

## **UNICESUMAR – UNIVERSITY CENTER OF MARINGÁ**

### **Graduate program**

### **MASTER DEGREE IN CLEAN TECHNOLOGIES**

#### **Program description**

Advanced interdisciplinary degree combining different areas in Environmental Sciences, Agroindustry, Sustainable Agriculture and Livestock including environmental education, natural resources, animal production and wastes, biotechnology, ethanol sustainable industries and animal and vegetal agroindustry organic wastes applied as soils fertilizer.

#### **1. Introduction and some history**

The Graduate Program in Clean Technologies (GPCT) of the *UniCesumar – University Center of Maringá* is a Master's Degree Program acknowledged by the Coordination for the Upgrading of Personnel in Higher Institutes (CAPES) and underscores the UniCesumar's concern in research and graduate 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.

GPCT was authorized by the Coordination for the Upgrading of Personnel in Higher Institutes (CAPES) of the Education Ministry on the 17<sup>th</sup> 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, GPCT promotes teaching, research and university extension within an interdisciplinary stance, aiming at environmental, economic and social sustainability in the urban and rural environment.

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, 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 graduate 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 environment, focusing on issues on environmental, economic and social sustainability within an interdisciplinary aspect.

## **3. Research Areas**

### **3.1. Urban ecoefficiency**

Urban ecoefficiency 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 Ecoefficiency and Hydric Resources and Urban Ecoefficiency 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 socioeconomic activities.

### **3.2. Agroindustry and sustainable agriculture and livestock**

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

## **4. Scientific Journal**

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

## 5. 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 ECOEFFICIENCY	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 ecoresponsible agroindustry, 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 Brazilian Law Graduate Programs, Art. 28, proficiency in one modern foreign language is mandatory for all students admitted to the Graduate Program at Master's Degree. GPCT accepts proficiency exams in one of the following modern languages: French, English and Spanish.

## 6. Professors and their research areas

### P1. ECOEFFICIENCY AND WATER RESOURCES

Professor	Research project
<b>Luciana Herek Rezende</b> (chemical)	Use of urban and industrial waste in clean technologies
<b>Natália Ueda Yamaguchi</b> (chemical Engineer)	Development of water treatment processes using clean technologies
<b>Luiz Felipe Machado Velho</b> (biologist)	Ecology and conservation of continental aquatic environments with emphasis for standard studies of diversity and plundance community plankton abundance and its use in environmental monitoring
<b>Maria de los Angeles Perez Lizama</b> (biologist)	Water resources, pollution and use of bioindicators of water quality in rivers and urban flows in paraná state, brazil.

### P2. URBAN ECOEFFICIENCY AND WASTE

Professor	Research project
<b>Edneia Aparecida de Souza Paccola</b> (biologist)	Studies on sustainable technologies for the management of urban residues
<b>José Eduardo Gonçalves</b> (chemical)	Analytical methods employed in environmental analysis by the use of clean technologies: environmental monitoring of water, sediments and food by chromatographic determinations
<b>Rute Grossi Milani</b> (psychologist)	Residues: subjectivity and interdisciplinary ecological practices
<b>Tânia Gomes</b> (historian)	Health and urban nature: a socio environmental approach

### P3. AGROINDUSTRY, AGRICULTURE, LIVESTOCK AND ENVIRONMENT

Professor	Research project
<b>Márcia Aparecida Andreazzi</b> (zootecnist)	Technological alternatives for the use and destination of animal production wastes
<b>Fábio Luiz Bim Cavalieri</b> (zootecnist / veterinary)	Biotechnology in the reproduction and sustainability of animal production
<b>Isabele Picada Emanuelli</b> (veterinary)	Development of sustainability methodologies in the production and reproduction of animals
<b>Francielli Gasparotto</b> (agronomist)	Development of sustainable methods applied to agriculture and sustainable agroindustries
<b>Edison Schmidt Filho</b> (agronomist)	Usage of organic wastes from animal and vegetable agroindustries as corrective soils or fertilizers in agricultural areas

## 8. Contact and Information

### **GRADUATE PROGRAM SECRETARY OF CLEAN TECHNOLOGIES**

Block 7 - Avenida Guedner, n. 1610 - Jardim Aclimação – Zip Code 87.050-390

Maringá - Paraná - Brazil

E-mail: [ppgtl@unicesumar.edu.br](mailto:ppgtl@unicesumar.edu.br)

Telephone: (44) 3027-636, branches: 2153, 1178 and 1475

Office hours: 8h00 to 12h00 and 14h00 to 18h00.

### **DR. DURVAL CORREA MEIRELLES**

Graduate Director

### **MSC. LUDHIANA ETHEL KENDRICK SILVA**

Research Director

### **DR. MÁRCIA APARECIDA ANDREAZZI**

Graduate Program Coordinator

### **MARIA SUELI DE SOUZA RUFINE**

Graduate Program Secretary

### **MARCIA CRISTINA DA SILVA DE ALMEIDA**

Graduate Program Secretary