



# AUTONOMOUS UNIVERSITY OF AGUASCALIENTES

## MASTER IN CIVIL ENGINEERING

### PROGRAM<sup>1</sup>

#### I. PROGRAM IDENTIFICATION

Responsible academic center:	Center for Design and Construction Sciences
Responsible academic department:	Construction and Structures, Geotechnics and Hydraulics
Modality:	On-campus
Level:	Master's degree
Program orientation:	Program that specializes in the profession
Program engagement:	Exclusive time for those students with CONACyT scholarships and a grant from the University. Partial for active professionals.
Duration:	2 years (4 academic semesters)
Academic credits:	160
Kind of academic program:	Institutional program
Approval date by the HCU <sup>2</sup> :	June 2015

#### II. QUALITY CERTIFICATIONS

Nacional:	National Postgraduate System (SNP)
Nivel:	in Development

#### III. PROGRAM OBJECTIVE

To form professionals of a high academic level in diverse areas such as Environmental, Construction and Structures, with knowledge that allows them to implement and create innovative methodologies for their professional practice, as well as for solving problems inherent to the discipline, through planning, design, execution, construction and supervision of civil works and plumbing infrastructure, supported by the application or generation of knowledge for the economic development of the region and the country.

Date of actualization: December 2022

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

<sup>2</sup> Honorable University Council

#### IV. LINES OF RESEARCH

1. Structures and Construction
2. Applications of Earth Sciences to Infrastructure Projects

#### V. APPLICANT AND GRADUATE PROFILES

APPLICANTS	GRADUATES
<p><i>Knowledge:</i></p> <ol style="list-style-type: none"> <li>1. At the undergraduate level of civil engineering, architecture, or urban planning (knowledge exam)</li> <li>2. Acceptable basic computer programs (Office, AutoCAD, email, etc.) (interview)</li> <li>3. Translation of texts into English (EXANI III).</li> </ol>	<p><i>Knowledge in:</i></p> <ol style="list-style-type: none"> <li>1. Foundations of a solid scientific, methodological and technical training in the field of Civil Engineering.</li> <li>2. Within the legal framework for carrying out their work.</li> <li>3. Measurement, representation and systematization instruments of the phenomena involved that you must use in your projects.</li> <li>4. Basic methods and procedures of applied research and writing of technical-scientific documents such as essays and articles.</li> <li>5. Fundamental theories of Civil Engineering.</li> <li>6. Techniques of statistics and probability applied to engineering.</li> <li>7. Design and construction of Hydrosanitary Infrastructure works.</li> <li>8. New proposals for sustainable building materials.</li> <li>1. Proposed regulations on the subject of structural security for our country.</li> </ol>
<p><i>Skills</i></p> <ol style="list-style-type: none"> <li>1. To analyze problems and propose solutions. (EXANI III)</li> <li>2. Oral and written communication (interview, EXANI III and knowledge test).</li> </ol>	<p><i>Skills for:</i></p> <ol style="list-style-type: none"> <li>1. Apply the techniques and methodologies in solving problems.</li> <li>2. Generate knowledge using the scientific and methodological process.</li> <li>3. Identify relevant and pertinent information according to the study problem.</li> <li>4. Propose and solve problems of professional, work, and daily life in an original and creative way, through the design of innovative projects.</li> <li>5. Identify, analyze, and diagnose the problem under study and develop solutions and proposals.</li> <li>6. Search for relevant information.</li> <li>7. Design and improve technologies for civil engineering.</li> <li>8. Detect and monitor or measure the parameters involved in applied research.</li> <li>9. Investigate, quantify, model, and evaluate information for decision making.</li> <li>10. Carry out and defend projects, expert reports and studies carried out individually or as a team.</li> <li>11. Carry out expert reports.</li> </ol>

