INSTITUTIONAL CATALOGUE 2013 - 2016

UNIVERSIDAD DE LAS AMERICAS PUEBLA

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HISTORY

Universidad de las Américas Puebla was founded in 1940, in the nation's capital and was named Mexico City College. To clearly reflect the brotherhood between the United States and Latin American countries, at the start of the 60s, it changed its name to University of the Americas. By then, the prestige of its professors and research projects, as well as the understanded Archeology program in Oaxaca, positioned it abroad and in Mexico as one of the best options for young people who wanted an excellent education with a bi-cultural vision.

In 1966, the Fundación Mary Street Jenkins provided the funds to move the university to Cholula, in the Santa Catarina Mártir hacienda, with over 80 hectares, located between the Popocatépetl and Iztaccíhuatl volcanos. Under its new name, Universidad de las Américas Puebla, with an innovative educational project that included opening not only the School of Art and Science, but the School of Engineering, and the School of Business, it received the support and official recognition of the federal Secretary of Public Education, the Southern Association of Colleges and Schools Commission on Colleges - SACSCOC, as well as business and government sectors of the region.

In 1985, the Universidad legally and ideologically separated from the Civil Association in Mexico City, and was now known as: Fundación Universidad de las Américas Puebla. It was established with the philosophy: education with humanistic, scientific and universal spirit, as well as academic excellence and teaching freedom. It consolidated as the most important private education institution in the country.

At UDLAP, history has taught us that an active conscience and community participation is important to guarantee success in every member. Therefore, each of its accomplishments in different areas and fields of knowledge position it as a leading institution. In this sense, we cannot think of Universidad de las Américas Puebla without recalling, at the same time, the great accomplishments of its Aztecas representative teams, who have prevailed, since its foundation, in the following areas: football, soccer, taekwondo, basketball, tennis, female and male athletics. Its participations have made it the leading institution in CONADEIP's Premiere League.

Aztecas have also performed in the cultural environment, offering society shows of impeccable artistic execution, such as: traditional dance, dance, chamber music, opera, theater, cinema, fine arts, to name some of the most relevant activities within its installations and cultural extensions, such as Chapel of Art in downtown Puebla.

The classrooms of the five UDLAP Schools (Social Science, Humanities, Engineering, Science, and Business and Economics) that have in the last years modernized in the last years to meet the technological and scientific advances have housed, since then, seventy-seven generations who have stood out in the world because of their achievements in research, diffusion and consulting. The modern labs, classrooms, sports facilities, library, information technologies, and residential colleges have created a favorable and privileged environment to study and develop.

PROFILE OF THE INSTITUTION

ORGANIZATIONAL STRUCTURE

Fundación Universidad de las Américas Puebla's governability is defined in its Organic Statutes, which recognizes the Board of Trustees as the authority to guard the University's heritage. This Board also has the final say in the selection of the president.

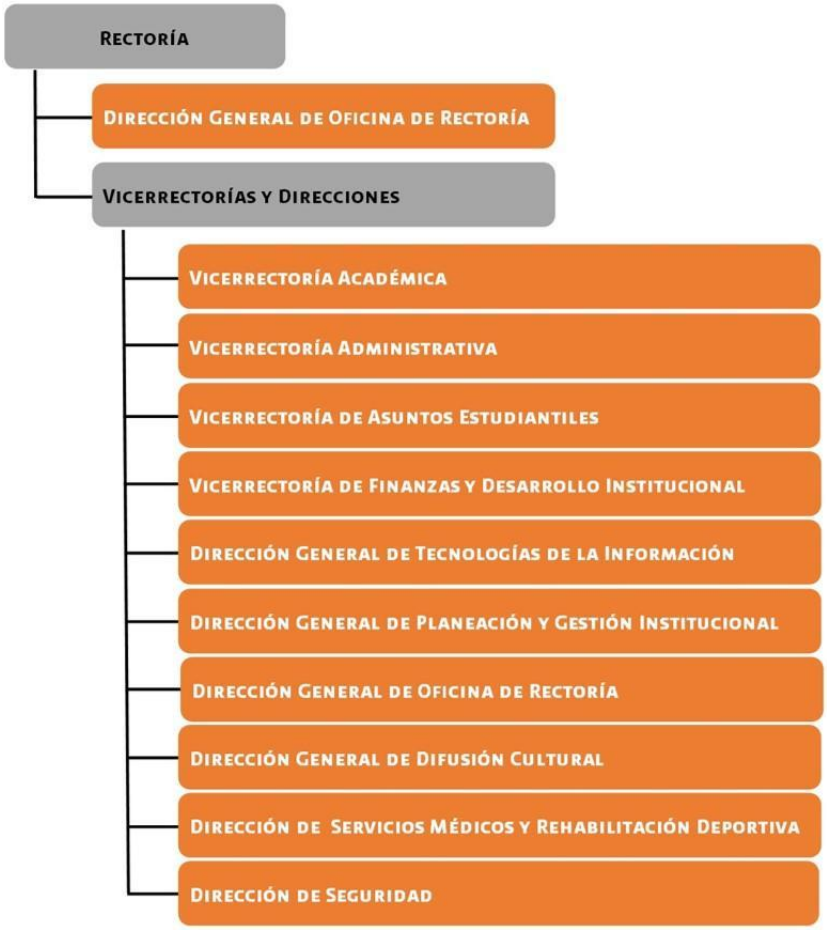
The Business Council is a collegiate entity that decides, cares for and guards the institution's integrity and the adequate use of resources. This Council follows the strategic plan, and the actions and goals reached by UDLAP, understanding the impact they have in meeting the university's mission and safekeeping ethical and financial interests.

The Academic Council is a legislative entity on academic issues, and the Administrative Council is a legislative entity regarding administration. Both are recognized by Fundación Universidad de las Américas Puebla's Board of Trustees.

UDLAP INSTITUTIONAL ORGANIZATION CHART

The institution has developed its organizational structure to create a university identity and philosophy with which to reach its objectives, regulate the influence of individuals on the organization, and define decision-making within the structure. Therefore, the university has the following organization chart:

The Business Council will propose candidates to the Board of Trustees, who will name the President on whom the authority and faculty to carry out activities as Chief Executive will be delegated.



**Institutional Organization chart of the UDLAP used since 2011*

PHILOSOPHY

UDLAP's institutional philosophy is defined from the vision that the institution pursues, giving life to its current mission. This mission is divided into strategic guidelines, whose objectives and goals should be oriented according to the key principles promoting an action based on its values.

MISSION

To participate in the development of society by training critical, creative and innovative professionals who are highly trained and driven to perform relevant research. All of this with the social conscience that demands an equitable distribution of globalization's benefits

VISION

To be the leading university in Latin America in study programs and scientific, cultural, sports and public policy programs, that answer the challenges presented by globalization

VALUES

The values that distinguish the conduct of UDLAP community members are:

- **FREEDOM WITH RESPONSIBILITY**

  University members will act with independence and creativity, responsibly practicing freedom of thought, research and expression. The university community will promote research and teaching freedom as pillars to create knowledge.

- **TOLERANCE AND NON-DISCRIMINATION**

  Genuine knowledge is created and shared only in an environment of respect for others, their opinions and diversity. Therefore, the university community will seek plurality in an atmosphere of respect, strictly rejecting any type of discrimination motivated by ethnic or national origin, gender, age, disabilities, social or economic condition, health conditions, religion, opinions, preferences, marital status or any other that violates human dignity.

- **HONESTY AND INTEGRITY**

  Members of the university community are committed to seeking justice, building on it and acting righteously.

- **SOLIDARITY**

  The university community will participate in joint actions that favor its community and environment.

- **TRANSPARENCY**

  Members of the university community are committed to sharing knowledge, according to their own activities, and truthful, complete, clear and opportune information and using sharing mechanism appropriate for the circumstances.

GUIDELINES

The seven guidelines that support the mission and the institutional vision are:

- Relevant study programs
- Prestigious faculty
- Research and artistic creation

- Excellent students
- Outreach
- Administrative efficiency
- Vanguard facilities

PRINCIPLES

The principles refer to the orientation with which the objectives, actions and collective goals should be raised in the University, these principles are as follow:

- **QUALITY PHILOSOPHY**
  Objectives consider our quality philosophy, whose execution is characterized by service, promoting a continuous improvement culture that reaches the established goals in each strategic guideline.

- **INTERNATIONALIZATION**
  The focus of the objectives contemplates global actions to promote multiculturality and strengthen the university's prestige beyond its borders.

- **SOCIAL RESPONSIBILITY**
  Objectives are defined around ethics, social commitment, and environmental responsibility.

OUR CAMPUS

Our campus is known for being one of the most diverse and green in the area. To date, it has 80 hectares, of which, 50.61 are green areas. Not only that, in UDLAP we have spaces so you can develop your activities safely.

Since its foundation Universidad de las Américas Puebla has been a meeting place of notable personalities of the academic, artistic, political, cultural and business world, who have found in UDLAP the ideal place to teach, create, study, learn and share.

Universidad de las Américas Puebla has great international prestige in different areas such as: science, engineering, scenic and fine arts, humanities, business and economics, among others.

At UDLAP, students and professors join the continuous change of the times. The true way to experience this is visiting our campus, walking in its gardens, talking with students and professors, and visiting the classrooms, labs, residential colleges, sports facilities, libraries, computer rooms and cafeterias.

BUILDINGS

Our campus is known for being one of the most diverse and green in the area. To date, it has 73.2 hectares, of which, 50.61 are green areas.

Not only that, in UDLAP we have spaces so you can develop your activities safely. Among these you will find:

PERFORMING ARTS ROOM

This expression area includes audio and lighting, seating, a stage, dressing rooms, storage, ticket office, and workshop.

LIBRARY

For your days and nights of studying, our library, as well as comfortable, fuses the traditional with on campus and online information services. There are 4 multimedia collaboration rooms and 3 bibliographical teaching rooms with computers, as well as cubicles for individual and group studies.

LABS

As part of your academic formation, we have science, health science, mechanical and industrial engineering, electronic engineering, telecommunication and water treatment labs. We also have a language learning complex, oral hearing room, financial simulation room, projection room, qualitative and innovation research labs, marketing and retail qualitative research rooms, a Gesell chamber, a mobile app lab as well as photography, television, dance and music labs and a 3D printer. We also have a lodging lab better known as San Andrés Hostel, open to the UDLAP community and overseen by students of the corresponding areas.

AUDITORIUM

The best place for congresses, plays and other events. Located in the center of campus, it is the most popular meeting area. It will be difficult for you to not find activities in it.

COMPUTER ROOMS

UDLAP has macro computer rooms with latest generation equipment at your service, with specialized software according to your needs. You may use these rooms 24 hours a day, 7 days a week.

You can locate them in:

- Business and Economics: NE-137
- Arts and Humanities: HU-224
- Science: CN-106

MEDICAL SERVICES

To assure your wellbeing and physical health, we have a clinical analysis center and medical services that provide free service to community members who need it.

UDLAP has a comprehensive rehabilitation center (CIR), which provides medical care in orthopedics, joint surgery, sports medicine, rehabilitation medicine, physiotherapy, nutrition and physical preparation, with the latest in scientific and technological knowledge, always looking for innovation.

