



**AUTONOMUS UNIVERSITY OF AGUASCALIENTES**  
**DOCTORATE IN BIOLOGICAL SCIENCES**  
**(DIRECT MODALITY)**  
**PROGRAM<sup>1</sup>**

**I. PROGRAM IDENTIFICATION**

Responsible academic center:	Basic Sciences Center
Responsible academic department:	Chemistry Biochemical Engineering Physiology and Pharmacology Morphology Microbiology Biology
Modality:	On Campus
Program engagement:	Full Time
Level:	Doctor's Degree
Program orientation:	Researcher training program
Type of academic program:	Institutional
Area of SNII and ANUIES:	Engineering
Duration:	4 years (8 academic semesters)
Academic credits:	280
Approval date by the HCU <sup>2</sup> :	December 2023

**II. QUALITY CERTIFICATIONS**

National:	National Postgraduate System (SNP)
International:	Ibero-American Postgraduate University Association (AUIP)

**III. PROGRAM OBJECTIVE**

Objective:

To form doctors in Biological Sciences, with the capacity for analysis and critical thinking that translates into the generation, transmission and application of knowledge, with adherence to the scientific method. In addition, graduates of this academic program must be willing to work as a team and participate, in their field of competence, in an effective, committed, and ethical manner, in the solution of social, productive, and environmental problems that affect the quality of life in the region, the country and the world.

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<sup>1</sup> (Web version)

<sup>2</sup> Honorable

#### **IV. LINES OF RESEARCH**

**Ecology and biodiversity:** Study of the relationship of organisms with their natural environment at different levels of organization and biodiversity in an integrated manner under evolutionary bases.

**Plant and animal biotechnology and biochemistry:** Conservation and rational use of threatened Mexican wild species, through cultivation, propagation, conservation of "in vitro" germplasm, generation and study of genetic fingerprints and phytochemical studies. Knowledge and improvement of plant species used by humanity. Isolation and analysis of genes, bioinformatics and proteomics for the identification and knowledge of genes and proteins, genetic transformation of plants. Biochemical study of secondary metabolites as plant defense mechanisms, as well as their therapeutic applications. Seed reserve proteins. Biochemical studies in animal systems related to toxicity and toxicological tests. Study of the neurophysiological, molecular and/or pharmacological mechanisms linked to the pathophysiology of pain, inflammation, learning, memory, motor control, control of food intake and substance addictions.

**Toxicology and environmental bioengineering:** Bioremediation studies of water, soil and air, study of contaminants in water, soil and air, and their effect on the environment and the health of the population. Study of cellular mechanisms (prokaryotes and eukaryotes) in response to changes in the environment. Evaluation of the adverse effects produced by xenobiotics. Monitoring of environmental contaminants and environmental risk and impact studies. Evaluation of the adverse effects produced by pathogenic agents, emerging pathogens, parasite-host interaction, as well as their dispersion in the environment, the latent risk to human health and animal health.

**Study of proteins in biological systems:** Studies of the interaction between pathogens and host, in addition those molecules involved in the immune response related to chronic inflammatory processes, autoimmunity, allergies and parasitosis are analyzed. Study of molecules that promote changes in the expression and activation of proteins, their secretion and their participation in neural regeneration.

**Chemistry and bioremediation:** Use of microorganisms and/or plants for the removal of contaminants present in the environment, production of nanomaterials (sensors, photocatalysts, semiconductors) through chemical routes (sol-gel processes and organometallic precursors) and research in the development of green chemistry (alternative energy sources).

