

AUTONOMOUS UNIVERSITY OF AGUASCALIENTES

DOCTORATE IN BIOLOGICAL SCIENCES (TRADITIONAL)

PROGRAM¹

I. PROGRAM IDENTIFICATION

Responsible academic center:	Center for Basic Sciences
Responsible academic departments:	Biology, Physiology and Pharmacology, Engineering Biochemistry, Microbiology, Morphology, Chemistry
Modality:	On-campus (traditional), from master's degree.
Level:	Doctorate
Program orientation:	Research Researchers Training Program
Program engagement:	Full time ²
Duration:	Three years (traditional)
Academic Credits:	200
Kind of academic program:	Institutional program
Approval date by HCU ³ :	July 30, 2018

II. QUALITY CERTIFICATIONS

National:	National Graduate Quality Program (PNPC) Quality Level: Consolidated
International:	Ibero-American Graduate University Association (AUIP)

III. PROGRAM OBJECTIVES

To train learners with a solid preparation in various fields of biological sciences, capable of generating knowledge and identifying problems at the national level, proposing solutions in their work areas, and developing interdisciplinary research projects.

¹ (Web version)

² In the case of CONACYT scholarship students, their dedication must be full-time of the program, my students who are not beneficiaries of any kind, be considered as part-time students as long as all program requests are

³ Honorable University Council

IV. LINES OF RESEARCH

1. Ecology and biodiversity
2. Chemistry and bioremediation
3. Plant and animal biotechnology and biochemistry
4. Environmental toxicology and bioengineering
5. Proteins in the immune response, in plasticity, and neural secretion

V. PROFILE OF INCOMING APPLICANTS AND GRADUATES

APPLICANTS	GRADUATES
<p><i>Knowledge:</i></p> <ol style="list-style-type: none"> 1. To demonstrate academic training in the medical-chemical-biological area within a master's program with a research focus (certificate of studies). 2. Research, through an individual presentation and defense of a master's dissertation work to the members of the Academic Council of the doctorate program. 	<p><i>Knowledge:</i></p> <ol style="list-style-type: none"> 1. Mastery in the line of research in which he/she develops a doctoral dissertation by defending it during the degree examination and the publication of at least one indexed article in JCR. 2. Proficiency of the native language and English to communicate results with scientific accuracy and to present results to an expert audience by the attendance to specialized national and international conferences. 3. Mastery of logical and mathematical reasoning that supports the analysis of the results obtained during the development of a doctoral dissertation. 4. Mastery of the techniques used to obtain the results derived from a doctoral dissertation, according to the line of research of the student. 5. Ability to develop and direct research projects by co-directing research workshops or undergraduate theses with a tutor during the development of a doctoral dissertation. 6. Ability to generate technological innovation products through the preparation and filing of patent applications before the Mexican Institute of Industrial Property. 7. To communicate properly using a technical language, both in the native language and in English, during the research stays that are developed in universities or research centers.
<p><i>Skills:</i></p> <ol style="list-style-type: none"> 1. To search, obtain and understand scientific information published internationally and scientific information obtained from international databases such as: Med Line, Tox Line, Online publications, etc. (TOEFL, 450 points upon entry, must achieve 500 within first year; Master's thesis presentation seminar and 	<p><i>Skills:</i></p> <ol style="list-style-type: none"> 1. To support ideas in the biological sciences area. 2. To select and design models that promote experimental development in the area of biological sciences, the generation of basic knowledge and the solving of problems related to human or veterinary health, to industry and the environment, locally, regionally, or nationally. 3. To identify, value, evaluate and propose solutions to identifiable problems within the specialized area. 4. Capable of generating and applying instrumental and methodological techniques to obtain the required

<p>interview).</p> <ol style="list-style-type: none"> 2. Work in a laboratory in the biological area (interview, seminar). 3. Consistently and correctly to structure scientific projects (interview, master's thesis presentation seminar). 4. To analyze and to reflect on problems in the medical-chemical-biological area (interview, master's thesis presentation seminar). 5. To design scientific research projects with formal, technical and methodological requirements (master's thesis, CV, interview, master's thesis presentation seminar). 6. Research (EXANI III, seminar, interview, academic recommendation letters provided by 2 recognized researchers). 7. Logical-mathematical ability (EXANI III). 8. Proficiency in English (TOEFL certificate, 450 points to enter, 500 points within first year). 	<p>information and the ability to modify these techniques, if necessary, and to interpret the results and obtain relevant conclusions.</p> <ol style="list-style-type: none"> 5. To communicate orally and in written form efficiently results from research in academic and scientific settings and when interacting with people in other areas of knowledge. 6. To organize and plan activities related to research and manage resources involved with projects. 7. To select and use information and communication technology required for the development of research projects. 8. To design and develop independent, scientific, original research projects. 9. To identify, select, and use different sources of information for conducting research.
<p><i>Attitudes:</i></p> <ol style="list-style-type: none"> 1. Interest in scientific research in the biological area (CVU, interview, knowledge test, EXANI III, explanatory letter). 2. Discipline for scientific work (interview). 3. Availability to dedicate full time to the Doctorate (notarized letter of commitment). 	<p><i>Attitudes:</i></p> <ol style="list-style-type: none"> 1. Open to continual learning, being able to analyze with scientific rigor. 2. Aware of the enrichment generated by working in multidisciplinary groups and the importance of the formation of new human resources involved in the area. 3. To realize that the goal of his/her knowledge is to contribute to the advancement of science and in solving practical problems to improve the living conditions of the inhabitants of the region and where he/she has influence. 4. Willingness to work as a team by respecting the ideas and contributions of others.
<p><i>Values:</i></p> <ol style="list-style-type: none"> 1. Social commitment to value and develop academic life and to search for and solve the needs of the social environment. 2. Responsible for autonomous learning, social problems and needs, contributing to the development of the country and perseverance for the achievement of proposed goals. 3. Tolerant of diverse ideas. 4. Respect for university autonomy. 5. Professional ethics and respect for intellectual property. 	<p><i>Values:</i></p> <ol style="list-style-type: none"> 1. Social commitment to value and develop academic life and to search and solve the needs of the social environment. 2. Responsible for his/her autonomous learning, to social problems and needs, and to contribute to the development of the country showing perseverance for the achievement of the proposed goals. 3. Tolerant of diverse ideas. 4. Respect for university autonomy. 5. Professional ethics and respect for intellectual property.