STUDENT CENTER

This is the preferred meeting place for the UDLAP community. It has services and activities that will keep you busy during your free time.

Here you will find from food services to office supplies, projection rooms or student organization offices.

SPORTS FACILITIES

Concerned with your academic and physical development, we have sports facilities that you may access daily to care for your physical wellbeing.

You will find:

- Pool
- Baseball field
- Futsal field
- Basketball courts
- Tennis courts
- Integral Rehabilitation Center
- Basketball court at the Moe Williams Gym
- Weight room
- Track and field
- American football field, Templo del Dolor
- Soccer fields

RESIDENTIAL COLLEGES

Equipped with dorms, projection rooms, auditoriums, cafeterias, among others, we have designed these spaces so you can live comfortably on campus. You may choose one of the four colleges, Cain-Murray, Ray Lindley, Ignacio Bernal, José Gaos.

GREEN AREAS

Ideal to relax, share with your friends and carry out activities, which make it some of the favorite areas for the UDLAP community.

Among them you will find: the lake, the bonfire and meditation gardens, the couple's garden, the main fountain, and Flag Plaza. All these areas are meeting and coexistence points for the university community.

ACCREDITATIONS

Universidad de las Américas Puebla teaches study programs with excellent academic quality through its faculty, that consists of 300 full-time professors, 95% of whom have graduate degrees, and 4 of 10 professors belong to the National Researcher System.

UDLAP gears its efforts in providing high quality educational services, through an integral formation of its students in a multicultural environment based on respect and international understanding.

All study programs have Official Validity (Reconocimiento de Validez Oficial - RVOE) granted by the Secretary of Public Education and are recognized by different universities in Latin America, Europe and the US educational system.

Our students may study abroad and widen their horizons or do professional practices in other countries, making their formation and professional development wider and more varied.

Also, we have Licenciatura Accreditation from COPAES (Consejo para la Acreditación de la Educación Superior, A.C.), CIEES (Comités Interinstitucionales para la Evaluación de la Educación Superior, A.C.) and other international agencies.

SACSCOC

Fundación Universidad de las Américas, Puebla is accredited by the Southern Association of Colleges and Schools - Commission on Colleges to grant licenciatura, master and doctorate degrees. Contact the Commission on Colleges by mail (1866 Southern Lane, Decatur, Georgia 30033-4097, EUA) or by phone (+1 404 679 4500) to request more information on Fundación Universidad de las Américas Puebla's accreditation.

FIMPES

Fundación Universidad de las Américas, Puebla has, before the admission and permanence system of FIMPES through institutional development, accredited affiliation, for its campus located in Ex Hacienda Santa Catarina Mártir, 72820 San Andrés Cholula, Puebla.

INTEGRAL STUDENT DEVELOPMENT

ART AND CULTURE

We promote all kinds of culture! From theater, dance and painting, as well as singing, music and sculpture. UDLAP offers its community and the public, numerous presentations and artistic shows throughout the year, always looking to highlight different cultures and customs that coexist on campus.

SPORTS

Our sports students are an example of discipline, attitude, strength and work. The six sports representative teams that make up our university are always in the first places in their competitions, showing the meaning of being an UDLAP Azteca.

STUDENT LIFE

The university is not only a place to go to school. The experience and learning of coexisting with different lines of thought and participating in integration and recreation activities, contributes to the integral development of the university community. UDLAP offers academic and cultural trips, business visits, bike tours, cinema club, and student organizations.

SOCIAL COMMITMENT

It is in university life that one builds knowledge, and therefore, at UDLAP, daily life is also constant learning. We want our students to be good citizens who are humanistic and tolerant of leadership and success, with equal opportunities in their environment.

INTERNATIONAL EXPERIENCE

UDLAP offers the opportunity to live an international experience through our diverse programs: academic exchanges, dual programs, language summers, academic summers and professional practices abroad.

OUTREACH WITH BUSINESSES (PROFESSIONAL PRACTICES)

The Department of Professional Practices promotes and supervises the relationship between the UDLAP student and organizations that offer professional practice projects in Mexico. Their main functions are:

- Establish agreements and collaborations.
- Promote professional practices projects with the university community.
- Manage and supervise student-organization outreach.
- Mediate and solve conflicts.

ADMISSIONS

ADMISSION PROCESS

1.- Create your profile

Create your unique user account and start your admission process.

2.- Present your entrance exam

Know the dates of the entrance exam on campus and register on the date you want to attend, or check the dates on which we will visit your city and schedule your appointment. See the guide to present it.

3.- First delivery of admission documents

Once you have passed the entrance exam, you can continue with the admission process and obtain your student number. To do this, you must fill out the application and submit a simple copy of your birth certificate or CURP; as well as an original transcript of your licenciatura or equivalent.

Licenciatura with additional admission requirements

If you plan to study the licenciaturas in International Business Administration, Dance or Medical Surgeon, there are additional requirements that you must meet.

Consult the requirements at: https://udlap.mx/eligeudlap/requisitos-adicionales.aspx

4.- Make your first payment and you will receive your class schedule*

Make the payment of 6 units (in the cases that apply).

** You will receive your course schedule one the early registration period begins.*

STUDY EQUIVALENCY AND REVALIDATION

Equivalency is an educational authority's administrative act or ruling that the institution's studies are equivalent to studies carried out in the National Education System.

Revalidation is the administrative act before an authorized educational authority, that grants official validity to studies done abroad, if they are comparable with studies in the National Education System and correspond to courses in the university's study program.

A comparison study determines which courses are accredited in the study program through equivalence or revalidation. This process has a fee for the student, which you can find on the university's webpage.

You may accredit courses with passing grades according to what is indicated by the education authorities.

The student has a maximum of 80 days from having started their first term at the university to hand in the required documents.

Equivalencies (national institutions) at the licenciatura level, deliver the following documents:

A. Study program of the licenciatura, duly sealed.

B. Syllabus of each of the courses considered for equivalency, duly sealed.

C. Original certificate of the partial studies at the university.

Equivalencies (national institutions) for master's program, deliver the following documents:

A. Graduate study program, duly sealed.

B. Syllabus of each course considered for equivalency, duly sealed.

C. Original certificate of partial studies at the university.

D. Notarized licenciatura professional license.

E. Certificate of licenciatura studies.

Revalidations (foreign institutions) at the licenciatura level, deliver the following documents:

A. Transcript or university certificate, physical or electronic, duly sealed.

B. Study program, duly sealed.

C. Syllabus of each of the courses considered for revalidation, duly sealed.

In case the documents are not in Spanish, you must deliver a simple translation of them.

Revalidations (foreign institutions) at the master's level, deliver the following documents:

A. Transcript or university certificate, physical or electronic, duly sealed. In case the documents are not in Spanish, you must deliver a simple translation of them.

B. Study program, duly sealed.

C. Syllabus of each of the courses considered for revalidation, duly sealed.

D. Notarized licenciatura professional license.

E. Certificate of licenciatura studies.

In case the documents are not in Spanish, you must deliver a simple translation of them.

SCHOOL SERVICES

The Department of School Services is an area to attend students, from their admission process, during their studies and until the graduation process.

Hours of operation: Monday to Friday from 8:30 to 17:00.

For extended hours request an appointment 24 hours in advance to the following email: serviciosescolares.posgrado@udlap.mx

More information: www.udlap.mx/serviciosescolares

INSTITUTIONAL SCHOLARSHIPS

These are financial aid granted to students who request it, considering academic, sports, art performance with no retribution for UDLAP (they are not credit loans).

It is indispensable to hand in the scholarship application in the dates established and enroll in the "early registration" period, according to the semester you are entering (January or August 2020), if you meet the requirements.

The main student commitment is to maintain their academic quality.

It is important to understand and meet the general and specific guidelines, as well as the scope, benefits and obligations of the scholarship you are interested in.

IMPORTANT ASPECTS

The scholarships only apply to new students.
Scholarships are not cumulative.
The scholarship application process does not guarantee that you will receive it, as it is subject to the corresponding valuation by UDLAP.
Late applications will not be accepted, nor incomplete documentation or that which does not meet with the requirements of the corresponding scholarship.

When you receive the scholarship, it is mandatory to meet what is indicated in the Institutional Scholarship regulations.

More information: www.udlap.mx/becas

GRADUATION AND DIPLOMAS

GRADUATION

Steps to follow:

- Enroll in Thesis II or its equivalent.
- Meet with your Academic Department Head or Coordinator to see the advance in your study program, to guarantee that it is 100% finished.
- Deliver the Diploma Option in the Academic Department, who will validate and deliver (if applicable) the documents to School Services.
- Hand in the proof of payment in the Graduation Area in the Center of Student Community Attention, where you will fill out your Graduation Application to start the process.
- You will be notified on your university email if the documentation is complete, and you will schedule an appointment to sign the official document and diploma.

- Answer the Student Satisfaction Survey.
- Finish your Social Service (only Licenciatura)
- Not have any debts (tuition, UDLAP lottery, library, labs, scholarship service hours, etc.)
- Present the Professional and/or Grade Exam if it's the Graduation Option you chose.

DIPLOMA

- Input the information for your diploma.
- Review the information and application of physical diploma.
- Receive and review the PDF file before it is printed.
- Request the final printing.
- Request payment from the corresponding area.
- If it is a state process, hand in the SEP offices the file with the following documents: title, birth certificate, CURP, transcript, exam act, letter to the governor, payment of the federal or state offices, as applicable.

To register your diploma and receive your professional license, you must go to the offices of the General Professions Department in Mexico City:

PROCESS AREA/ELECTRONIC VALIDATION (MEXICANS WITH MEXICAN STUDIES)

- Hand in the files for Professional License processes.
- Review and receive professional licenses.

AUTHORIZATION AND REGISTRATION /FOREIGNERS AND MEXICANS WITH STUDIES ABROAD

- Enter the files for Professional License process.
- Review and receive professional licenses.
- The file must contain the following documents:
- Diploma, birth certificate, CURP, transcript, exam act, professional license application, payment. (original and copy).

COSTS

TUITION

For students to enroll they must pay the tuition.

- Licenciatura - 6 units at the current cost.
- Trimester graduate studies - 4 units at the current cost.

The tuition cost is determined by multiplying the number of enrolled academic units by the current cost per unit. Each course has a defined number of units.

All information regarding payments and tuition is found at: https://www.udlap.mx/pagosycolegiaturas/

REFUNDS

If you have a credit balance, you may request the refund if said balance is due to excess payments.

For refunds you must go to Unicaja in the Treasury Department, located in building 1 office 109 to deliver the necessary documentation in the dates established in: https://www.udlap.mx/pagosycolegiaturas/reembolsos.aspx

The procedure is as follows:

1. **Refund application, for which you must meet the following requirements:**
   - Letter to the Treasury Department that specifies the reason why there is a credit balance.
   - Request the application (only the shaded lines, also available at Unicaja).
   - Copy of official identification (Credencial de Elector or passport), present original for comparison.
   - For refunds greater than $20,000.00 pesos, you must present a letter of authorization from the parent or guardian who is registered in School Services, copy of their identification and contact information.
   - For refunds greater than $100,000 pesos, you must present a letter of resource provenance.
   - If the student cannot do this process personally, the person who represents them must have a simple proxy letter and copy of identifications of both parties.