## V. APPLICANT AND GRADUATE PROFILE

APPLICANT	GRADUATE
<p><i>Knowledge:</i></p> <ol style="list-style-type: none"> <li>1. For work in a laboratory in the biological area (interview, CVU).</li> <li>2. For research (EXANI III and through the CVU evaluation).</li> <li>3. Logical-mathematical ability (EXANI III, knowledge exam).</li> </ol>	<p><i>Knowledge in:</i></p> <ol style="list-style-type: none"> <li>1. Broad of the LGAC of the DCB in which they develop their thesis work by defending it, during the degree exam and publishing at least one article indexed in Journal Citation Reports JCR.</li> <li>2. Logicians and mathematicians who support the analysis of the results obtained during the development of their thesis.</li> <li>3. Of the techniques used to obtain the results derived from your doctoral thesis in accordance with the LGAC of the DCB that you cultivate.</li> <li>4. In preparing to direct research projects by co-directing research workshops or bachelor's thesis with your tutor, during the development of your doctoral thesis.</li> <li>5. Generate technological innovation products by preparing and submitting patent applications to the Mexican Institute of Industrial Property.</li> <li>6. Use specific technical language in your area in your mother tongue as well as in English during your research stays at IES or National or Foreign Research Centers.</li> <li>7. Of the scientific method.</li> <li>8. In database management and information search relevant.</li> </ol>
<p><i>Skills</i></p> <ol style="list-style-type: none"> <li>1. For work in a laboratory in the biological area (interview, CVU).</li> <li>2. For research (EXANI III and through the CVU evaluation).</li> <li>3. Logical-mathematical ability (EXANI III, knowledge exam).</li> <li>4. Internet management (EXANI III, interview).</li> <li>5. Proficiency in English (TOEFL record of 450 points upon entry, within a year you must achieve 500).</li> <li>6. Ability to communicate orally and in writing in Spanish, and ability to understand scientific and technical texts in English.</li> </ol>	<p><i>Skills for:</i></p> <ol style="list-style-type: none"> <li>1. Substantiate ideas from the area of biological sciences.</li> <li>2. Select and design models that guide experimental development, in biological sciences, to the generation of basic knowledge and the solution of problems related to human or veterinary health, agriculture, industry and to the environment, on a local, regional or national basis.</li> <li>3. Identify, assess, evaluate, and propose solutions to the identified problems of the specialty area.</li> <li>4. Generate and apply the appropriate instrumental and methodological techniques to obtain the required information and will have the ability to modify these techniques, if necessary, as well as to interpret the results generated and obtain conclusions from them.</li> <li>5. Efficiently communicate, orally and in writing, the results of their research in academic spaces and scientific media, as well as interaction with people from other areas of knowledge.</li> <li>6. Organize and plan activities related to the research and to manage the resources involved in the projects.</li> </ol>

	<ol style="list-style-type: none"> <li>7. Manage the resources necessary to develop the research project.</li> <li>8. Use computational tools to process data, analyze, synthesize, and interpret the results and prepare reports.</li> <li>9. Design and develop original scientific research projects independently.</li> <li>10. Identify, select and use different sources of information for research.</li> <li>11. Evaluate new, established and complex situations in the world of work.</li> <li>12. Spread knowledge with the support of the tutor.</li> <li>13. Propose projects to solve needs and problems.</li> <li>14. Conduct research projects.</li> <li>15. To train human resources for research and to teach.</li> <li>16. Work in multidisciplinary teams.</li> </ol>
<p><i>Attitude</i></p> <ol style="list-style-type: none"> <li>1. Availability to dedicate full time to the Doctorate (notarized commitment letter, interview).</li> <li>2. Interest in scientific research in the biological area (CVU, interview, knowledge test, EXANI III, letter of explanatory reasons, letters of recommendation provided by two recognized researchers who endorse their research experience).</li> <li>3. Willingness to work as a team (interview).</li> <li>4. Critical thinking regarding disciplinary phenomena.</li> </ol>	<p><i>Attitude in:</i></p> <ol style="list-style-type: none"> <li>1. Openness to new knowledge, but at the same time will be able to analyze it with scientific rigor.</li> <li>2. Aware of the enrichment generated by working in multidisciplinary groups and the importance of training new human resources involved in the same area.</li> <li>3. Favorable to the contribution of the advancement of science in the basic field, as well as the solution of practical problems to improve the living conditions of the inhabitants of the region in which it can influence.</li> <li>4. Favorable for working as a team, respecting ideas and contributions.</li> <li>5. Critical thinking regarding disciplinary phenomena.</li> <li>6. Intellectual honesty.</li> <li>7. Respect for ideas.</li> <li>8. Openness to changes.</li> <li>9. Commitment.</li> <li>10. Leadership and self-management.</li> </ol>
<p><i>Values</i></p> <ol style="list-style-type: none"> <li>1. Social commitment</li> <li>2. Autonomy.</li> <li>3. Responsibility.</li> <li>4. Tolerance.</li> <li>5. Professional and research ethics.</li> <li>6. Respect.</li> <li>7. Teamwork</li> <li>8. Honesty</li> </ol>	<p><i>Values</i></p> <ol style="list-style-type: none"> <li>1. Social commitment</li> <li>2. Autonomy.</li> <li>3. Responsibility</li> <li>4. Perseverance.</li> <li>5. Pluralism.</li> <li>6. Humanism.</li> <li>7. Quality.</li> <li>8. Equity.</li> <li>9. Equality.</li> <li>10. Tolerance.</li> <li>11. Professional and research ethics.</li> <li>12. Respect for intellectual property.</li> <li>13. Intellectual honesty.</li> </ol>

