Internship in Materials and Environmental Issues

Supervisor	Prof. Dr. Carlos Alberto Mendes Moraes
Project	**Industrial Solid Waste Valuation (byproducts) in the perspective of cleaner production (CP) and Life Cycle Assessment (LCA)** http://www.unisinos.br/graduacao/engenharia-ambiental/presencial/sao-leopoldo http://www.unisinos.br/graduacao/engenharia-de-materiais/presencial/sao-leopoldo http://www.unisinos.br/vestibular/curso/engenharia-mecanica/sao-leopoldo http://www.unisinos.br/mestrado-e-doutorado/engenharia-civil/presencial/sao-leopoldo http://www.unisinos.br/mestrado-e-doutorado/engenharia-mecanica/presencial/sao-leopoldo
Description	It is been carried out under my Coordination many research projects related to the generation of industrial solid wastes (metal mechanics, steelmaking process, casting, agribusiness, chemical and polymer companies, e-waste). The perspective of our research begins by the implementation of cleaner production program or concept to reduce waste generation and qualify the excedents ones. Those solid wastes become important material to be transformed in byproduct with economical value in many applications (refractories, energy, civil construction, polymer compounds, composites, agriculture etc.). So we are doing research studying the processes, characterization of these materials, development of products, and also cleaner technologies, and recovery of critical and rare metals or oxides. The Life Cycle Assessment is a fundamental tool for decision-making in those solutions we chase.
Tasks	The laboratory of Characterization and Valuation of Materials (LCVMat) has different equipment to carry out the characterization of wastes from different industrial activities and processes to develop new materials as byproduct or even products. Materials are researched based on physical, chemical, and microstructural standards: grain size distribution, surface area, porosity, specific weight, loss on ignition, total carbon, chemical composition, crystalline phases, Thermogravimetric (TGA) and Differential Thermal Analysis (DTA). To develop opportunities, we have muffle furnace, pyrolis furnace, and fluid bed reactor. In the computational labs we have the software SIMAPRO and CES Edupack to evaluate LCA aspects of the processes and products we develop, as tools for decision-making.
Requirements	• Students of Environmental Sciences • Students of Materials Engineering • Students of Mechanical Engineering

	• Undergraduate student (at least beginning of the 3rd year) • Basic skills in scientific working (lab and/or field experiments)
Language Skills	English (Portuguese would be better but it is not necessary).
Duration	4 months
Possible Beginning	Between February/July
Credits	According to agreement
Payment	None