2. **Refunds.**
   - Once your refund has been authorized and after 15 working days at most, you may go to the cashier located in building I, office 109, from 8:00 to 13:00 and 15:00 to 16:00.
   - If your refund is less than the equivalent of one unit at the current fee, it will be given in cash. Please bring your official ID.
   - Amounts larger than the amount stated above will be issued a cashier's check, which means you must deposit it in your account.
   - If you cannot go personally for your refund, you may request direct deposit, sending a copy of your account statement that includes the account number under your name.
   - If the refund is due to application of study units (UDES) or future student units (UFES), the refund will have a 10% administration fee.
   - If the refund is due to scholarships, education credits or lottery incentives, it will not apply.

WITHDRAWING FROM UDLAP

In case of temporary or definitive withdrawal from UDLAP, the student must cover the total tuition cost of the enrolled period, unless the withdrawal is in the times specified below. The withdrawal procedure must be done in the Student Community Attention. Center

The number of days to calculate the waiver considers the first official day of classes of the academic period, and the date the process is started in the Center of Student Community Attention.

SEMESTER TERM

From the 1st to the 5th day of classes	**100% Waiver**
From the 6th to the 10th day of classes	**70% Waiver**
From the 11th to the 14th day of classes	**40% Waiver**
After the 15th day of classes	**0% Waiver**

TRIMESTER OR SUMMER

From the 1st to the 2nd day of classes	**100% Waiver**
From the 3rd to the 5th day of classes	**70% Waiver**
From the 6th to the 7th day of classes	**40% Waiver**
From the 8th day of classes	**0% Waiver**

** Applicable only for tuition.*
** New students must meet the current regulations.*

Regulations

At the University of the Americas Puebla Foundation, we have policies, regulations and procedures that any member of the UDLAP Community must observe to create an environment of healthy coexistence, respect and collaboration to benefit personal and professional growth, in congruence with the institutional mission.

Students at Fundación Universidad de las Américas Puebla have the obligation to direct in their actions with responsibility in the achievement of a comprehensive training and academic excellence.

Student regulations: https://www.udlap.mx/serviciosescolares/normatividad.aspx

ALUMNI COMMUNITY

The Alumni Department's objective is outreach with the largest UDLAP community, which are its over 30,000 alumni. They are fundamental, as they represent the university in the work force. They also support the creation of new spaces in professional and social fields, that contribute to the positioning of Universidad de las Américas Puebla.

The Office of Alumni Outreach works with other UDLAP areas to receive suggestions from alumni and the public. We are focused on providing a service to all graduates, from licenciatura and graduate studies. We want to strengthen, consolidate and stimulate relations with UDLAP graduates, while we promote their integration and sense of belonging, to promote their personal and professional development.

We let them know the benefits of being UDLAP alumni and maintain and consolidate a graduate-institution link. We keep their information regarding workplace and activities updated, promoting their participation in events or inviting them to publish a research article in Contexto or current interest articles in (Visión ExaUDLAP).

VISIÓN EXAUDLAP MAGAZINE

A university's prestige comes from its alumni. It is they who, through their actions, reflect the result of work and effort. Being a graduate from Universidad de las Américas Puebla, you acquire the commitment to strengthen what for generations has understanded the university: graduates with critical thinking who can face problems and compete in a global environment. Bringing our graduates closer to their alma mater and building a community requires efforts from everyone. Being exaudlap means being an active part of the university community. Having our graduates close strengthens us and contributes to consolidating our university and thus transform the country.

UDLAP will continue working on making our alma mater a center of integral development, shaping young people's future and educating critical individuals who benefit the immediate social context.

We reiterate our interest in keeping you close to your alma mater and invite you to participate in the different outreach spaces we have. We thank you for your enthusiastic participation in making this magazine possible, and for allowing us to share with you the achievements, successes and challenges of the alumni communit

EDUCATIONAL OFFER

D DE LAS AMERICAS PUEBLA

MASTER IN PRIMARY EDUCATION

MEB5011 EDUCATION TECHNOLOGY

At the end of the course, the student will be able to use applications that have an easy handling of information and communication, as well as develop multimedia educational materials to achieve meaningful learning.

MEB5041 PROFESSIONAL DEVELOPMENT AND RESPONSIBILITY IN EDUCATIONAL PRACTICE

At the end of the course, the student will be able to apply various didactic strategies that favor professional development within the classroom and within a framework of professional responsibility for teaching the delivery of education, as well as reflect on the moral requirement of educational practice and the intervention of judgments and personal values, with the intention of achieving professional identification in a quality educational service.

MEB5021 TEACHER LEARNING ANALYSIS

At the end of the course, the student will be able to recognize and enhance their learning process as an adult and thereby appropriate the necessary tools to transform their teaching practice, applying appropriate techniques, using the support of educational software. You will also properly handle conflicts and make assertive decisions.

MEB5131 EDUCATIONAL LEGISLATION

At the end of the course, the student will be able to analyze, distinguish and explain the various laws and constitutional regulations that have a direct impact on education, as well as the various regulations on education, to maintain the legal trajectory of education, acquiring a clear vision of the current educational model.

MEB5031 EDUCATIONAL PROJECT DESIGN

At the end of the course, the student will be able to design, implement and evaluate effective work projects, considering the contextual factors that influence the learning of human beings in order to achieve better rates of educational achievement.

EMPHASIS ON PEDAGOGICAL TEACHING SKILLS

MEB5091 INCLUSIVE BASIC EDUCATION AND CLASSROOM DIVERSITY

At the end of the course, the student will be able to develop the understanding of educational processes, with a reflective and critical vision of theory, practice and research, in the field of attention to diversity and inclusive education.

MEB5101 BASIC EDUCATION AND EDUCATIONAL THEORIES

At the end of the course, the student will be able to identify and analyze the object, methods and auxiliary sciences of education, in order to deepen the knowledge of the main theoretical foundations, identifying their main exponents, characteristics and approaches.

MEB5111 BASIC EDUCATION EVALUATION

At the end of the course, the student will be able to achieve the conceptualization of the educational evaluation under different perspectives, from their own experience and the analysis of the context.

MEB5121 BASIC EDUCATION CLASSROOM LEARNING

At the end of the course, the student will be able to analyze the processes of psycho-social development of students in the main stages of their development and reflect on the historical, socioeconomic and cultural factors that influence human learning, as well as the main theories that explain it.

MEB5251 DEVELOPMENT OF TEACHING SKILLS IN BASIC EDUCATION

The basic education professional, through the study of the competence-based approach, will apply in the classroom a pedagogy that builds knowledge, know-how, know-how to be and know-how to coexist, in order to promote the improvement of the main learning of their students.

EMPHASIS ON EDUCATIONAL INSTITUTION MANAGEMENT

MEB5171 BASIC EDUCATION INSTITUTIONAL DIAGNOSIS

At the end of the course, the student will be able to develop competencies that allow him to recognize in the institutional diagnosis a tool to plan, organize, direct, execute, control and evaluate the activities of educational institutions, within the framework of the RIEB.

MEB5181 PLANNING EDUCATIONAL ORGANIZATIONS IN BASIC EDUCATION

At the end of the course, the student will be able to promote processes of change and improvement in and from schools through a comprehensive approach of the planning of educational organizations, within the framework of the educational reform of basic education.

MEB5191 SCHOOL ORGANIZATION IN BASIC EDUCATION

At the end of the course, the student will be able to develop the understanding of organizational processes in the school, with a reflective and critical vision of theory, practice and research, in the field of organizational theory applied to basic education.

MEB5211 MANAGEMENT OF BASIC EDUCATION INSTITUTIONS

At the end of the course, the student will be able to develop competencies that allow him to recognize the educational direction as the science that plans, organizes, directs, executes, controls and evaluates the activities of the educational institutions.

MEB5221 STRATEGIC EDUCATIONAL MANAGEMENT IN BASIC EDUCATION

Strengthen the knowledge and tools of strategic educational management so that basic education professionals intervene in educational institutions, through the Institutional Development Plan

MASTER IN SECONDARY EDUCATION

MEB5011 EDUCATIONAL TECHNOLOGY

At the end of the course, the student will be able to use applications that have an easy handling of information and communication, as well as develop multimedia educational materials to achieve meaningful learning.

MEB5021 TEACHER LEARNING ANALYSIS

At the end of the course, the student will be able to recognize and enhance their learning process as an adult and thereby appropriate the necessary tools to transform their teaching practice, applying appropriate techniques, using the support of educational software. You will also properly handle conflicts and make assertive decisions.

MEB5131 EDUCATIONAL LEGISLATION

At the end of the course, the student will be able to analyze, distinguish and explain the various laws and constitutional regulations that have a direct impact on education, as well as the various regulations on education, to maintain the legal trajectory of education, acquiring a clear vision of the current educational model.

MEB5031 EDUCATIONAL PROJECT DESIGN

At the end of the course, the student will be able to design, implement and evaluate effective work projects, considering the contextual factors that influence the learning of human beings in order to achieve better rates of educational achievement.

MEB5041 PROFESSIONAL DEVELOPMENT AND RESPONSIBILITY IN EDUCATIONAL PRACTICE

At the end of the course, the student will be able to apply various didactic strategies that favor professional development within the classroom and within a framework of professional responsibility for teaching the delivery of education, as well as reflect on the moral requirement of educational practice and the intervention of judgments and personal values, with the intention of achieving professional identification in a quality educational service.

EMPHASIS ON TEACHING PEDAGOGICAL SKILLS

MMS5091 INCLUSIVE SECONDARY EDUCATION AND DIVERSITY IN THE CLASSROOM

At the end of the course, the student will be able to develop the understanding of educational processes, with a reflective and critical vision of theory, practice and research, in the field of attention to diversity and inclusive education.

MMS5101 SECONDARY EDUCATIONAL THEORIES

At the end of the course, the student will be able to identify and analyze the object, methods and auxiliary sciences of education, in order to deepen the knowledge of the main theoretical foundations, identifying their main exponents, characteristics and approaches.

MMS5111 SECONDARY EDUCATION EVALUATION

At the end of the course, the student will be able to achieve the conceptualization of the educational evaluation under different perspectives, from their own experience and the analysis of the context.

MMS5121 CLASSROOM LEARNING IN SECONDARY EDUCATION

At the end of the course, the student will be able to analyze the processes of psycho-social development of students in the main stages of their development and reflect on the historical, socioeconomic and cultural factors that influence human learning, as well as the main theories that explain it.

MMS5151 TEACHER COMPETENCIES IN SECONDARY EDUCATION

The basic education professional, through the study of the competency-based approach, will apply in the classroom a pedagogy that builds knowledge, know-how, know-how to be and know-how to coexist, to promote the improvement of the main learnings of their students.