## VI. ADMISSION AND SELECTION REQUIREMENTS

### ADMISSION

#### *National Applicants*

1. Have a bachelor's degree in biological, chemical, agronomic, medical or related areas.
2. Have a minimum average of 8.0 in studies at the previous level.
3. Give the Doctorate Coordinator two letters of academic recommendation from research professors and/or research professors who know you.
4. Submit a commitment letter stating your availability to dedicate full time throughout the program.
5. Accredite the EXANI III exam with a minimum score of 1,000 points.
6. Accredite the TOEFL exam with 450 points; You will have a maximum of one year to achieve the 500 points established to remain in the program.
7. Present the Diagnostic of Graduate Skills applied by the Autonomous University of Aguascalientes (UAA).
8. Accredite the postgraduate knowledge exam.
9. Submit a Curriculum Vitae, which demonstrates having participated in national or international research conferences, having popular publications or indexed publications, and having participated in research projects (at least one of the three requested activities).
10. Deliver a letter of reasons with a maximum length of two pages.
11. Present the personal interview with the postgraduate Academic Council.
12. Submit all the administrative documentation requested by the UAA School Control Department.
13. Each applicant must fully comply with the process indicated by the university authorities at the time. Respecting the established dates. Late documents are not accepted.

#### *Foreign applicants*

1. Have a minimum average of 8.0 (or its equivalent) in the studies at the previous level, consistent with the training that the postgraduate degree will provide.
2. It is necessary to have the subjects of the previous level revalidated by the Ministry of Public Education.
3. Certificate of complete studies of the previous level (letter-size photostatic copy), apostilled or legalized.
4. Have a bachelor's degree in biological, chemical, agronomic, medical, or related areas. This must be accredited by presenting an apostilled and certified professional title, validated by the Department of School Control.
5. Professional license for practice in the Mexican Republic or document of authorization to practice the profession in the country where the studies were carried out (photostatic copy front and back letter size), apostilled or legalized.
6. Accredite the TOEFL exam with 450 points; You will have a maximum of one year to achieve the 500 points established to remain in the program. In the case of English-speaking applicants from abroad, they must take the DELE level B-2 exam; However, standardized certificates with international validity equivalent to the language may be accepted.
7. Give the Doctorate Coordinator two letters of academic recommendation from research professors and/or research professors who know you.

8. Present the Postgraduate Skills Diagnosis applied by the UAA.
9. Accredite the postgraduate knowledge exam. The design, application and modality are carried out by the Admission Committee proposed by the Academic Council.
10. Submit a Curriculum Vitae, which demonstrates having participated in national or international research conferences, having popular publications or indexed publications, and having participated in research projects (at least one of the three requested activities).
11. Deliver a letter of reasons with a maximum length of two pages.
12. Submit a letter of commitment to dedicate full-time to the postgraduate course.
13. Present a preliminary project related to the Lines of Generation and Application of Knowledge.
14. Meet with the Academic Committee to evaluate qualitative aspects of the admission profile. The modality in which the interview is carried out is determined by the Academic Committee.
15. Submit all the administrative documentation requested by the UAA School Control Department.
16. Each applicant must fully comply with the process indicated by the university authorities at the time. Respecting the established dates. Late documents are not accepted.

## GRADUATE

To obtain the doctoral degree, the following requirements must be met:

- Accredite all subjects, seminars and activities indicated in the study plan.
- Comply with complementary academic activities (optional credits and complementary activities) according to what is indicated in the study plan.
- Obtain a minimum overall grade point average of 8.0 (eight).
- Have at least two institutional identity courses.
- Present and accredite your predoctoral exam in a timely manner.
- Have at least one article accepted in an international indexed journal.
- Have your doctoral thesis reviewed and approved by the tutor committee in the last semester of the study program.
- Take the degree exam.
- Present and defend the degree work in a public degree examination and approve it in a timely manner as established in the Manual of postgraduate guidelines and procedures for the preparation of Thesis or Practical Work.
- Comply with what is indicated in the General Postgraduate Regulations and current institutional regulations regarding obtaining the degree.