VI. ADMISSION AND SELECTION REQUIREMENTS

a) *Admission requirements for national applicants*

- To obtain a master's degree in Bioprocesses, Plant Biotechnology, Ecology, Toxicology, Physiology, Immunology, Morphology, and alike, that is, areas related to the program with a focus on research. This must be accredited by presenting the master's degree or the degree examination certificate in accordance with the General Regulation of Teaching.
- To submit a letter of commitment stating the support of a tutor or tutors for the development of the thesis; the tutor must manifest academic and financial availability to develop the research project.
- To submit two letters of academic recommendation from research professors the applicant have worked with.
- To submit a letter of commitment stating the availability to dedicate full-time to the program.
- To have a minimum eight (8.0) grade point average or equivalent in master's degree.
- To submit a CV.
- To submit a purpose letter.
- To demonstrate English proficiency according to the General Regulation of Teaching.
- To present a master's thesis
- To prove two of the following requirements:
 - The applicant must have obtained their degree within two years after having completed the master's courses (this will evaluate the engagement with academic life).
 - Article in a peer-reviewed journal (this will evaluate scientific skills and the capacity to structure scientific terms coherently).
 - Membership to an academic body with an interest in obtaining the degree to improve the status of the academic body to which the applicant belongs, or present evidence that once the degree is obtained, the applicant will focus on research (this will evaluate the interest and commitment to research),
 - To perform professionally in the area related to the postgraduate degree the student wishes to enter (this item will provide elements to evaluate the consistency with the areas of the program).
 - To have obtained a master's degree in a program belonging to CONACYT (here the dedication, scientific rigor, availability and commitment will be evaluated).
 - Presentation of a work derived from a master's thesis in an academic forum (scientific interest will be evaluated).
- Complete the selection process according to the General Regulation of Teaching and provide all academic and administrative documents as required.

b) *Academic admission requirements for international applicants*

- To obtain a master's degree in the biological, chemical, agronomic, medical or related areas, with a research focus. This must be accredited by presenting an apostilled and certified professional title, validated by the Records Office.
- To have a minimum eight (8.0) grade point average or equivalent in master's degree.
- To submit two letters of academic recommendation from research professors the applicant have worked with.
- To submit a letter of commitment stating the availability to dedicate full-time to the program.
- To submit a CV.
- To submit a purpose letter.

- To demonstrate English proficiency (450 points TOEFL and 500 within the first year of study). English-speaking foreigners must take the DELE level B-2 exam; however, standardized certificates with international validity equivalent to the language may be accepted.
- To complete the selection process according to the General Regulation of Teaching and to provide all academic and administrative documents as required.

VII. CURRICULAR ORGANIZATION AND STRUCTURE OF THE PROGRAM

Program credits

Developmental Axes	# of subjects	% de subjects	Credits	% of credits
Research	6	100	153	76.50
Electives	NA	NA	18	9.00
Complementary activities	NA	NA	19	9.50
Doctoral defense	NA	NA	10	5.00
Total	6	100	200	100

Curricular Map

Formation Ax / Semester	I	II	III	IV	V	VI
Research	Research Seminar I (progress of doctoral dissertation)	Research Seminar II (progress of doctoral dissertation)	Thesis I (progress of paper and PhD candidacy exam)	Thesis II (progress of paper and completion of 1st article)	Thesis III (progress of paper, submit for pub. first article, begin second article)	Thesis IV (progress of paper, submit for pub. Second article)
Electives	Courses and elective activities					
Complementary activities				National or international research stays		

VIII. PERMANENCE REQUIREMENTS

To remain in good standing, the student must achieve at least 500 points on the TOEFL exam (presenting a valid TOEFL certificate) within one year of having been accepted in the doctorate program. English-speaking international students are required to achieve a B2 level according to DELE.