EMPHASIS ON MANAGEMENT OF EDUCATIONAL INSTITUTIONS

MMS5161 SECONDARY EDUCATION INSTITUTIONAL DIAGNOSIS

At the end of the course, the student will be able to develop competencies that allow him to recognize in the institutional diagnosis a tool to plan, organize, direct, execute, control and evaluate the activities of educational institutions, within the framework of the RIEB.

MMS5171 EDUCATIONAL ORGANIZATIONS PLANNING IN SECONDARY EDUCATION

At the end of the course, the student will be able to promote processes of change and improvement in and from schools through a comprehensive approach to the planning of educational organizations, within the framework of the educational reform in Higher Secondary Education.

MMS5181 SECONDARY EDUCATION SCHOOL ORGANIZATION

At the end of the course, the student will be able to develop the understanding of organizational processes in the school, with a reflective and critical vision of theory, practice and research, in the field of organizational theory applied to upper secondary education.

MMS5201 MANAGEMENT OF SECONDARY EDUCATION INSTITUTIONS

At the end of the course, the student will be able to develop competencies that allow him to recognize the educational direction as the science that plans, organizes, directs, executes, controls and evaluates the activities of the educational institutions.

MMS5211 STRATEGIC EDUCATIONAL MANAGEMENT IN SECONDARY EDUCATION

Strengthen the knowledge and tools of strategic educational management so that professionals of higher secondary education intervene in educational institutions, through the Institutional Development Plan.

PHD IN FOOD SCIENCE

DCL5011 TOPICS IN FOOD CHEMISTRY

Apply the fundamental aspects and basic concepts of food chemistry, to solve the problems faced in the conservation, processing, packaging, transport and storage of food products, through the analysis of situations and the review of the literature. Describe the chemical and functional properties of foods by analyzing the properties of their main components, to establish the relationship between the characteristics and behavior of food and its composition.

DCL5021 FOOD SAFETY

Generate solutions to prevent microbial proliferation in food, through the application of principles related to the nature and behavior of microorganisms, to produce safe and stable food products. Implement procedures to ensure the microbial safety of food, through the application of the Hazard analysis and Critical Control Points (HACCP) system.

DCL5031 ANALYTICAL RESEARCH METHODS IN FOOD SCIENCE

Decide which is the most convenient method to quantify the content of a certain component of a food or determine a certain property of it, based on the fundamentals of the different analytical methods available, in order to obtain reliable results. Analyze the data and interpret the results obtained in the determination of the properties and content of the components of the food, applying the principles on which the analytical methods used are based, in order to obtain informed conclusions about the characteristics of the food and the effects of the application of certain conditions and treatments to them.

DCL5041 FOOD SAFETY LAB

Evaluate the microbial content of different types of food, using the techniques proposed by official bodies, to determine their level of safety and/or the effect of the application of certain conditions or treatments on their safety and stability. Analyze the results obtained by applying the techniques of evaluation of the microbial content of food, through the use of equations and models of Microbiology, to generate reliable conclusions about the safety and stability of food.

DCL5051 RESEARCH ANALYSIS PRACTICES

Analyze foods by determining the concentration of their components and the value of their properties, using the analytical methods established by official bodies, in order to characterize the food and determine the effect of the application of various treatments on its composition and nature. Use the data obtained in the application of food analysis methods, to generate results that allow the characterization of food and the evaluation of the degree to which the conditions to which they are subjected affect them, through equations developed from the principles on which these methods are based.

DCL5061 PHYSICAL PROPERTIES OF FOOD

Apply the physical properties of food to design and develop products, equipment and processes of interest to the food industry, using mathematical tools of theoretical or empirical origin related to these properties. Evaluate the quality of food by determining its physical properties, to obtain information that contributes to the solution of the problems faced when preserving, processing, packaging, transporting and storing food products.

DCL5071 TOPICS IN FOOD PHYSICAL CHEMISTRY

Infer the effect of water activity and the vitreous transition of a specific food product, on the proliferation of microorganisms and the development of chemical reactions responsible for deterioration in it, as well as on its physical and physicochemical properties, applying the foundations of these thermodynamic concepts, in order to develop safe, attractive and stable food products. Solve the problems faced during the development, processing, packaging, transportation and storage of food products consisting of emulsions, foams, gels, suns and/or crystals, using the physicochemical principles that govern these systems, to ensure the quality, stability and safety of the products offered to consumers.

DCL5081 DATA ANALYSIS AND INTERPRETATION OF RESEARCH RESULTS IN FOOD SCIENCE

Generate experiments to test hypotheses raised about the effects that certain conditions or treatments have on the characteristics and properties of food, as well as on the factors responsible for its deterioration, using statistical methods of experimental design, in order to obtain valid and objective conclusions. Analyze the results of experimentation, applying statistical methods of data analysis, associated with experimental designs, in order to reach solid conclusions and add objectivity to decision-making.

PTA5011 PROFESSIONAL RESPONSIBILITY SEMINAR

At the end of the subject the student will be able to approach the solution of problems with freedom and transparency from a responsible and integral moral and ethical perspective so that in this way he can face the different challenges imposed by his professional activity, through the development of a research report. Design materials and products of professional activity taking into account their characteristics and the audience to whom it is addressed, through the writing of essays and a research report.

DCL5131 KNOWLEDGE EXAM

Solve the problems that arise during the processing, conservation, packaging, transportation and storage of food, using the theoretical and practical concepts analyzed in the different courses of disciplinary training level, in order to generate safe, nutritious, pleasant and stable food products. Develop research projects, applying the theoretical and practical concepts analyzed in the different courses of disciplinary training level, with the aim of solving the challenges faced by food science.

DCL5171 THESIS I

Generate the project of a research in food science, applying the steps of the scientific research process, in order to establish the bases for systematic, empirical and critical research. Effectively transmit the information corresponding to a research project in food science, through a complete, clear, concrete, coherent and consistent protocol, and the oral presentation of the same, for the consideration of other experts in the field.

DCL5141 PREDOCTORAL EXAMINATION

Generate conclusions of the research, from the interpretation and appropriate, complete, clear and deep discussion of the results obtained, using the theoretical foundations and observations reported by other researchers on the subject in question, in order to make contributions to knowledge or to the solution of problems related to food science. Transmit the results and conclusions of a research in food science, through a complete, clear, concrete, coherent and consistent report, presented orally and in writing, to disseminate them and submit them for the consideration of other experts in the field.

DCL5181 THESIS II

Implement the work plan of a scientific research, following the rules and recommendations to work in the Laboratory with efficiency and safety, in order to obtain reliable results and be free of dangers, damages or risks. Develop research in food science, applying the steps of the scientific research process, to generate new knowledge or solve problems in a systematic, empirical and critical way. Generate scientific information with the purpose of providing new knowledge or solving problems related to food science, following the recommendations for efficient work with the data and results obtained in the research. Effectively transmit information on the implementation of the work plan of an investigation and on the results obtained in it, through a complete, clear, concrete, coherent, consistent and attractive oral presentation, and a relevant, deep and informed argumentation, to submit this information for the consideration of other experts in the field.

DCL6041 RESEARCH SEMINAR I

Select sources of scientific information, relevant, important and recent, on a given topic of food science, using modern tools for the search and efficient organization of information, in order to have sufficient documents to make a comprehensive, in-depth and up-to-date literature review on the subject in question. Develop the theoretical framework of a scientific research, in order to put into context the problem being attempted to solve, using relevant, important and recent sources of scientific information, as well as strategies for the synthesis of the knowledge and data collected.

DCL6091 THESIS III

Generate a project in food science, with doctoral thesis level, applying the steps of the scientific research process, in order to establish the objectives, hypotheses and design of the research. Effectively transmit the information corresponding to a research project in food science, with the level of doctoral thesis, through a protocol and an oral presentation in which it is argued in a relevant and substantiated way about the objectives, the hypothesis and the design of the proposed research, to submit it to the consideration of other experts in the field.

DCL6051 RESEARCH SEMINAR II

Develop posters on research in food science, using modern tools and strategies of the production of this type of scientific documents, in order to make such research available and considered by other researchers. Effectively transmit the justification, objectives, work plan, methodology, results and conclusions of a research, through the presentation of a poster at a scientific congress, arguing in a relevant, deep and substantiated way, with the purpose of disseminating the results of the research and submitting them to the consideration of other experts in the field.

DCL6101 THESIS IV

Prepare review articles related to food science, with the purpose of examining, synthesizing and publishing substantial, specialized and current information on the chosen topic, using the strategies and tools of the production and publication of scientific documents. Implement the initial stage of a research project, selecting the relevant methodology and appropriate equipment, to obtain accurate, accurate and comparable results. Effectively transmit the information generated in the initial stage of the research project, through an oral presentation in which it is argued in a relevant and substantiated way about the methodology and the teams selected to carry out the research, in order to submit it to the consideration of other experts in the field.

DCL6061 RESEARCH SEMINAR III

Generate the preliminary report of a research in food science, with doctoral level, in a complete, clear, concrete, coherent and consistent way, and using pertinent, deep and substantiated arguments, in order to submit the research to the review of experts in the field. Efficiently transmit the information contained in the preliminary report of a research in food science, with doctoral level, through an oral presentation, to submit the research to the review of experts in the field.

DCL6111 THESIS V

Develop research articles related to food science, using the strategies and tools of the production of scientific documents, with the purpose of disseminating the results of the research and submitting them to the consideration of other experts in the field. Implement the second stage of a research project, selecting the appropriate tools and methods for the collection, processing and storage of data, in order to obtain reliable results. Effectively transmit the information generated in the second stage of the research project, through an oral presentation in which it is argued, in a relevant and substantiated way, on the tools and methods selected to collect, process and store the data and on the results obtained, in order to submit it to the consideration of other experts in the field.

DCL6071 RESEARCH SEMINAR IV

Prepare presentations on research in food science, using modern tools and strategies for the production of this type of scientific documents, in order to make such research available and considered by other researchers. Effectively transmit the justification, objectives, work plan, methodology, results and conclusions of a research, through its oral presentation at a scientific congress, arguing in a relevant, deep and substantiated way, in order to disseminate the results of the research and submit them to the consideration of other experts in the field.

DCL6121 THESIS VI

Manage the submission of scientific articles to journals with international arbitration, so that they are considered for publication in them, following the procedures specified by those responsible for the edition. Implement the third stage of a research project, processing the data and analyzing the results from all possible points of view and through the use of statistical tools, in order to make valid comparisons and obtain solid and objective conclusions. Effectively transmit the information generated in the third stage of the research project, through the oral presentation of the analysis of the results obtained, arguing with relevance, depth and substantiation, in order to submit it to the consideration of other experts in the field.

DCL6081 RESEARCH SEMINAR V

Generate effective proposals, to obtain funding from national or international organizations, to carry out research that leads to the solution of a problem or to the contribution of new knowledge of a certain area of food science, using modern tools and own strategies for the elaboration of this type of documents.

DCL6131 THESIS VII

Implement the final stage of a research project, generating valid and objective conclusions, based on the analysis and discussion of the results obtained, in order to provide new knowledge or solve problems related to food science. Effectively transmit the information generated when developing the research project (objectives, hypotheses, design, methodology, results and conclusions of the research), through a document and an oral presentation, using relevant, deep and substantiated arguments, with the purpose of making it available to other researchers in food science.