Publication in an indexed journal. To demonstrate compliance with the published or accepted article requirement, students must choose one of the following options:

- a) Submit the published article in pdf format or complete copy of the journal in which it is published, in pdf format.
- b) Present an official statement of the final acceptance of the article by the editor of the journal.

For that student who obtains the acceptance of at least two indexed articles, *Summa Cum Laude* will be awarded.

*Summa Cum Laude* may also be obtained by the student who has the acceptance of an international indexed article and the registration of the patent application before the IMPI.

Grade test. It must be submitted at the end of the doctorate and will have the purpose of evaluating the thesis work carried out by the student (General Postgraduate Regulations). This exam will culminate with a public session at the end of which the jury will issue its decision, which will be irrevocable (General Postgraduate Regulations).

The requirements for it to be granted are (General Postgraduate Regulations):

- a. Have accredited all the courses and other activities indicated in the Study Plan.
- b. Have a minimum final average of 8 to pass the Doctorate.
- c. Prepare an original and unpublished traditional thesis.
- d. Have at least one published article derived from the thesis in a journal included in the Science Citation Index or in the Index of Mexican Scientific and Technological Research Journals of CONAHCYT.
- e. Check that you do not have any debt with the Autonomous University of Aguascalientes.
- f. Have covered the fee established by the Autonomous University of Aguascalientes in the excise tax plan.

The degree exam must be presented before a jury made up of the Tutorial Committee of the person supporting it plus two additional members (and two substitutes) designated by the Dean's Office (General Postgraduate Regulations).

## VII. STRUCTURE AND CURRICULAR ORGANIZATION OF THE PROGRAM

### Organization of the program

FORMATION AXIS	DESCRIPTION OF THE FORMATION AXIS
<b>Disciplinary</b>	They are mandatory subjects that delve into topics or content specific to the postgraduate course since their objective is to be a space where students develop and/or master their professional learning.
<b>Terminal</b>	<p>It is the set of seminars and subjects that allow the integration of knowledge for the development of the thesis, as well as the development of skills according to the level and orientation of the program.</p> <p><i>Optative.</i> These subjects may be taken inside or outside the institution, nationally or internationally, in person or online, between the first and third semester in the traditional modality and in the direct modality from the second to the fifth semester. They must be chosen by the student with the support of his or her tutor, with the approval of the Academic Council.</p> <p><i>Complementary activities.</i> They may be carried out between the fifth and eighth semesters in the direct modality and from the fourth to the fifth semester in the traditional modality and may be covered with participation in national and international conferences, national or international research stays, publications (book chapters, books, peer-reviewed journals). and indexed), among others determined by the Academic Council. The complementary activities are selected based on the student needs and requirements, which will depend on their thesis and the Lines of Generation and Application of Knowledge (LGAC) of the doctorate.</p>
<b>Institutional identity subjects and activities</b>	They are self-managed subjects taught in virtual mode by the UAA, from a catalog that will be offered permanently, which are a degree requirement, and must accredit a minimum of two courses. These will contribute to the comprehensive training of the student in accordance with what is established by the Institutional Educational Model.
<b>Retribución social</b>	Only students with a CONAHCYT scholarship must also carry out hours per week of social and academic remuneration activities, the first of which are related to activities that promote links with the different sectors that may be related to the thesis or practical work. In academics, the student must join in to carry out teaching, research, networking, and management activities for the benefit of the graduate program and/or in some area of the institution. These are coordinated by the Academic Council.