	<ol style="list-style-type: none"> <li>12. Carry out advisory and consultancy tasks around Civil Engineering.</li> <li>13. Use the computer and the basic and specialized software in at least one area of Civil Engineering.</li> <li>14. Use the most appropriate software, tools and technological applications and measuring devices to carry out their professional work.</li> <li>15. Communicate orally and in writing the results of applied research and technological development projects, to different actors and in a clear, orderly, and effective manner.</li> <li>16. Manage the new theories and calculation tools in at least one area of Civil Engineering.</li> <li>17. Actively participate with inter and multidisciplinary teams to solve problems.</li> </ol>
<p><i>Attitudes and values</i></p> <ol style="list-style-type: none"> <li>1. Be a responsible person and committed to their training (interview and knowledge test)</li> <li>2. Have an attitude of professional improvement (interview)</li> </ol>	<p><i>Attitudes and values in:</i></p> <ol style="list-style-type: none"> <li>1. Permanent search for knowledge to identify and solve problems in a timely manner.</li> <li>2. Awareness and responsibility of man as a transformer of nature in a context of sustainability.</li> <li>3. Openness in the integration of multidisciplinary groups.</li> <li>4. Self-learning and self-training.</li> <li>5. Service, responsibility, and social commitment.</li> <li>6. Willingness to continue professional updating.</li> <li>7. Sensitivity to the need to protect and improve the environment and preserve the delicate balance of biogeochemical cycles.</li> <li>8. Commitment to future generations in achieving sustainable development through their professional activity, in search of a better quality of life for humanity.</li> <li>9. Open to change.</li> <li>10. Liability.</li> <li>11. Adherence to the regulations for the care of what is sustainable.</li> <li>12. Respect for the ethical standards of applied and professional research work.</li> </ol>

## VI. ADMISSION AND SELECTION REQUIREMENTS

### Admission

1. Comply with the provisions of the current General Teaching Regulations.
2. Hold a personal interview with the Master's Academic Council.
3. Obtain the Pre-acceptance Letter from a Tutor belonging to the Basic Academic Nucleus.
4. Take and pass a basic knowledge test.
5. Present and approve the EXANI III of CENEVAL.
6. Pass a text comprehension test in the English language.

7. Letter of full-time commitment to the Master.
8. Delivery of the curriculum vitae of the applicant to the Technical Secretary of the Master.
9. If the CONACyT scholarship and the University subsidy are requested, the applicant must present a letter of commitment for exclusive dedication to the master's degree.
10. For applicants who do not request a scholarship, they must present a job letter demonstrating that they have active professional activity.

## VII. CURRICULAR ORGANIZATION AND STRUCTURE OF THE PROGRAM

### Program Organization

FORMATION AX	DESCRIPTION OF FORMATION AX
<b>Basic</b>	In this area, common core courses are offered. These courses have the purpose of making students aware of the theoretical and conceptual foundations of Engineering.
<b>Discipline</b>	The disciplinary area includes the professional courses that seal the specialty option chosen by the student. The program has three terminal options, which allow the student to determine their specialized field of professional work, through a set of disciplinary subjects, which may be chosen from among those indicated in the curricular map or among any other of the master's programs of the same center or others, from the country or abroad, always under the authorization of the Academic Council of the master's degree in Civil Engineering.
<b>Terminal and integral</b>	This area is made up of methodology subjects and thematic seminars, whose purpose is for students to know the foundation and process for the development of research in Civil Engineering. These professional seminars and professional activities are forums where students present the progress of their degree work to tutors and master's students with the purpose of receiving feedback to improve the quality of the work, as well as serve to validate the internships or professional practices that the students carry out and that contribute to the development of their final work.
<b>Optative</b>	This area favors student mobility, as well as helps to strengthen their professional training according to the specialty area and the LGAC.

## Curricular Map

Formation axes	1st Semester	2nd Semester	3rd Semester	4th Semester
<b>Basic</b> 29 Credits	<b>Probability and statistics</b> HT: 3, HP: 2 Credits: 8			
	<b>Engineering Software</b> HT: 3, HP: 2 Credits: 8			
	<b>Sciences of earth</b> HT: 3, HP: 2 Credits: 8			
	<b>Investigation Methodology</b> HT: 2, HP: 1 Credits: 5			
<b>Disciplinary</b> 42 Credits		<b>Disciplinary subject</b> HT: 2 HP: 3 Credits: 7	<b>Disciplinary subject</b> HT: 2 HP: 3 Credits: 7	<b>Disciplinary subject</b> HT: 2 HP: 3 Credits: 7
		<b>Disciplinary subject</b> HT: 2 HP: 3 Credits: 7	<b>Disciplinary subject</b> HT: 2 HP: 3 Credits: 7	<b>Disciplinary subject</b> HT: 2 HP: 3 Credits: 7
<b>Terminal</b> 61 Credits	<b>Research Seminar I</b> HT: 0, HP: 4 Credits: 4	<b>Research Seminar II</b> HT: 0, HP: 11 Créditos: 11	<b>Research Seminary III</b> HT: 0, HP: 15 Credits: 15	<b>Research Seminary IV</b> HT: 0, HP: 20 Credits: 20
		<b>Professional Activities</b> HT: 0, HP: 3 Credits: 3	<b>Professional Activities</b> HT: 0, HP: 4 Credits: 4	<b>Professional Activities</b> HT: 0, HP: 4 Credits: 4
<b>Optative</b> 18 Credits		<b>Optative I</b> HT: 2, HP: 2 Credits: 6	<b>Optative II</b> HT: 2, HP: 2 Credits: 6	<b>Optative III</b> HT: 2, HP: 2 Credits: 6
HT: Theoretical Hours per week, HP: Practical Hours per week				

## VIII. PERMANENCE REQUIREMENTS

1. Comply with the provisions of the General Teaching Regulations of this University.
2. Verify participation in the International Congress "Postgraduate Research" from the Autonomous University of Aguascalientes.
3. Verify the participation with a national or international presentation in an academic event suggested by the tutor(s).
4. Approve all the subjects of the study plan having a minimum average of 8.0.
5. Carry out professional activities.

