



Assignment internship Chemical Engineering or Chemistry

Living Lab Biobased Brazil

The Living Lab Biobased Brazil is a transnational Living Lab in the field of Biobased Economy, created in 2014 by a consortium of Dutch Universities of Applied Sciences in collaboration with several Brazilian universities. The Living Lab helps students with internships and graduation projects in the Netherlands with the focus on Biobased Economy. We also help students finding accommodation, and offer buddy support and some events.

For more information please see www.biobasedbrazil.org and www.biobasedbrazil.org/student/the-netherlands/ or ask the International Office of your university.

University of Applied Sciences information:

The universities of applied sciences (in Dutch: 'hogescholen') offer programs that focus on the practical application of arts and sciences.

Getting practical work experience through internships is an important part of the professional study programs offered at these institutions. The largest universities of applied sciences enroll 20,000 to 40,000 students. Altogether some 446,000 students are enrolled on professional programs. University of Applied Sciences have also research groups. This groups do applied research and they are so called professorships. This internship assignment is within one of the associate professorships.

Avans University of Applied Sciences information:

Avans University of Applied Sciences was founded on 1 January 2004 following a merger of Hogeschool Brabant and Hogeschool 's-Hertogenbosch. At Avans University of Applied Sciences, around 29,000 students study 54 different courses. 2,400 employees work at 20 schools, 4 support units and 1 Learning and Innovation Centre.

Students, lecturers, professors and education professionals together form a lively network within our educational institution. Knowledge and competency development is the driving force and the connecting factor behind this.

Our varied and modern learning environment enables each student to develop his or her skills and ambitions to their maximum potential.

Our inspiring lecturers are experts in their fields and have a thorough knowledge of learning processes, enabling them to challenge students to push their boundaries and excel. The schools have structured their curricula, teaching and examinations based on our educational vision. We collaborate with a wide range of companies, professions and organizations as part of its teaching and research activities.

For more information please see the promotional YouTube video:
<https://www.youtube.com/watch?v=5nsPBIE04Q4>

Main research topic:

Upgrading of Pyrolysis oil by esterification with alcohols: Reactor design.



General background:

Biomass is number one of use of renewable energy in the world (11% of all primary energy use). From a sustainability point of view the use of biomass is an eco-efficient way to bridge the unbalance between energy demand and renewable energy generation.

The Centre of Expertise Biobased Economy (CoE BBE) in Avans University of Applied Sciences in the Netherland has developed a lab-scale auger type biomass pyrolyzer with a capacity of 300 g/h. A pyrolyzer (intermediate pyrolysis) converts the biomass to valuable products including a bio-oil intermediate (35-45%) suitable for upgrading to motor fuel, a solid product (biochar (30-40%)), and gaseous products (20-30%). On the other hand, the resulting oil has a high oxygen content and relatively low heating value. Pyrolysis oil is also highly acidic and corrosive (pH 2–3), and as a result fresh bio-oil is inherently unstable at room temperature, deteriorating via polymerisation and condensation reactions on storage with attendant increased viscosity and poorer combustion. Biomass pyrolysis routes to transportation fuels are therefore only economically viable if the bio-oil is subjected to upgrading treatments to improve their physicochemical properties.

Goal of internship:

To test a fix-bed reactor for upgrading of pyrolysis oil by esterification with alcohols.

Activities:

The Project involves:

- Measuring reaction kinetics;
- Applying a mass transfer and reaction model to the reactor;
- Economy analysis.

Final product

The student will write a report that contains an overview of all activities and findings.

Starting date

February 2019. The length of the assignment is approximately 5 months (20 weeks). The student who will execute the assignment get a fee of €550,- per month.

The intern will be part of a research team lead by the adviser and supervised by Prof. Qian Zhou.

Desirable skills/qualities of the student

The student should be able to carry out independent laboratory research. The preferred background is chemical engineering or chemistry. The interest in bioenergy is a pre.

Good knowledge of the English language is required. We have set minimum language requirements for foreign students. The minimum English language prerequisite is: an academic IELTS test (or equivalent*) with an overall band score of at least 6.0. As a foreign student you must provide evidence of your language competences in the form of an official certificate: IELTS, TOEFL, TOEIC or Cambridge ESOL. It is your responsibility to ensure that you meet these requirements. **Please see the requirements on the webpage.**



Living Lab Biobased Brazil
Education Research Innovation

Information of the company:

Contact person concerning this assignment : Erik Lammers
Phone : +316 101 83 092
E-mail : ekf.lammers@avans.nl
Visiting address : Centre of Expertise Biobased Economy
Street / number, areal code and place : Lovendijkstraat 63, Breda
Postal address : 4800 RA
Website : www.biobasedbrazil.org

Interested?

Please see the procedure at <https://www.biobasedbrazil.org/student/the-netherlands/>. Please be aware that the process stated at the above mentioned link applies.

PLEASE CONTACT FOR ADDITIONAL INFORMATION THE INTERNATIONAL OFFICE OF UFMG, UFV, UFSJ, UFOP OR PUC MINAS