(versie 30-11-20)

Topic for internship	Professor in the Netherlands	University	Extra info & Example projects
Biofuel			
	Maurits Dorlandt	Avans	• Life cycle analysis for the process of pyrolysis. Working with GABI modelling software, client contacts, environmental impact assessment. Examples of previous internships: performing LCAon converting biomass into useful products by pyrolysis (24).
Biogas			
Biorefinery	Qian Zhou	Avans	• Biomass pyrolysis process optimization (reactor, chemical engineering, simulation, laboratory work). Pyrolysis product purification (chemical engineering, simulation, laboratory work). • Example of previous internships: pyrolysis of cashew nut shell using Auger pyrolyzer (23). • Performing LCA on pyrolysis processes of converting different kind of feedstocks into valuable end-products by taking into account the whole chain value. Example: literature research, modelling the pyrolysis process, writing a report, contact with clients (17).

Topic for internship	Professor	University	Extra info & Example projects
Biorefinery - ASPEN modelling			• Examples of previous internships:
Wastewater treatment	Hans Cappon	HZ	• Recycling of surface and process water for industry, agriculture and aquaculture. • Recovery of valuable content in wastewater, like nutrients and humid acids. • Process monitoring and control, like smart sensors to monitor water quality • Examples of previous internships: Reduce the total organic carbon content of industrial condensate using IX and adsorption (11)
	Rudy Folkersma	Stenden	• Electrohydrodynamic Atomization. Examples of previous internships: support and conduct experiments in the laboratory, write reports, perform literature review, work with data analysis and data treatment. The research topic is the application of electrohydrodynamic atomization (EHDA) as an emulsification tool. The process has many applications both in food technology and water technology. The experiments will be conducted in the EHDA laboratory inside the Water Application Centre in the city of Leeuwarden, The Netherlands (30).

Topic for internship	Professor	University	Extra info & Example projects
Drinking water treatment			
Reuse of residual streams	Michiel Michels, Guilherme de Souza Reis	Avans	• Optimization of green extraction of PHA. Example of previous project: Accumulation of PHA bioplastic in microorganisms from secondary sludge (microbiology, bioreactors, analytical chemistry, simulation). Solvent extraction of PHA bioplastic from dry biomass (solvent extraction laboratory work, analytical chemistry) (33)
Environmental Impact Assessment (EIA)	Alwin Hoogendoorn, Harbert Pater	Avans	• Life cycle analysis for biocomposite materials for buildings and bridges. Working with GABI modelling software in compliance with ISO 14040, client contacts, environmental impact assessment. Part of the LCA is calculating a few end of life options both including & excluding molecular chemical recycling and re-use of expensive bio-epoxy resins and flax fibers. The LCA work is part of large research and demonstration projects with Dutch, Belgian and German partners.
Building and Construction	Michiel Ritzen	Zuyd	• Practical research in the field of sustainable and circular building and construction, both on building as on urban scale. Running projects cover sustainable material development for the construction industry, circular material application, LCA of construction materials and components, architectural and technical designing, and energy efficient installations aspects. Projects are in close collaboration with (inter)national partners.
Biocomposites	Rudy Folkersma	Stenden	• Obtain more knowledge about biocomposites: these materials are very promising for replacement of wood, steel and concrete. Example of previous projects: Depending on skills you work on either 1. Synthesis of biobased resins or 2. Processing of biocomposite materials. Preparing compounds based on natural fibres and a polymer - Analysing techniques; chemical and mechanical - Preparing new polymers or compounds (new fibre-polymer combinations). - Cooperating in a larger project together with PhD's and researchers - Gain knowdledge about the biobased economy (31).
Advanced Materials	Gino van Strijdonck	Zuyd	• Nano structured coatings for energy management e.g. switchable heat blocking coatings.(Biobased) Materials for 3D printing (e.g. light weight automotive and prostheses). All projects are conducted with companies in the laboratories of CHILL (www.chillabs.nl) situated at Chemelot, a major chemical production and research site. (16)
Business and Innovation	Jappe de Best	Avans	What are the market opportunities in Brazil for products from organic waste (biogas, biopellets, ..). Who are the possible buyers, what is the competition etc. see link for more information
Geosciences Ecosystem services			

Biopolymers & biomolecules	Qian Zhou	Avans	• Biocarbon based biopolymer composites (polymer processing, polymer characterization). Preparing of biobased thermosets (chemistry, analytical chemistry, laboratory work).
	Alexander Compeer	Avans	• Practical lab research on bio flocculants, LCA scan and desk study on removal of heavy metals from sludge.
	Rudy Folkersma, Corinne van Noordenne	Stenden	• Research of PHA's: processing, behaviour and possible application of PHA's. Example of previous projects: Preparing compounds based PHA's, and other biopolymers. - Analysing techniques; studying biodegradability of these materials - Preparing new polymers or compounds (combination with natural fibres based on cellulose). - Cooperating in a larger project together with PhD's and researchers (58 1-2)
	Michiel Michels, Guilherme de Souza Reis	Avans	• Accumulation of PHA bioplastic in microorganisms from secondary sludge (microbiology, bioreactors, analytical chemistry, simulation). • Solvent extraction of PHA bioplastic from dry biomass (solvent extraction laboratory work, analytical chemistry). • Examples of previous internships: optimization of green extraction of PHA (22).
	Gino van Strijdonck	Zuyd	• Polymer processing (3D printing). Polymeric materials. The project is conducted by a project group consisting of students, researchers/lecturers and experiences professionals in the Chemelot Innovation and Learning Labs (www.chillabs.nl) situated at the Brightlands Chemelot Campus an international hotspot in Chemistry and Materials Research 16).
Ecology			
Sustainable syntheis and production	Gino van Strijdonck	Zuyd	• Solar conversion (CO_2 valorization, nano-catalysis, photo reactors), microreactor technology, biotechnological conversions, polymers, pharma, depolymerisation
Composting	Maurits Dorlandt	Avans	• Biodegradability of (bio)plastics in compost