



Ph.D. Program of Biological Science and Engineering Summary 2011

This scholarly course-driven doctoral program is focused on managing ecological problems and using biological engineering to boost innovation. The program is also aimed at promoting safe and economical use of biodiversity and the development of the agro-industry sector through biotechnology. The program lasts a minimum of five academic semesters.

Degree

After completing all the program requirements the students are awarded with the ***Doctoris Philosophiae, Ph.D.*** degree (Doctor of Philosophy). Students can choose one of two major fields of specialization: a) Applied Ecology, and b) Biological Engineering and Biotechnology.

Admission Requirements

- A. Master degree in either natural sciences (biology, chemistry, environmental sciences) or biology based engineering (agricultural, chemical, biochemical, industrial, environmental or food) not older than 12 years.
- B. An Acceptance Letter from a Program professor with whom the thesis work will be carried out. For this, the applicants should complete the Application Form together with detailed *curriculum vitae* showing conditions for performing research. These documents should be sent to the appropriate professor by e-mail.
- C. Spanish and English proficiency. If Spanish is not the mother tongue the applicant should be aware that if admitted, he or she is not allowed to follow courses during the first year unless Spanish proficiency is granted by the Department of Languages.
- D. Legal copies of degrees and transcripts are required for registration.

Study Program

The program lasts a minimum of five academic semesters (30 - 36 months at dedicated work, including 20 hours per week of field or lab work without credits), a minimum of 48 course credits, two foreign languages (English and other different

from mother tongue) and at least one paper in a refereed journal with an impact factor above 0.5.

2011 Study Program

Semester I (9 credits)		Semester IV (10 credits)	
• Theory of Biology*	2 cr.	• Doctoral Research	10 cr.
• Global Biodiversity*	3 cr.		
• Biological Engineering*	3 cr.		
• Doctoral Research	1 cr.		
Semester II (9 credits)		Qualifying Examination	
		Semester V (10 credits)	
• Course 1 of the major field	3 cr.	• Doctoral Research	9 cr.
• Course 2 of the major field	2 cr.	• Research Seminar II	1 cr.
• Additional Course**	1 cr.		
• Additional Course **	1 cr.		
• Research Seminar I	1 cr.		
• Doctoral Research	1 cr.		
Semester III (10 credits)		Semester VI (without registration)	
• Course 3 of the major field	3 cr.	• Publication of at least 1 paper	
• Additional Course **	1 cr.	• Thesis writing	
• Additional Course **	1 cr.		
• Doctoral Research	5 cr.		
Doctoral Thesis Dissertation			

* These courses are pre-requisite for Major Field and Additional Courses.

** Modular courses offered between semesters.

*Courses of Major Field: **Applied Ecology***

- Ecology of Conservation (3 credits)
- Quantitative Biology (2 credits)
- Pest Ecological Management (3 credits)

*Courses of Major Field: **Biological Engineering and Biotechnology***

- Plant Molecular Genetics and Genetic Engineering (3 credits)
- Engineering of Metabolite Extraction and Purification (2 credits)
- Simulation and Optimization of Biotechnological Processes (3 credits)

Additional Courses (4 credits should be taken)

- Microbial Functional Genomics (2 credit)
- Molecular Biology of Plant and Microbe Interactions (1 credit)
- Molecular Bioprospecting (2 credit)
- Secondary Products of Plant Tissue Culture (1 credit)
- Microbial Molecular Diversity (1 credit)
- Biological Systems of Waste Water Treatment (1 credit)
- Current Strategies for Pest Control (1 credit)
- Environmental Policies and Legislation in Latin America (1 credit)
- Mixing Aspects and Scale Up of Bioreactors (1 credit)

Tuition and Fees

University fees amount for approximately US\$ 107.00 per semester and total tuition for foreign students amounts for US\$ 10,000.00. Admitted students should provide their financial capability. Living cost in Lima is about US\$ 550.00 per month for a single person. We encourage the students to look for scholarships from financial institutions.

Research topics and Vacancies

For the 2011 admission the following topics and vacancies are available.

Thesis Theme	Major field	Professor	Vacancies
Bioactive compounds in native foods	Biological Engineering & Biotechnology	Dr. D. Campos (dcampos@lamolina.edu.pe) Dr. R. Chirinos (chiri@lamolina.edu.pe)	1
Functional genomics of mixed filamentous fungal biofilms	Biological Engineering & Biotechnology	Dr. M. Gutiérrez-Correa (mgclmb@lamolina.edu.pe) Dr. G.K. Villena (gkvch@lamolina.edu.pe)	1
Enzyme production kinetics of mixed filamentous fungal biofilms.	Biological Engineering & Biotechnology	Dr. M. Gutiérrez-Correa (mgclmb@lamolina.edu.pe) Dr. G.K. Villena (gkvch@lamolina.edu.pe)	1
Surface Adhesion Fermentation (biofilm) of filamentous fungi for enzyme production: optimization and bioreactor cultivation.	Biological Engineering & Biotechnology	Dr. M. Gutiérrez-Correa (mgclmb@lamolina.edu.pe) Dr. G.K. Villena (gkvch@lamolina.edu.pe)	1
Methods for Genetic Improvement of Sweet Potato	Biological Engineering & Biotechnology	Dr. Wolfgang Gruneberg (W.gruneberg@cgiar.org)	1
Prediction of late blight resistance using stacked resistance genes of <i>Solanum</i> spp.	Biological Engineering & Biotechnology	Dr. Marc Ghislain (m.ghislain@cgiar.org)	1
Total for 2011			6

Application Form

<http://www.lamolina.edu.pe/doctorado/html/ApplicationForm.doc>

Information

Dr. Gretty K. Villena, Program Coordinator
email : pdceb@lamolina.edu.pe , gkvch@lamolina.edu.pe
<http://www.lamolina.edu.pe/doctorado>