DCL5191 FERMENTED FOOD

Develop fermented food products from different types of food, applying the fundamentals of fermentation processes, to obtain novel and attractive products for consumers. Solve the problems faced during the preparation, packaging, transportation and storage of fermented food products, using the fundamentals of fermentation, to ensure the safety, quality and stability of the products offered to consumers.

DCL5201 SENSORY FOOD ASSESSMENT

Sensorially evaluate the food, applying the tests and methodology of the sensory discipline with scientific rigor, in order to characterize them and determine the effect of the application of various conditions and treatments on their appearance, flavor, color, aroma and texture. Analyze the results obtained in the sensory tests, applying statistical methods, in order to reach objective and valid conclusions.

DCL5211 SELECT TOPICS IN FOOD SCIENCE

Choose the right packaging, for the protection and preservation of a specific food product, through the application of packaging fundamentals and packaging materials. Estimate the shelf life of a specific food product, using the mathematical methods available for this purpose, in order to establish the maximum time that said product will maintain the quality required to be offered to consumers. To take responsibility for developing, formulating, processing and storing foodstuffs, in accordance with the legislation concerning them, in order to maintain an honest attitude towards consumers.

DCL5221 FOOD TECHNOLOGY TOPICS

Solve the problems faced during the preparation, packaging, transportation and storage of products obtained from foods of animal and vegetable origin (meats, dairy and marine products; fruits, vegetables and cereals), using the fundamentals and advances in knowledge concerning these foods, to ensure the safety, quality and stability of the products offered to consumers. Develop food products derived from foods of animal and vegetable origin (meats, dairy and marine products; fruits, vegetables and cereals), applying the fundamentals and advances in knowledge related to these foods, to obtain novel and attractive products for consumers.

DCL6141 CURRENT TRENDS IN FOOD SCIENCE

Generate new food products and solutions for food preservation, to respond to the recent needs and demands of consumers and producers, applying the concepts and foundations related to current trends in food science. Design and develop research projects, based on concepts and foundations related to cutting-edge trends in food science, to bring new information to this field of knowledge.

DCL6151 FOOD PROCESSING TOPICS

Solve the problems that arise when processing, packaging, transporting and storing food products, applying the fundamentals and advances of traditional preservation and processing methods (refrigeration, freezing, additives, dehydration, heat treatment), to ensure the safety, quality and stability of the products offered to consumers. Develop new food products, using the fundamentals and advances of traditional preservation and processing methods (refrigeration, freezing, additives, dehydration, heat treatment), to meet the demands and needs of today's consumers.

DCL6161 SELECT TOPICS I

Solve the problems faced during the processing, packaging, transportation and storage of food, in order to ensure the safety, quality and stability of the products offered to consumers, applying the fundamentals and concepts of Select Topics in Food Science. Design and develop research projects, to generate new food products and solutions for food preservation, which respond to the current needs and demands of consumers and producers, using the concepts and foundations of Selected Topics in Food Science.

DCL6171 PREDICTIVE MICROBIOLOGY

Solve the microbiological problems that arise when developing and preserving food products, using the tools of predictive microbiology, to ensure the safety, safety and stability of the products offered to consumers. Design and develop research projects, applying the theoretical and practical concepts of predictive microbiology to food science, to provide new information to this field of knowledge.

DCL6181 FOOD POWDER TECHNOLOGY

To solve the problems faced in relation to solid particles of a food nature, when processing, packaging, transporting and storing food products, applying the concepts and principles concerning these particles, to ensure the quality and stability of the products offered to consumers. Design and develop research projects, to generate new food products and solutions for food preservation, which respond to the current needs and demands of consumers and producers, using the concepts and foundations related to solid particles of a food nature.

DCL6191 SELECT TOPICS II

Generate new food products and solutions for food preservation, to respond to the recent needs and demands of consumers and producers, through research projects related to Selected Topics in Food Science. Solving problems arise when processing, preserving, packaging, transporting and storing food, with the purpose of offering consumers safe, nutritious, pleasant and stable products, applying the fundamentals and concepts of Select Topics in Food Science.

DCL6201 MICROBIOLOGY TOPICS

Create novel food products and alternative solutions for food preservation, in order to respond to the needs and demands that consumers and producers have today, using concepts and principles related to specific and cutting-edge topics in Food Microbiology. Generate and direct research applying the concepts and foundations of specific and cutting-edge topics in Food Microbiology, to bring new knowledge to this area of science.

DCL6211 EMERGING TECHNOLOGIES

Generate and direct research, applying the concepts and foundations of emerging technologies for food processing, with the purpose of providing new information to this field of knowledge. Innovate in the processing and conservation of food, through the use of emerging technologies, in order to generate products and solutions that respond to the demands that consumers and producers currently have.

DCL6221 SELECT TOPICS III

Solve the problems that arise during the preparation, packaging, transportation and storage of food products, using the principles and concepts of Selected Topics in Food Science, to offer consumers safe, nutritious, pleasant and stable products. Create innovative food products and alternative solutions for food preservation, through the development of research projects related to Selected Topics in Food Science, to respond to what consumers and producers of today demand.

PHD IN WATER SCIENCES

DCG5011 PHYSICAL CHEMICAL PRINCIPLES

Analyze the techniques and tools necessary for the proper selection of a treatment train based on the characteristics of the water to treat and design all its units to integrate a water treatment plant.

DCG5021 BIOLOGICAL PRINCIPLES

Identify the role of biological processes in natural water purification systems. Analyze the changes in these processes that favor the accumulation of pollutants in the different aquatic systems. Identify indicators of biological systems in the planet's environment.

DCG5031 RIVER HYDRAULICS

Analyze and interpret the fundamental principles of flow in natural channels, which allow the evaluation and determination of the physical processes of the dynamics of rivers. Operate the necessary principles of fluid mechanics for flow treatment in natural channels.

DCG5041 SURFACE AND UNDERGROUND HYDROLOGY

Solve problems related to the occurrence of precipitation, infiltration and evapotranspiration. Apply the different unit hydrographs that are required to analyze the relationship rain - runoff. Use the concepts and techniques necessary for the solution of problems related to the flow of groundwater.

DCG5051 ENVIRONMENTAL IMPACT ASSESSMENT

Recognize the environmental factors that determine the level of water, air and soil pollution. Use technology for the proper control of pollutants in water, air and soil. Identify, evaluate and solve Environmental Impact problems related to environmental projects.

DCG5061 CONVENTIONAL WATER TREATMENT

Analyze the basic principles of conventional water treatment, considering the process of coagulation, flocculation and sedimentation that allow the removal of conventional contaminants from the water. Apply the knowledge acquired for the design of basic units.

DCG507 1 PHYSICAL HYDROLOGY

Analyze the theoretical concepts to carry out a water balance in hydrological basins associated with the supply and demand of water resources for different uses. Describe the different atmospheric phenomena and the variables that govern them. Describe and apply the different equations that govern hydrological phenomena under different conditions.

DCG5081 ENVIRONMENTAL HYDRAULICS

Recognize the fundamental principles of open channel flow. Apply the fundamental principles of mixing and dispersing processes in natural channels. Apply the fundamental principles of diffusion processes in natural channels.

DCG5091 SELECT TOPICS

Identify elements necessary for the proper selection of a selected topic that allows to deepen the knowledge of the water sciences. Identify the strategies necessary to propose a comprehensive solution to a specific problem in the water sector.

PTA5011 PROFESSIONAL RESPONSIBILITY SEMINAR

At the end of the subject the student will be able to approach the solution of problems with freedom and transparency from a responsible and integral moral and ethical perspective so that in this way he can face the different challenges imposed by his professional activity, through the development of a research report. Design materials and products of professional activity taking into account their characteristics and the audience to whom it is addressed, through the writing of essays and a research report.

DCG5101 KNOWLEDGE EXAM

Analyze the elements necessary for the theoretical-practical evaluation of the knowledge acquired during the formative Academic stage. Identify and analyze various scientific articles that support proposals for solutions to the problems associated with the water sector.

DCG5141 THESIS I

Analyze the different types of research protocols. Develop skills to elaborate a research protocol associated with the solution of a national problem in the water sector. Identify the rules included in at least two models that should be considered for the development of a research protocol.

DCG5111 PREDOCTORAL EXAM

Analyze the most appropriate strategies to link theoretical and practical knowledge with the problems identified in the doctoral research line. Develop a holistic analysis in the approach of solutions associated with a problem in the water sector. Provide the necessary elements for an adequate defense of the doctoral research project.

DCG5151 THESIS II

Identify and analyze the different types of research and the elements that should be included in a state of the art doctoral thesis. Explain the requirements that a doctoral thesis must meet according to a line of research in the water sector. Explain the minimum elements required for the preparation of a scientific article.

DCG6041 RESEARCH SEMINAR I

Identify a project that defines the line of research so that at the end of the course there is bibliographical research related to the topic of interest. Make the formal proposal of the research protocol for approval by the academic core of the doctorate in water sciences.

DCG6091 THESIS III

Identify the indexed journals according to the chosen doctoral research line, as well as know the procedure to carry out a search for previous work in the specialty. Show the elements that make up a doctoral research project and review those included in the particular line of research.

DCG6051 RESEARCH SEMINAR II

To analyze the fundamental principles and factors of the experimental and observational method in the field of research. Describe the basic principles that govern the different types of experimental designs and their block techniques.

DCG6101 THESIS IV

Develop the proposed doctoral research project that allows to obtain the doctoral degree, making use of the research facilities available in the program.

DCG6061 RESEARCH SEMINAR III

Design the most appropriate research strategies that should be reflected in the advancement of doctoral research. Identify and select the appropriate strategy for the follow-up to the project and the line of research in the subject of the doctoral thesis.

DCG6111 THESIS V

Develop and demonstrate the originally proposed progress of the doctoral research project that allows the obtaining of the academic degree making use of the research facilities available in the program.

DCG6071 RESEARCH SEMINAR IV

Identify and select the appropriate strategy for the follow-up of the project and doctoral research line. Review and suggest improvements to the proposal integrated in the research protocol, and evaluate its progress for the approval of the academic core of the doctorate in water sciences.

DCG6121 THESIS VI

Identify the essential elements for the preparation and submission of a research article in arbitrary journals, as well as the mechanism and conditions for its submission. Analyze the rules governing copyright and how to reference the works consulted during the doctoral research work. Organize and integrate the necessary elements for the doctoral thesis work.

DCG6081 RESEARCH SEMINAR V

Analyze the concept of ethics applied in the water sector. Identify the regulations and rules that govern water regulation, with a focus on water ethics and the human right to water.

DCG6131 THESIS VII

Analyze the overall information of the doctoral research project. Organize and integrate with a holistic vision the doctoral thesis work and obtain the proposed academic degree.

ADVANCED ELECTIVES

DCG6141 PATHOGENS AND WATER QUALITY

Identify the relationships between pathogens and water quality, by studying the main microorganisms present in water capable of causing hydro-transmitted diseases and their effect on human health. Analyze the different conventional and unconventional treatments for water disinfection.