## IX. GRADUATION REQUIREMENTS

1. The provisions of the General Teaching Regulations will be complied with in order to obtain the master's in civil engineering.
2. Students will prepare a terminal project (practical work, thesis, or technological development) as a result of their experience and permanence in their professional stay, which they must present and defend in their degree exam in a time no greater than six months after completion of studies, in such a way that the degree is obtained in 2.5 years maximum.
3. The name of the degree obtained will be master's in civil engineering, specifying the terminal area.

## X. NÚCLEO ACADÉMICO BÁSICO

No	Nombre	Grado máx	Lugar donde se obtuvo el grado	Dedicación/ Nivel S.N.I.	Perfil PROMEP	Cuerpo Académico	LGAC
1	Mario Eduardo Zermeño de León	Doctorado	INSA(Francia)	PTC/ --	Sí	Sí	EyC
2	Jesús Pacheco Martínez	Doctorado	UNAM	PTC/ Candidato	Sí	Sí	EyC ACTPI
3	José Ángel Ortiz Lozano	Doctorado	UPC (España)	PTC/ Nivel I	Sí	Sí	EyC
4	Gerardo Araiza Garaygordóbil	Doctorado	UPC (España)	PTC/ --	Sí	Sí	EyC
5	Sergio Ignacio Martínez	Doctorado	U.T. (EUA)	PTC/ --	Sí	Sí	ACTPI
6	Martín Hernández Marín	Doctorado	V.T. (EUA)	PTC/ Candidato	Sí	Sí	ACTPI
7	José Luis López López	Maestría	UAA	PTC/ --	Sí	Sí	ACTPI
8	Daniel E. Reyna Valdivia	Maestría	UAA	PTP / --	-	Colaborador	EyC
9	Miguel Ángel Soto Zamora	Doctorado	UAA	PTC / --	-	Colaborador	EyC
10	María Guadalupe Lira Peralta	Maestría	UAA	PTP / --	-	Colaborador	ACTP
11	Jorge Antonio Rodríguez Martínez	Maestría	UAA	PTP / --	-	Colaborador	ACTPI

LGAC = Líneas de Generación y Aplicación del Conocimiento. EyC = Estructuras y Construcción.  
ACTPI= Aplicaciones de las Ciencias de la Tierra a Proyectos de Infraestructura.

## **XI. PROGRAM FLEXIBILITY**

The flexibility of the master's in civil engineering is demonstrated as follows:

- The optative subjects may be selected from among those proposed by the different areas of the program with the approval of the tutor and depending on the academic-financial possibilities of the institution.
- The optative subjects may be carried out in another postgraduate course of the University or even, in a postgraduate course external to the UAA (if it is National, preferably in the PNPC), favoring with this, the mobility of the student.
- Students may also choose to carry out internships and/or professional practices in different public or private institutions, as long as they complement their training approach according to their area of expertise, and the reception work being carried out, which will be evaluated by the tutor and approved by the Master's Academic Council.
- Serial subjects are not raised. The only ones that have a series are the professional seminars.

**Explanatory note:** *The optative subjects implemented within the Master's in Civil Engineering, will be proposed by the Academic Council for all students by terminal area and for each semester as appropriate and to be able to offer it there must be at least 10 permanent students enrolled in the subject within order to avoid raising the cost for the institution.*



**Dr. Francisco Javier Avelar González**  
Rector

**Dra. Guadalupe Ruiz Cuéllar**  
General Director of Research and Postgraduate

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Head of the Postgraduate Support Department

**M. en Val. Manuel Andrei Murillo Méndez**  
Head of Construction and Structures Department

**M. en V.F. Humberto Castañeda Molina**  
Head of the Department of Geotechnics and Hydraulics

**M. en Ing. José Luis López**  
Curricular Work Coordinator

**Dr. Martín Hernández Marín**  
Professor of the Specialty area in Structures

**Dr. Gerardo Araiza Garaygórdobil**  
Professor of the Specialty area in Construction

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