### Distribution of the program

Formation axis	N° of subjects	% of subjects	Credits	% in credits
Disciplinary	3	30%	53	18.93%
Terminal:				
-Seminar	7	70%	179	63.93%
-Optative	--	--	18	6.43%
- Complementary activities	--	--	20	7.14%
Grade test	--	--	10	3.57%
<b>Total</b>	<b>10</b>	<b>100%</b>	<b>280</b>	<b>100%</b>



## Curricular Map

Formation axis	Semester / Formation activities							
	First	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth
<b>Disciplinar</b>	Molecular biology cell biology Introduction to biological research							
<b>Terminal</b>		Research Seminar I (thesis progress)	Research Seminar II (thesis progress)	Research Seminar III (thesis progress)	Thesis I (thesis progress and preparation of 1st article)	Thesis II (thesis progress and preparation of 1st article)	Thesis III (thesis progress, follow-up of 1st art. and desirable elaboration of the 2 <sup>nd</sup> article)	Thesis IV (thesis progress and submission of 2nd article)
<b>Optatives</b>	<b>Optatives:</b> These subjects may be taken inside or outside the institution at a national or international level in person or online.							
<b>Complementary activities</b>	<b>Complementary activities:</b> They may be covered with participation in national and international conferences, national or international research stays, publications (book chapters, books, peer-reviewed and indexed journals), among others determined by the Academic Council.							
<b>Institutional identity subjects and activities</b>	They are self-managed subjects with no curricular value that must be taken at least two during doctoral training. These are taught online and are considered a graduation requirement.							

## VIII. PERMANENCE REQUIREMENTS

The requirements that students must meet to remain and continue with their postgraduate studies will be respecting the provisions of the current General Postgraduate Regulations of the Autonomous University of Aguascalientes, in addition to considering the following:

1. Attend classes to have the right to take the subjects in the ordinary exam. The number of absences with which the right to an ordinary or extraordinary exam is lost is considering the hours scheduled per week for each subject.
2. Each subject must be accredited in the ordinary period with a minimum grade of 7.0 (seven) or in an extraordinary exam, considering a single opportunity to pass the subject that is owed, this last element does not apply to the subjects of the research seminars or thesis.
3. Maintain a minimum overall average of 8.0 (eight), in addition to accrediting all subjects.
4. Have English accreditation with the required score.
5. The students deliver to the Academic Council a written report of the activities and progress, endorsed by the tutor. The report reflects the progress of the thesis, as well as the progress in fulfilling credits: electives and complementary activities. The dates for delivery of the report by the student will be indicated by the Academic Council and the assigned tutor.
6. For each student to remain in the postgraduate program, they must take into account the following cases in which, if they occur, they will be definitively dismissed from the program, in addition to what is established by the General Postgraduate Regulations and current institutional policies:
  - At the request of the student.
  - For not obtaining the degree within the period established in the General Postgraduate Regulations.
  - Not passing the predoctoral exam.
  - Not passing the degree exam.
  - Due to non-compliance with requirements established in the Institutional Regulations.
  - That the student presents serious misconduct or professional ethics towards the institution, tutoring, teaching, university staff, colleagues and/or causes intentional damage to university facilities.
  - For not passing the thesis progress seminars.
  - Not complying with or accrediting the stays or complementary activities recommended by the tutors, according to the study plan.
7. Participate in the International Multidisciplinary Congress of Scientific Dissemination
8. Carry out relevant social and academic remuneration activities if you are a scholarship recipient.

Based on the General Graduate Regulations of the UAA, the passing of a predoctoral exam is included as a requirement for permanence in the program. The student may take this exam for the second time, and only once, and if he/she does not pass it, on this second opportunity he/she will be permanently withdrawn from the program.

The purpose of the predoctoral exam is to evaluate the academic performance of each student in the Doctoral program.

The characteristics of the predoctoral exam are:

- A. Students entering from a bachelor's degree must take the predoctoral exam in the fourth semester of the program. The choice of the date will be made by the student himself or herself in agreement with his or her thesis tutor(s). Students who have entered the program with a Master's degree must take the predoctoral exam in the third semester of joining it.
- B. The presentation of this exam will be done before a jury made up of five synod members appointed by the Dean of the Center for Basic Sciences. The decisions made by this jury will be by majority. The requirements to be part of the jury are the same as those established for synods for the degree exam. The thesis tutor(s) will be part of this jury. The predoctoral exam jury will evaluate the following aspects of each student:
  - 1) Academic performance in the postgraduate course and acquired knowledge.
  - 2) Presentation and defense of the progress of your thesis project.
- C. The possible results of the predoctoral exam are: Accredited, Accredited with Recommendations or Not Accredited.
  - a) **Accredited Predoctoral Examination:** The student may continue with his or her doctoral program and his or her thesis project, assuming this requirement is met.
  - b) **Accredited Predoctoral Examination with Recommendations:** The student may continue with his or her doctoral program and his or her thesis project, but will have to attend to the recommendations made by the jury. These recommendations can refer to two aspects: 1) Modifications in the design of the thesis project, and/or 2) Need for the student to increase their knowledge in some area whose mastery is essential for the development of the thesis project and in which the jury has detected deficiencies during the predoctoral examination. The way in which the student will cover these deficiencies will be determined by the jury itself. Compliance with the recommendations made by the jury in the predoctoral exam will become an additional requirement for the degree exam to be granted.
  - c) **Non-Accredited Predoctoral Examination:** In this case, the student will not be able to continue the development of his or her thesis project; She will be able to take this exam a second time and if she does not pass it on this second opportunity, she will be permanently dismissed from the program. In no case may the student enroll in the seventh semester of the program without having passed the Predoctoral Exam (or in the second year if he or she entered with a Master's degree).