DCG6151 DYNAMIC ENVIRONMENTAL SYSTEMS

Analyze the approach of systemic and holistic thinking that considers the environmental problems of water management and its interaction with social and economic spheres. Model and simulate through the dynamics of systems, the interaction of environmental and socioeconomic contexts in order to determine the consequences of policies and strategies on water management. Internalize research mechanisms – action to consider the diverse perspectives of stakeholders in water management.

DCG6161 SELECT TOPICS I

Analyze and apply the necessary elements to identify a priority issue in the water sector, associated with a recurring problem. Analyze the different strategies to identify and analyze research articles on priority issues of the water sector.

DCG6171 ENVIRONMENTAL CHEMICAL KINETICS

Analyze the elements necessary for the study of chemical kinetics in aquatic and treatment systems. Analyze the theoretical framework and equations that govern the phenomenon of chemical kinetics associated with the environment.

DCG6181 PROBABILITY AND STATISTICS IN WATER RESOURCES

Analyze the necessary elements of Probability and Statistics for the integral management of water resources, as well as associate this knowledge with the hydrological cycle and water resource management models.

DCG6191 SELECT TOPICS II

Analyze the elements necessary to identify a priority issue in the water sector, associated with a recurring problem and the interaction between the quantity and quality of the water. Identify the different strategies to select and analyze research articles on priority topics in the water sector.

DCG6201 ADVANCED WATER TREATMENT

Analyze advanced water treatment processes for the removal of unconventional contaminants from water sources for human use and consumption, industry and re-use. Apply the knowledge acquired for the design of treatment units.

DCG6211 HYDROLOGICAL MODELING

Solve problems related to the occurrence of precipitation and how its respective runoff is affected by the different conditions favored by human activity. Identify and apply different tools for the integral management of water, incorporating the climate change component.

DCG6221 SELECT TOPICS III

Identify the basic and fundamental principles to analyze a priority issue in the water sector, associated with a recurring problem and interaction with the modeling of water quantity and quality. Analyze the different strategies to identify research articles on priority issues of the water sector associated with the modeling of water quality and quantity.

PHD IN CREATION AND CULTURE THEORY

DCC6012 CRITICAL HISTORY OF CREATIVE WORK

Develop a historical tour from the nineteenth century to the present day by following the most outstanding models of creative work, through the mastery of critical tools, for its comparative analysis on the fundamental changes in the practice of work and the current conditions of its development.

DCC6022 RESEARCH METHODOLOGY

Analyze the characteristic elements of different methodologies used in research projects, in order to generate an advance of the research approach of different processes and problems of contemporary culture, through the review of the main methodological currents.

DCC6032 CULTURAL CREATION AND SOCIAL INVOLVEMENT

Design a research-creation project by setting in motion Creative practices that are linked to a selected social community, to identify the results of how the sharp separation between creator and public is dissolved.

DCC6042 CONTEMPORARY CULTURAL INSTITUTIONS

Analyze the most outstanding public and private, commercial and non-commercial strategies of cultural management and self-management, such as coworking or media lab, and the most representative institutions related to culture and its consumption, to develop reflective written texts on these fields of study, through the identification of concrete case studies.

DCC6062 THESIS I

Identify the research topic and problem, according to its relevance and viability, by delimiting the assumptions to start the doctoral thesis project.

DCC6072 THESIS II

Analyze the background of the topic of the research project, by identifying the state of the art and the argumentative research needed in order to raise the process of fieldwork and the research problem.

DCC6082 RESEARCH SEMINAR I

Explain the advances and results obtained in your thesis project from the bibliographic review, through the elaboration of an academic article, to disseminate the results of the research.

DCC6092 THESIS III

Apply different methodologies according to the research criteria of the literature that is based on the particular project that is being developed in the area of Creation and Theories of Culture in order to contrast and analyze the results.

DCC6102 RESEARCH SEMINAR II

Effectively transmit the information generated in the initial stage of the research project, through the preparation of an academic research article that is argued in a relevant and substantiated way about the methodology selected to carry out the research, in order to submit it to the consideration of other experts in the field.

DCC6112 THESIS IV

Argue the development of the thesis project in the areas of creation and theories of culture, through the design of measuring instruments, as well as observation to justify the product of research.

DCC6122 RESEARCH SEMINAR III

Explain the results obtained during the research in the areas of creation and theories of culture, through argumentative research and theoretical support, in order to present them at a conference or congress.

DCC6132 THESIS V

Define the final structure of the student's doctoral thesis applied in creation and theories of culture, by evaluating all its parts and methodological processes to elaborate the introduction and conclusion of said thesis. Expose the development of the doctoral thesis, through the use of argumentative and syntactic methodologies to defend the thesis work.

DCC6142 RESEARCH SEMINAR IV

Conclude the research and processing of the thesis in Creation and Theories of Culture, by substantiating the updated bibliography to define the introduction and the conclusions or recommendations thereof. Expose the final product of research in the area of Creation and Theories of Culture, by pointing out its methodology used to defend its doctoral thesis.

ELECTIVES

DCC6152 TECHNOLOGY AND KNOWLEDGE PRODUCTION

Evaluate the conditions of knowledge production, through the development of qualitative research that studies the relationship between these conditions and the local, national and international environment, through the identification of the role of technology as enhancing or limiting intellectual work, in order to develop exercises and critical writings reflective on these problems.

DCC6162 CRITICISM, CULTURE AND POLITICS

Critically assess cultural phenomena, through fieldwork and other observations of political processes, the articulation of power networks and contemporary socio-economic contexts, to propose thoughtful written studies and oral interventions of broad spectrum.

DCC6172 BODY POLICIES

It applies contemporary theories of the corporeality of body policies and exposes its theoretically argued conclusions, through a critical analysis of the role of the body in history and in modern and postmodern thought, in order to prepare reports and essays that serve as proposals related to the research of the thesis.

DCC6182 WAYS TO DO: CREATION AND PERFORMATIVITY

Develop research works related to the debate and the presence of creativity and performativity in contemporary art and culture, through a written reflection and an oral intervention, to carry out field studies.

DCC6192 GLOBALIZATION AND SOCIAL PROCESSES

Describe the processes that are immersed in social globalization, through the analysis of concepts and themes of globalization and social processes to settle the strategies of study and research in this field.

DCC6202 EXCESSIVE MODERNITIES

Identify the characteristics of modernity and postmodernity in contemporary art and culture from the most relevant authors to carry out studies in the sociocultural environment, through written reflection and oral intervention of a broad spectrum.

PHD IN INTELLIGENT SYSTEMS

DSI5011 DYNAMICAL SYSTEM MODELING

Identify how the inputs to systems affect the outputs, or identify which inputs must be provided to generate a desired output, through models with Ordinary Differential Equations, which satisfy certain conditions of linearity and invariance in time. Analyze real dynamic phenomena and dynamical systems through the study of the properties of the mathematical representations of such dynamical systems, and

learn to translate concrete situations into appropriate mathematical representations to answer questions that arise in real situations.

DSI5021 ARTIFICIAL INTELLIGENCE

Analyze the field of Artificial Intelligence and the study of principles and techniques in three central areas: problem solving, knowledge representation and machine learning through the fundamentals for the study of more advanced Artificial Intelligence.

DSI5031 MULTIMEDIA SIGNAL PROCESSING

Analyze the fundamental principles and techniques of multimedia Signal Processing and compression, current standards and technologies, and describe future technologies. Solve problems related to multimedia Signal Processing, through projects. Assess the impact and implications of technologies related to Multimedia Signal Processing in different contexts to delimit the scope and limitations of projects in the area.

DSI5041 OPTIMIZATION TECHNIQUES

Identify optimization theory as a design principle through theory, examples and tasks to solve problems from simple applications to industrial problems. Design and analyze convex optimization algorithms using concepts and principles that are easy to visualize and understand in order to achieve the algorithmic and analytical core of continuous optimization and horseback point theory. Act responsibly during the formulation of engineering problems through mathematical optimization formulations.

DSI5051 ARTIFICIAL VISION

Analyze the theory and mathematical techniques of digital image processing and computer vision, by exposing technology and software used in image analysis and manipulation. Apply methodologies in the area of artificial vision and techniques of digitization, standardization and modification of images using the basic mathematical operators, as well as the techniques and methods of segmentation, improvement, restoration, recovery, interpretation and recognition of visual information in areas such as medicine, biology, robotics, public safety, computer human interaction, distance education to solve computer vision problems. Assess the impact of solving problems in today's world by applying digital image processing and pro-computer vision techniques.

DSI5061 PATTERN RECOGNITION

Identify the most used techniques for Pattern Recognition tasks by presenting different methods, so that critical choices are made of the techniques to be used when facing real applications in the areas of Image analysis, audio and speech recognition, Data Mining, data recovery and bio-computing.

DSI5071 SOFT COMPUTING

Identify concepts and techniques of soft computation and potentiate skills in the design and implementation of solutions to real problems based on soft computation. Choose and apply methodologies of systems inspired by natural intelligence, also characterized by the use of inaccurate and/or approximate solutions, through theoretical analysis and the use of software, to solve tasks of high computational complexity, where there is not enough information about the problem. Show empathy, responsibility and ethics during the design of systems to be used for the solution of real problems through principles, concepts and techniques based on soft computation.

PTA5011 PROFESSIONAL RESPONSIBILITY SEMINAR

It identifies the main characteristics of the design, elaboration and communication of the materials and products of its professional activity taking into account the type of material and the audience to whom it is addressed. It approaches the solution of problems with freedom and transparency from a responsible and integral moral and ethical perspective so that in this way it can face the different challenges imposed by its professional activity. The student designs, elaborates and communicates materials and products of his professional activity taking into account the type of material and the audience he is addressing. The students are fully aware of the responsibility involved in the exercise of their Profession from a moral and ethical perspective. He reflects on the professional activity and the society in which he is immersed with dignity, freedom and respect, strengthening his humanist vision and professional vocation.

ISD5121 KNOWLEDGE EXAM

Master the theoretical and practical knowledge acquired in the different courses of the non-elective disciplinary training level, as well as in the most recent scientific production associated with each course. Master the work to prepare a dissertation by handling information and appropriate methodologies in the field of knowledge. Recognize the importance and impact of independently conducting original and relevant research.

DSI5161 THESIS I

Plan a dissertation through concentrating on the generation of an appropriate topic for research with the prospect of finishing it in a second period. Design and apply the process related to the process of scientific research in computing. At the end, the student will have elaborated and presented his formal proposal, with an investigation of the theoretical framework and a conceptual analysis of the subject that he carries out as a predoctoral research project. Act with ethics, integrity during the preparation of a research proposal.

DSI5131 PREDOCTORAL EXAMINATION

Validate a postgraduate student's ability to conduct research independently and evaluate the viability of the student's proposal as a doctoral dissertation. Master the formulation and description of a specific research topic, which is manifested in a written proposal and oral presentations, through the analysis of relevant literature and the use of research methodologies. Recognize the importance and impact of independently conducting original and relevant research.

