- · Develop thermal characterization of these materials.
- · Data analysis
- Reports generation

Student profile



This internship is aimed at undergraduates from mechanical engineering, chemical engineering, and master's and Ph.D. students of engineering sciences. Students need to have experience in the use of lab equipment and analysis of experimental results in the field of thermal storage or nanofluids. Spanish and English Language are accepted.



35 hours per week.

Length of time will be determined by the supervisor and intern.



Flextime.

Possibility to participate in the elaboration of a scientific research paper.

Possibility to participate in academic events.

A small stipend could be given according to the intern's job performance.

Lunch tickets for university dining.





Dr. Diego Vasco, Faculty Member of the Department of Mechanical Engineering.



ELECTRICAL ENGINEERING DEPARTMENT

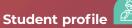
https://die.usach.cl/ 🖄

Sustainable Energy Systems Research Center Fields of study: sustainable energy systems

This new research program is focused on doing research on different topics concerning sustainable energy systems. This team of multidisciplinary scholars seeks to collaborate on projects with public institutions, and other academic entities, to strengthen the engagement with the external affairs.

Main task 🗾

Participate in one of the research projects in electrical sustainable projects, H2 green, the impacts of electromobility, and sustainable energy in facilities.



This internship is aimed at undergraduate, masters, and Ph.D. students of any program in engineering with a specialization in sustainable energies.

Spanish, English, and Portuguese Languages are accepted.

Period

Length of time and working hours will be determined by the supervisor and intern.





Flextime.

Possibility to participate in the elaboration of a scientific research paper.

A small stipend could be given according to the intern's job performance.

Lunch tickets for university dining.



Dr. Héctor Chávez, Faculty member of the Department of Electrical Engineering.

Check out a previous experience in the Departament of Electrical Engineering here:





APPLICATION PROCESS

The documents required are the following:

· Curriculum Vitae (for Ph.D. level applicants, CV must contain personal statement, research objective, and academic experience)

· Cover letter

· Academic transcript for undergraduate and master's level applicants

· Passport or ID scanned

Documents need to be sent to **fing.international@usach.cl** with the subject "Internship application".

GENERAL CONDITIONS

Once you are selected, students will have access to the following:

- · Lunch tickets for university dining
- \cdot Orientation for arrangements and arrival planning by the Coordinator of Global
- Education of the Faculty of Engineering
- · USACH student card
- · Internship Completion Certificate









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