## IX. ACADEMIC STAFF

Grade	Name	Institution of the last degree	Academic staff	PRODEP	SNII	LGAC
<b>Toxicology and Environmental Bioengineering</b>						
D	Avelar González, Javier	CINVESTAV	Bioengineering and Environmental Toxicology	Yes	I	1. Environmental Bioengineering 2. Environmental Pollution 3. Cell Biology and Microbiology: response to the atmosphere
D	Guerrero Barrera, Alma Lilián	CINVESTAV	Bioengineering and Environmental Toxicology	Yes	II	1. Environmental Bioengineering 2. Environmental Pollution 3. Cell Biology and Microbiology: response to the atmosphere
D	Martínez Saldaña, Ma. Consolación	Universidad de Guadalajara	Bioengineering and Environmental Toxicology	Yes	I	1. Environmental Bioengineering 2. Environmental Pollution 3. Cell Biology and Microbiology: response to the atmosphere
D	Rico Martínez, Roberto	Georgia Institute of Technology, EUA	Bioengineering and Environmental Toxicology	Yes	III	1. Environmental Bioengineering 2. Environmental Pollution 3. Cell Biology and Microbiology: response to the atmosphere
D	Valdivia Flores, Arturo Gerardo	UC	Mycotoxins	Yes	I	1. Remediación de micotoxicosis 2. Producción y salud animal
<b>Chemistry and bioremediation</b>						
D	Chávez Vela, Norma Angélica	UAA	Chemistry and Bioremediation	Yes	I	1. Bioremediation 2. Organometallic chemistry and materials
D	Jáuregui Rincón, Juan	IBT-UNAM	Chemistry and Bioremediation	Yes	I	1. Bioremediation 2. Organometallic chemistry and materials
D	Medina Ramírez, Iliana Ernestina	Tulane University, E.U.A.	Chemistry and Bioremediation	Yes	II	1. Bioremediation 2. Organometallic chemistry and materials
<b>Plant and Animal Biotechnology and Biochemistry</b>						
D	Morales Domínguez, José Francisco	UC	Vegetal biotechnology	Yes	I	1. Biotechnology for the conservation and rational use of plant resources 2. Biotechnology for the improvement of cultivated plants
D	Pérez Molphe Balch, Eugenio Martín	CINVESTAV	Vegetal biotechnology	Yes	II	1. Biotechnology for the conservation and rational use of plant resources

						2 Biotechnology for the improvement of cultivated plants
D	Cervantes García, Daniel	UANL	—	NA	I	1. Animal biochemistry 2. Evaluation of prebiotics and probiotics in allergic diseases 3. Development of a preventive strategy against RSV (Respiratory Syncytial Virus) infection
D	Guerrero Alba, Raquel	IPICYT	Neuropharmacology and experimental therapeutics	Yes	II	1. Animal biochemistry 2. Neuropharmacology and experimental therapeutics (In training).
D	Marichal Cancino, Bruno Antonio	CINVESTAV	Neuropharmacology and experimental therapeutics	Yes	II	1. Animal biochemistry 2. Neuropharmacology and experimental therapeutics (In training).
D	Chávez Ortíz, Lucia Isabel	UAA	Biotechnology and Biochemistry	Yes	I	1. Plant Biotechnology
<b>Study of Proteins in Biological Systems</b>						
D	González Segovia, Rodolfo	UAA	Basic and Environmental Toxicology	Yes	--	1. Evaluation of the adverse effects produced by xenobiotics. 2. Monitoring of environmental contaminants and risk studies and environmental impact 3. Evaluation of adverse effects caused by pathogenic agents
D	Quintanar Stephano, Andrés	UNAM	Study of proteins in biological systems	Yes	III	1. Proteins in the immune response 2. Proteins in neuronal plasticity and secretion
D	Quintanar Stephano, José Luis	Universidad de Alicante, España	Study of proteins in biological systems	Yes	II	1. Proteins in the immune response 2. Proteins in neuronal plasticity and secretion
D	Romo Lozano, Yolanda	UAA	Basic and Environmental Toxicology	Yes	I	1. Evaluation of the adverse effects produced by xenobiotics. 2. Monitoring of environmental contaminants and risk studies and environmental impact 3. Evaluation of adverse effects caused by pathogenic agents.