DSI5171 THESIS II

Deeply analyze the area and line of research with the purpose of investigating problems independently, resulting in a contribution to the area of knowledge and a research-based thesis. Develop the predoctoral research project under the supervision of an advisor. This work will be possible through the integration of various computational techniques, software engineering, as well as the detailed investigation of an area of knowledge, so that in the end the student develops skills as a researcher and generates research results. Demonstrate a conduct and understanding of professional ethics as applied to the program through its performance during the development of a research project.

DSI6041 RESEARCH SEMINAR I

Identify the methodologies for selection of research articles in the area of interest by collecting recent literature and related to the particular line of interest to identify the background to a research project, as well as to suggest proposals for research papers. Evaluate and assess research articles, as well as the procedures for the preparation, elaboration and publication of an article through review of bibliography in the area of interest and discussions with faculty and students. In this way, the process of training a

researcher is initiated. Recognize the previous work of researchers in the area of interest by valuing their contributions and identifying trajectories to continue with these works, contributing and reinforcing previous knowledge.

DSI6091 THESIS III

Identify the general outline of the research methodology, through the mentor's guide and sessions with the research group to which the student belongs, for the elaboration of a research project and the corresponding thesis document. Develop a solid and comprehensive research plan following the rubric and doctoral proposal guidelines to meet the standards and scrutiny of the evaluation committee, professors and colleagues. Act with autonomy and rectitude during the preparation of a doctoral research proposal, following ethical and conviction codes.

DSI6051 RESEARCH SEMINAR II

Identify and apply the methodology for the approach of a hypothesis that gives rise to a research project through participation in projects to start a process of knowledge generation. Develop techniques of critical thinking, research, writing and documentation by opening up to problem-solving strategies, formal questioning and the research of other academics. As part of the development of the final deliverable, consisting of a detailed project proposal with the approach of hypotheses and methodologies, a series of questions will be created that are of vital importance to the researcher. Produce contributions within an area of knowledge through a behavior based on ethical principles to positively impact a technological area, discipline of knowledge and society.

DSI6101 THESIS IV

Identify the concept, the process and the impact of the approach of a hypothesis in the execution of a project by evaluating it to identify its strengths and weaknesses in order to continue on the same hypothesis, or discard it. Develop a hypothesis in the solution of scientific problems through the guidance and interaction of the thesis mentor for the execution of a research project that is innovative. Contribute to social development through research and education and in qualified professional capacity.

DSI6061 RESEARCH SEMINAR III

Develop techniques of critical thinking, research, writing and documentation by opening up to problem-solving strategies, formal questioning and the research of other academics. As part of the development of the final deliverable, it will consist of a detailed project proposal with the approach of hypotheses and methodologies, a series of questions will be created that are of vital importance to the researcher. Develop comparative analyses on different research projects that solve the same problem by identifying and collecting the most recent and innovative works to determine the line of research to follow and the elaboration of different hypotheses. Appreciate and value research works that will be the starting point for personal research.

DSI6111 THESIS V

Analyze and recognize essential facts, concepts, principles and theories related to the topic "scientific methodology" in order to be able to be an apprentice researcher. Apply the scientific method in the realization of a research project by interacting with the thesis advisor to demonstrate innovation and contributions of scientific work. Act responsibly and ethically during the conduct of the scientific method for the integral and legitimate completion of research projects and works.

DSI6071 RESEARCH SEMINAR IV

Analyze tools, such as researchers' social networks and/or platforms for evaluating articles, for interaction and collaboration with other researchers. Integrate and participate in research networks through the use of platforms, technology and protocols to enrich experiences when it comes to criticizing and/or assimilating the research of other academic peers. Show interest and commitment when generating and acquiring knowledge through interaction with colleagues, teachers and students to enrich the experiences of the team.

DSI6121 THESIS VI

Identify dynamics and tools for teamwork and interaction with other colleagues during the execution of research projects, through participation in research social networks and in idea sessions with colleagues and the thesis mentor, with the goal of achieving research results that are of common interest. Collaborate directly or indirectly in groups for the execution of research activities through the application of various techniques that ensure the integrity of the scientific methodology by team. Act with commitment, dedication and tolerance during teamwork to enrich the research experiences of all team members and to generate promising results, planning organized together, work meetings and assignment of tasks.

DSI6081 RESEARCH SEMINAR V

Identify different examples of development of research project protocols, identifying different sections, structure and styles. Plan, develop and execute executive proposals for research and technological development projects through a perspective oriented to seek financial efficiency and emerging technological trends and new lines of research with the purpose of developing research with a high scientific, technological and socio-economic impact. Act with integrity and sensitivity during the development of research project protocols, understanding the implications of the development of such a project.

DSI6131 THESIS VII

Broadly recognize concepts, principles, and theories related to advanced topics of intelligent systems to be considered an authority on intelligent systems. Show interest in the culmination of a research project through interaction with the thesis advisor, colleagues and academic peers to generate an innovative scientific product as well as scientific and technological impact. Demonstrate ethics, responsibility and commitment to conduct independent research by advancing knowledge in the area through doctoral research.

BASIC ELECTIVES

DSI5181 HEURISTIC COMPUTER METHODS

Analyze how heuristic and search algorithms are implemented efficiently to obtain optimal solutions in discrete optimization problems. These algorithms are useful for finding approximations in problems of the "NP-hard" type, for which exact solution methods are not known.

DSI5191 AUGMENTED REALITY

Recognize and define the concept of human-computer interaction for eventual analysis of its applications in different engineering problems through discussions and presentations by the teacher and students. Design programs for human-computer interaction with methods based on user interfaces in three dimensions for applications in various fields such as visualization and video games and their respective implementation in personal computers or smartphones.

DSI5201 INTELLIGENT ENERGY SYSTEMS

Identify the basic principles for the generation, distribution and transmission of energy in towns and cities through the integration of intelligent systems and power generation systems. Design systems for real-time data processing to monitor and optimize the generation, transmission and distribution of electrical energy in buildings through the use of technology based on energy sustainability. Assess the need for the generation of renewable and/or clean energy as well as the efficient use of it to achieve technological and energetical sustainability through the use and application of Artificial Intelligence in the operation and the functioning of energy generation and use systems.

DSI5211 STATISTICAL LEARNING METHODS

Identify the operating principles of a learning machine, based on probability functions for the eventual design and implementation of statistical learning algorithms. Develop learning algorithms and analyze their performance and statistical properties by handling convex optimization and techniques for handling very large data sets. The algorithms to be designed will be applied to solve scientific and technological problems such as detection of anomalies in medical images or recognition of human activities in videos. Contemplate the implications that are generated from the application of statistical learning machines in contexts such as biomedicine, communications, etc. and be sensitive to the needs and problems of such contexts.

DSI6141 DATA MINING

Identify the fundamental concepts inherent in Data Mining through the implementation of algorithms commonly used in Data Mining tools for their eventual application to real problems. Apply methods from statistics and Artificial Intelligence that are of value in pattern recognition for decision making from an application perspective through the search for opportunities to experiment with software and cases for Data Mining. Assess the impact of the concepts, principles and theory of Data Mining in the solution of real problems through experiments and real contexts where there is viability of applying tools based on Data Mining.

DSI6151 BIO-INSPIRED HARDWARE

Identify the concepts, principles and theory related to algorithms that can be used for the autonomous design and adaptation of intelligent systems. Design and simulate systems inspired by natural intelligence by using programmable logic and Hardware Description Languages (VHDL) to achieve the combination of technologies related to bio-inspired systems and digital technology based on reconfigurable systems (FPGA) and digital signal processors. Show conviction about the applications, uses and impact of biologically inspired systems through the application of learning methods used for search, optimization and classification.

DSI6161 SELECT TOPICS I

Identify the fundamental concepts, and applications of information processing techniques and digital signals in multimedia and communications systems. Develop previous skills and knowledge to explore technological and research topics that are novel and of recent interest in scientific communities, particularly in the area of Multimedia Signal Processing, with a critical and interdisciplinary point of view to generate new knowledge, skills, research opportunities and contributions. The objectives and contents will be based on the interests of the students and the lines of research of the program. Assess the impact and implications of information processing and multimedia signals in applications in different contexts such as equalizers, noise filtering, signal compression in videoconferencing, radar and sonar applications.

DSI6171 AGENTS AND MULTI-AGENT SYSTEMS

Identify advanced topics in the investigation of multi-agent systems for application in solving real problems through the use of logic and algorithm design. Develop research to design and implement multi-agent systems applied in real situations. Assess the implications and impacts of the application of technology based on multi-agent systems through the exploration of problems in real contexts.

DSI6181 EVOLUTIONARY ROBOTICS

Identify and analyze the concepts, principles and theory of robotic systems through action and planning in robot design. To investigate the theory and existing methods for the design of autonomous machines based on the design and implementation of evolutionary algorithms for the creation of robots with evolution in the body, brain and behavior. To assess the importance and relevance of how cognitive sciences, control theory, and mechatronic systems help in the design and implementation of more efficient robotic systems as well as the importance of biology in learning to design robots.

ISD6191 SELECT TOPICS II

Interpret the principles of bio-inspired computer systems to use bio-inspired techniques in the design and implementation phase of a computational device through understanding the relationship between computer systems and natural processes. Apply previous skills and knowledge to explore technological and research topics that are novel and of recent interest in scientific communities, particularly in the area of bio-inspired systems, with a critical and interdisciplinary point of view to generate new knowledge, skills, research opportunities and contributions. The objectives and contents will be based on the interests of the students and the lines of research of the program. Assess the impact and implications of the use of computational processes, inspired by natural intelligence, in applications in different contexts such as genetic algorithms, recognition, classification, detection, prediction.

DSI6201 AMBIENT INTELLIGENCE

Identify the vision and the most recent advances of pervasive, wearable and ubiquitous computation, and their role in the construction of intelligent environments, by observing and analyzing the fact that people are surrounded by everyday objects that respond according to the presence and behavior of each user for the design of technology that provides intelligence to the everyday environment (automobiles , global positioning system (GPS) applications, refrigerators, smart homes, etc.) as well as making it sensitive to people. Design software-hardware architectures and apply the necessary technology in the conception and realization of intelligent environments at various levels of architecture (sensors, home automation, sensor networks, information analysis, user interfaces), through the use of design methodologies. Recognize the importance and impact of ambient intelligence, emphasizing its multidisciplinary nature and application areas and technologies, the evolution of the consumption of electronic technology, sensor networks and the ability to represent and process information on a large scale to enable the design of intelligent environments that efficiently operate variables of energy, comfort, safety and interaction with users in a wide range of applications from homes to buildings smart cities, smart cities and smart transport systems.

ISD6211 COMMUNICATION NETWORKS

Develop the theoretical and practical knowledge of the technologies of interconnectivity of computer networks in addition to telecommunications protocols including mobile environments and security in information exchange, through the use of previous knowledge such as modulation theory, transmission of information, signals and systems; so that finally the student can manage, operate and maintain a wireless communications system. Design telecommunications systems and computer networks through the use of different protocols, technologies and communications architectures to improve efficiency in

connectivity and information exchange. Recognize the impact and implications related to the application, evolution and management of telecommunications technology and computer networks in different social, economic and environmental contexts.