Based on the UAA General Regulation of Teaching (Article 159-A), approval of a doctoral candidacy examination is included as a requirement of remaining in good standing in the program. The candidacy exam aims to verify that the student has the knowledge and skills required to successfully complete a doctoral dissertation and opt for a degree in Doctor of Science.

Characteristics of the doctoral candidacy exam:

- a. Students entering from undergraduate courses must take the doctoral candidacy exam in the fourth semester of the program. The choice of the date will be made by the student in agreement with a doctoral dissertation tutor.
- b. The presentation of this exam will be made to a committee made up of five examiners appointed by the Dean of Center for Basic Sciences. The decisions made by this committee will be by majority. The requirements to be part of the committee are the same as those that apply to the degree examination reviewers. The doctoral dissertation advisor will be part of this committee as well. The doctorate candidacy exam committee will evaluate the following aspects:
 - i. Academic performance in postgraduate studies and acquired knowledge.
 - ii. Presentation and defense of the progress of the doctoral dissertation.
- c. The grading of the PhD candidacy exam is as follows: Accredited, Accredited with Recommendations, or Not Accredited.
 - i. Accredited doctoral candidacy exam: The student may continue with the doctoral program and doctoral dissertation.
 - ii. Accredited doctoral candidacy exam with recommendations: The student will be able to continue with the doctoral program and the doctoral dissertation, but he/she will have to follow the recommendations made by the examiner committee. These recommendations can refer to two aspects: 1) modifications in the design of the doctoral dissertation and/or 2) the need for the student to increase their knowledge within a domain that is essential for the development of the doctoral dissertation and in which the committee has detected deficiencies during the doctorate candidacy exam. The way in which the student will cover these deficiencies will be determined by the committee, and compliance with the recommendations made by the committee during the candidacy exam will become one more requirement that must be met for any subsequent degree examinations.
 - iii. Non-Accredited doctoral candidacy exam: In this case, the student will not be able to continue the development of the doctoral dissertation. The student will be able to take this exam a second time and in the case of not accrediting it, he/she will be permanently withdrawn from the program. In no case, may a student enroll in the seventh semester of the program without having passed the candidacy exam (or the second year, if a student entered with a master's degree).

IX. GRADUATION REQUIREMENTS

To obtain a Ph.D., the student must 1) pass all theoretical and research courses with a minimum eight (8.0) grade point average, 2) pass a candidacy exam, 3) publish at least one article in an international indexed journal, and 4) receive approval of a doctoral dissertation from a tutorial committee.

To comply with the requirement of publishing an article, the student must choose one of the following options:

1. Submit original draft of the article or complete copy of the magazine in which it is published.
2. Present an official statement of the definitive acceptance of the article by the editor of the

magazine.

Degree Examination

The degree examination must be presented at the end of the doctorate and will have the purpose of evaluating the doctoral dissertation carried out by the student (General Regulation of Teaching-Article 160). This exam will culminate in a public session at the end of which the committee will issue its decision, which will be irrevocable (General Regulation of Teaching-Article 161).

The requirements for the degree examination to be granted are (General Regulation of Teaching-Article 162)

- a) To have accredited all the courses and other activities indicated in the program.
- b) To have a minimum final point average of eight (8.0).
- c) To prepare an original and unpublished doctoral dissertation.
- d) To have at least one published article derived from the doctoral dissertation in a journal included in the Science Citation Index or in the CONACYT Index of Mexican Journals for Scientific and Technological Research.
- e) Check that there are not debts with the Autonomous University of Aguascalientes.
- f) Paid the fee established by the Autonomous University of Aguascalientes in the tax plan.

The degree examination must be presented to a committee made up of the Supporter's Tutorial Committee plus two additional members (and two alternates) designated by the Dean (General Regulation of Teaching-Articles 165 and 166).

For those students who obtain the publication of two articles, as well as the publication of an article and the registration of a patent application, they will be considered for *Summa Cum Laude*.

X. CORE FACULTY

The information of the professors who make up the Core Faculty can be checked in this link:

<http://posgrados.dgip.uaa.mx/programas/dcb/dt/index.php/english/faculty>

XI. FLEXIBILITY OF THE PROGRAM

In accordance with the provisions of the UAA Educational Model, the General Regulation of Teaching and the curricular guidelines for postgraduate studies, the Curriculum Review Committee decided that the flexibility of the program should favor the student's formation in the following ways:

- Establish electives that allow the student to fulfill the credits with courses offered by in the program.
- For developing a doctoral dissertation, pursue student mobility abroad by taking advantage of the mixed scholarship program offered by CONACYT; which favors the formation of collaborative networks between members of the NAB with different national and international institutions of recognized prestige in the areas of the program.

In both modalities, 18 optional credits must be covered in accordance with the provisions of the curricular map. Electives, as well as the research activities, will be selected in common agreement between the student, tutor(s), and the tutoring committee.

In the case of the direct modality doctorate program, the electives will be carried out between the second and fifth semesters while the complementary activities between the fifth and seventh semesters.