D	Salinas Miralles, Eva María	Universidad de Alicante, España	Study of proteins in biological systems	Yes	II	1. Proteins in the immune response 2. Proteins in neuronal plasticity and secretion
D	Ventura Juárez, Javier	CINVESTAV	Study of proteins in biological systems	Yes	III	1. Proteins in the immune response 2. Proteins in neuronal plasticity and secretion
<b>Ecology and Biodiversity</b>						
D	Ocampo Acosta, Gilberto Alejandro	Claremont Graduate University, E.U.A.	Vegetal biotechnology	Yes	II	1. Ecology 2. Taxonomy
D	Silva Briano, Marcelo	Universidad Estatad de Gante, Bélgica	Vegetal biotechnology	Yes	I	1. Ecology 2. Taxonomy
D	Escoto Moreno, Jaime Antonio	Universidad Autónoma de Hidalgo	Biodiversity conservation	Yes	I	1. Conservation and management of natural resources
D	Sigala Rodríguez, José Jesús	Universidad Cornell	Vegetal biotechnology	Yes	I	1. Ecology 2. Taxonomy
D	José de Jesús, Luna Ruiz	Universidad de Arizona	Integrated ecosystem management	Yes	I	1. Conservation and management of natural resources 2. Production systems
D	Sosa Ramírez, Joaquín	Université de Montpellier II, Francia	Integrated ecosystem management	Yes	I	1. Conservation and management of natural resources 2. Production systems

D = Doctorate; M = Mastery; SNII = National System of Researchers; LGAC = Knowledge Generation and Application Line.

## **XI. PROGRAM FLEXIBILITY**

In accordance with the provisions of the UAA Educational Model, the General Postgraduate Regulations and the curricular guidelines for the postgraduate degree, the Curriculum Review Committee decided that the flexibility of the PE should favor the training of each student, through the following:

- Establishment of optional subjects that allow students to complete the credits with courses offered by the PE and according to their needs to strengthen the development of the thesis.
- For the development of the doctoral thesis, students can carry out mobility in the country or abroad, which favors the formation of collaboration networks between the members of the NA with different national and international institutions of recognized prestige in the areas of the Syllabus.

In both modalities, 18 optional credits must be covered in accordance with the provisions of the curricular map. The optional subjects, as well as the research activities, will be selected by mutual agreement between the student, tutor(s), or tutor(s).

In the case of the direct modality Doctorate, the optional courses will be carried out from the second to the fifth semester, while the complementary activities will be carried out from the fifth to the seventh semester.



## REDESIGN COMMITTEE MEMBERS

Mr. in C. Jorge Martín Alférez Chávez  
Dean of the Center for Basic Sciences

Dr. Francisco Javier Pedroza Cabrera  
General Director of Research and Postgraduate Studies

Dr. Juan Jauregui Rincón  
Research and Postgraduate Secretary of the Center for Basic Sciences

Dr. Alma Lilián Guerrero Barrera  
Coordinator of the redesign committee of the Doctorate in Biological Sciences

Dr. Norma Angélica Chávez Vela  
Member of the redesign committee of the Doctorate in Biological Sciences  
Department of Biochemical Engineering

Dr. Iliana Ernestina Medina Ramírez  
Member of the redesign committee of the Doctorate in Biological Sciences  
Department of Chemistry

Dr. Gilberto Alejandro Ocampo Acosta  
Member of the redesign committee of the Doctorate in Biological Sciences  
Department of Biology

Dr. Daniel Cervantes García  
Member of the redesign committee of the Doctorate in Biological Sciences  
Department of Microbiology

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