

CENTRO UNIVERSITÁRIO DE MARINGÁ/ UNICESUMAR

POSTGRADUATE PROGRAM IN CLEAN TECHNOLOGIES

1. Introduction and some History

The Postgraduate Program in Clean Technologies (PGPCT) of the *Centro Universitário de Maringá* (UNICESUMAR) is a Master's Program acknowledged by the Coordination for the Upgrading of Personnel in Higher Institutes (CAPES) and underscores the UniCesumar's concern in research and postgraduate course in Clean technologies within Environmental Sciences. Foregrounded on the concepts of Environmental Sciences, its interdisciplinary stance welds research fields, transfers methodologies, produces new knowledge and forms differentiated professionals who will cope with the complexity of current issues.

PGPCT was authorized by the Coordination for the Upgrading of Personnel in Higher Institutes (CAPES) of the Ministry of Education on the 17th June 2014 and the first group of students started its activities for their Master's degree during the same year.

Based on its research proposals, PGPCT promotes teaching, research and university extension within an interdisciplinary stance, aiming at environmental, economic and social sustainability in the urban and rural milieu.

The consumption of resources for human activities in the urban area produces wastes which should be analyzed for their decrease, reuse and recycle.

Indispensable for human activities and survival, hydric resources require special attention so that they could be conserved for current population, within a long term, in quantity and quality. Technical and proactive activities in the treatment and consumption and post-consumption of water resources are required so that this aim may be achieved.

Sustainability in agribusiness is a highly relevant theme in livestock activities and in agro-industries. Residues may have different types of disposal, ranging from their recycling as alternative food for animal rations and organic fertilizers to the production of energy from wastes and residues.

2. Field of specialization: Environmental Sciences

The field of specialization in Environmental Sciences was established by CAPES in 2011 due to the research work that aims at studying the complexity of environmental issues. The Document of the Area – Environmental Sciences / 2013 (CAPES) states that studies on the complex nature of environmental problems should engage disciplines of different sciences to displace theoretical and methodological challenges to the area. The same document enhances that Environmental Sciences should be linked to themes such as water, energy, food safety, agriculture and others.

Consequently, the postgraduate program in Clean Technologies / UniCesumar, with the field of specialization in Environmental Sciences, is the product of great responsibility for the environment in the urban and rural milieu, focusing on issues on environmental, economic and social sustainability within an interdisciplinary aspect.

3. Areas of Research

3.1. Urban eco-efficiency

Urban eco-efficiency is foregrounded on investigation of viable social transformations towards sustainable development and the guarantee of life quality for future generations. Two projects have been organized for analysis within the research area: Urban Eco-efficiency and Hydric Resources and Urban Eco-efficiency and Solid Residues. The two projects focus on urban space and activities. Whereas the former investigates strategies for treatment, use and disposal of water resources and aims at a more efficient management of hydrographic basins, the latter deals with the improvement of treatment and disposal of solid residues produced by urban socio-economic activities.

3.2. Agro-industry and sustainable agriculture and livestock

This research area aims at improving the production processes of agro-industry and agriculture-livestock activities for a quantity-quality balance in social, productive, economic and environmental interactivities on farms. Research area focuses on two projects: Sugar-Alcohol Agro-industry and Environment and Studies for the application of Agro-industry Residues and Agriculture-Livestock Activities in Agriculture and Livestock, aiming at the region's industrial, agricultural and livestock activities.

4. Post-doctorate Program

The Postgraduate Program in Clean Technologies (PGPCT) of the *Centro Universitário de Maringá* (UNICESUMAR) offers a one-year scholarship for the development of a research project linked to the specialization field in Clean Technologies and to the research areas Urban Eco-efficiency and Agro-Industry and Sustainable Agriculture and Livestock. A good evaluation of the scholarship holder's performance determines a further contract till the maximum limit of sixty months (Brazilian Program for Post-Doctoral Scholarship: CAPES n. 86/2013 / Decree n. 007/2015-MTL).

5. Scientific Journal

Since March 2015, the Scientific Journal in Agribusiness and Environment (RAMA) is linked to the PGPCT to enhance interdisciplinarity of research areas based on the theme of environmental, economic and social sustainability.

6. Curriculum

COMPULSORY DISCIPLINES	STUDY LOAD	CREDITS
Clean Technologies	45	3
Methodology in Interdisciplinary Research	45	3
Society and Ecology	45	3
COMPULSORY SUPPLEMENTARY ACTIVITIES	STUDY LOAD	CREDITS
Seminars: Regional Socio-environmental Themes	45	3
Interdisciplinary Activities	30	0
Master's Dissertation Project (MDP)	0	0
Proficiency in a foreign language*	0	0
Supervision in Master's Dissertation	180	6
DISCIPLINES IN RESEARCH AREA URBAN ECO-EFFICIENCY	STUDY LOAD	CREDITS
Urban Space and Sustainability	45	3
Behavior and Eco-responsible Behavior	45	3
Hydric Studies	45	3
Solid Residues Studies	45	3
DISCIPLINES IN RESEARCH AREA: SUSTAINABLE AGRO-INDUSTRY, AGRICULTURE AND LIVESTOCK	STUDY LOAD	CREDITS
Production processes in the sugar-alcohol agro-industry	45	3
Renewable energies and management of residues from agro-industries, agriculture and livestock	45	3
Production chain of eco-responsible agro-industry, agriculture and livestock	45	3
Animal production and reproduction	45	3
OPTIONAL DISCIPLINES	STUDY LOAD	CREDITS
Treatment of industrial effluents	30	2
Chemical methods applied to environmental analyses	30	2
Environmental microbiology	30	2
Supervision and evaluation of environmental impacts	30	2
Methodology in higher education	30	2

* According to Art. 28, proficiency in one modern foreign language is mandatory for all students admitted to the Post-graduate Program at Master's Level. PPGTL accepts proficiency exams in one of the following modern languages: French, English and Spanish.

7. International cooperation

UNICESUMAR has established agreements with foreign universities with regard to mutual cooperation and exchange. International exchange contributes towards the capacitation of professors and post-graduate students in their preparation for intervening in the market.

- University of Florida (USA)
- Universidade Blas Pascal, Universidad Nacional de Rosario and Universidad Del Centro Educativo Latinoamericano (Argentina)
- Universidade Mayor (Santiago del Chile)
- Universidad Politecnica y Artística, Universidad Americana and New Zealand Educated (Paraguay)
- CAEP BRASIL – University of Minnesota (USA)

8. Contact

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