DSI6221 SELECT TOPICS III

Analyze the research area of intelligent agents through reading and discussing a selection of research articles, as well as the implementation of a system with agent programming. Apply previous skills and knowledge to explore technological and research topics that are novel and of recent interest in scientific communities, particularly in the area of environments and intelligent agents, with a critical and interdisciplinary point of view to generate new knowledge, skills, research opportunities and contributions. The objectives and contents will be based on the interests of the students and the lines of research of the program. Assess the impact and implications of the use of computational processes, inspired by natural intelligence, in applications in different contexts such as genetic algorithms, recognition, classification, detection, prediction.

2016

EDUCATIONAL OFFER

UNIVERSIDAD DE LAS AMÉRICAS PUEBLA

LICENCIATURA IN DENTAL SURGEON

LMR1032 ANATOMIC PHYSIOLOGY

Evaluate the fundamentals of the morphology and normal functioning of the organism, by analyzing the structure and normal function of the different systems to obtain a broad view on the physical configuration of the human being.

LMR1022 CLINICAL BIOCHEMISTRY

Identify the structure of biomolecules by observing their development in the lab to establish their relationship with the human body. Review the processes involved in the molecular mechanisms and chemical transformations responsible for the biological processes involved in the functions of the organism, by simulating them to arrive at better diagnoses in professional practice.

LMR1042 EMBRYOLOGY AND GENETICS

Outline the origin, growth and development of human beings and the cause of the processes that intervene in normal ontogeny, to carry out a preventive work and promotion of adequate health habits, understanding the morphological changes that occur in different developmental stages.

ESP0011 SPANISH I (*)

At the end of the course, the student can manage information to write texts within the discipline, adapting the necessary writing to achieve persuasive intention in the context of the academic interactions of the area.

LMR1012 HISTOLOGY

Describe the microscopic structures of the cells, tissues and organs of different devices and systems of the human body, identifying and classifying cells to relate them to diseases' pathophysiology.

LEX0111 FOREIGN LANGUAGE I *

At the end of the course, the student can transmit and understand known and/or new information orally and in writing.

LCD1011 DENTAL ANATOMY

Use concepts and different types of teething to develop wax models, which resemble a real intervention in patients, through the identification of the stomatognathic apparatus and its elements.

LMR1062 CELLULAR AND MOLECULAR BIOLOGY

Understand the structure, organization, compartmentalization, molecular and cellular complexity necessary to describe the vital phenomena both in single-celled organisms and in the integration of organisms, using scientific reasoning and a critical attitude that correlates the knowledge of cellular and molecular biology with a diagnosis and adequate treatments to understand the cellular regulation and gene expression processes.

ESP0021 SPANISH II (*)

At the end of the course, the student is able to select and manage information to guide their exposition and reasoning skills to write texts of their discipline, managing them as expressions for the construction and dissemination of academic and scientific knowledge.

LMR1052 PHYSIOLOGY

Understand the basic knowledge of medical physiology and the fundamentals of the normal functioning of the organism; through the analysis of the alterations that occur in the disease, by using scientific reasoning with a critical attitude to correlate the knowledge of physiology with an adequate diagnosis and treatment.

LEX0121 FOREIGN LANGUAGE II *

At the end of the course, the student can transmit and understand known and/or new information orally and in writing.

MAT0011 QUANTITATIVE REASONING (*)

At the end of the course, the student can pose and solve problems, translate statements into symbolic relationships, efficiently manage symbols, use graphs and symbols to communicate quantitative data and interpret graphs.

INF0011 INFORMATION TECHNOLOGIES IN THE CONSTRUCTION OF KNOWLEDGE *

At the end of the course, the student is able to use Information and Communication Technologies in the processes of research, decision-making, generation of ideas and proposals; combining its processing capabilities to access, validate, share and use information effectively and ethically.

LCD2041 DENTAL ANESTHESIOLOGY

Select dental anesthesiology techniques, by analyzing the characteristics and types of anesthetics to perform optimal analgesics to be able to work with patients.

LMR2022 GENERAL PHARMACOLOGY

Interpret the knowledge acquired about general pharmacology, action mechanisms, indications and contraindications of the different drugs to develop skills to rationally prescribe medicines.

LCD2021 DENTAL MATERIALS LAB

Explain the structures and physicochemical properties of different dental materials, through the analysis of the components and praxis that will help to perfect various techniques, to properly manipulate the materials during dental practice.

LEX0131 FOREIGN LANGUAGE III *

At the end of the course, the student can transmit and understand known and/or new information orally and in writing.

LMR2012 MICROBIOLOGY AND PARASITOLOGY

Identify the biological bases of microorganisms that cause the infectious diseases that prevail in our environment, considering mainly structural, biochemical and genetic properties involved in the process

of infectious diseases. Use suitable samples to isolate and identify microorganisms based on different types of microscopic, biochemical or immunological tests.

LCD2011 PREVENTIVE AND COMMUNITY DENTISTRY

Identify the different prevention mechanisms by analyzing different dental care techniques to develop preventive oral education programs.

LCD2061 ORAL PATHOLOGY

Understand the alterations and diseases located in the oral cavity, maxillary, mandibular and dental organs, by studying the causes and development of signs and symptoms, as well as multidisciplinary participation, to determine the diagnosis and timely detection of serious diseases.

LMR2032 PROPAEDEUTICS IN HEALTH SCIENCES

Analyze the propaedeutic methodology based on the syndromes of the different pathologies, applying the theoretical foundations of the propaedeutic method, to move towards an etiological, syndromic, anatomopathological and integral diagnosis. Develop skills and abilities necessary to explore the nervous system, through the analysis of the principles of effective communication, transmission, interpretation, expression and comprehension of oral and written language to make complete medical records (inspection, palpation, percussion and auscultation).

AHC0011 ART, HISTORY AND CULTURE (*)

At the end of the course, the student is able to identify and analyze communication and action strategies, as well as the influence of political, social and economic change on the transformation of models, conceptualization of cultural artifact and its conservation.

LCD2051 DENTAL OPERATION CLINIC

Apply procedures in the dental operation, through the description of elements, dental structures and injuries, which allow an analysis of the process to be followed and return function and aesthetics to the dental organ.

MAT2001 STATISTICS

Manage the basic concepts of math notation used in the descriptive data analysis, through the identification of the statistical relationship with the scientific method to apply the descriptive statistical methods in the analysis of social issues.

LCD2071 DENTAL IMAGING

Use the different techniques of intraoral and extraoral x-rays, by analyzing the methodology and processing of dental imaging to develop interpretations of the radiographic study.

LMR2062 CLINICAL IMMUNOLOGY

Describe the pharmacological basis of current therapeutics by using pharmacology-specific terminology to identify the effects of drugs. Discuss the current pharmacology challenges in the discovery of new drugs through the knowledge of their behavior in the body and the circumstances that modify the response to their treatment to propose new methods to optimize pharmacotherapies.

LMR2042 NUTRITION AND METABOLISM

Determine the importance of food as a supplier of nutrients, study the way in which they are assimilated by the human body, understanding both the physiological and metabolic function, as well as the different states of health and disease, to integrate actions of prevention, diagnosis and treatment of nutritional disorders.

LCD2031 OCCLUSION

Analyze the types of pathologies of the temporomandibular joint, by thoroughly detecting the different stages of eruption of the teeth and acquiring masticatory skills, to apply the ideal comprehensive treatment.

LMR3012 BIOETHICS IN HEALTH SCIENCES

Debate professional development based on codes and ethical principles, through the justification of legal regulations, laws, individual guarantees, human rights and cultural diversities, to assess the limitations and opportunities that favor a sustainable multidisciplinary comprehensive approach.

LCD3051 DENTAL OPERATION CLINIC II

Carry out relevant reconstructions in the dental organ, through the description of the procedures and techniques for the management of tissues, respecting aesthetics and function.

LCD3061 ENDODONTICS

Identify the physiology, anatomy and pathologies of the pulp chamber of the dental organ and periradicular tissues, through diagnosis to propose treatments that help the preservation of natural dental organs.

EDS0011 ETHICS FOR SUSTAINABLE DEVELOPMENT (*)

At the end of the course, the student can identify and analyze the general guidelines to study sustainable development, both theoretically and practically; the relevance of ethical behavior in the design and implementation of sustainable development; Mexico's shortcomings and progress in terms of sustainable development; policies conducive to carrying out significant socially responsible changes in terms of sustainable development.

LCD3041 DENTAL EXTRACTION

Describe dental extraction procedures, through the analysis of surgical principles and clinical behavior to apply the necessary actions and treatment to follow.

LCD3031 PERIODONTICS

Identify periodontal conditions in a structured way, through the analysis of the medical history and pathologies of the oral cavity to develop diagnoses and prevention treatments that address these diseases.

LCD3021 PROSTHESIS

Explain the procedures to be performed on the fixed prosthesis, by assessing the prosthetic steps to perform the reconstruction of the dental organ.

LCD3121 ENDODONTICS CLINIC

Identify the physiology, anatomy and pathologies of the pulp chamber, dental organ and periradicular tissues, through endodontic treatment to obtain results in the preservation of natural dental organs.

LCD3101 EXODONTIC CLINIC

Perform extractions and oral surgical procedures, through the application of exodontic techniques and appropriate instruments to determine the avulsion or extraction of the tooth or root rest.

LCD3081 PERIODONTICS CLINIC

Apply advanced procedures and techniques in reconstructive treatment, through the analysis of periodontal disease to adapt regenerative and aesthetic treatment plans. Detect factors that influence the development of periodontal disease, by identifying bad habits, bad dental procedures and diseases to propose a complete oral health.

LCD3111 PROTHESIS CLINIC

Understand the procedures and foundations of the fixed and removable prosthesis, through the analysis of the physiological, mechanical and aesthetic principles of the oral cavity to develop skills in an orderly and sequential way.

LCD3091 PROSTHODONTICS

Develop prosthodontic techniques and procedures, through the elaboration of complete dentures and the proper use of the various materials and equipment for the study and practice of prosthodontics achieving a rehabilitation in the function and aesthetics of the oral cavity.

LMR3022 PUBLIC HEALTH AND EPIDEMIOLOGY IN HEALTH SCIENCES

Identify the importance of epidemiology by applying the epidemiological variables of time, place and person to study the population health situation. Evaluate the health indicators of communities and populations by identifying health problems to design programs that comply with a public health policy.

LCD3071 SELECT TOPICS I

Assess morphological changes, in terms of shape, color, surface, intra-bone and perioral lesions of the oral cavity, maxillofacial region, head and neck, by analyzing histopathological, microbiological or cabinet studies to determine common oral pathologies.

LCD4041 MAXILLOFACIAL SURGERY

Use the techniques and procedures in maxillofacial surgery, by identifying the different pathologies and lesions in the oral cavity to generate a reconstructive, regenerative and aesthetic treatment in maxillofacial surgery. Describe the procedures that allow to proceed safely in the field of surgery, through the analysis of surgical principles, to determine the necessary actions to be used in the treatment.

LCD4021 PROSTHODONTIC CLINIC

Develop techniques and procedures to make complete and monomandibular dentures; optimally using various dental materials and equipment for the practice of total prosthodontics.

LCD4031 PEDIATRIC DENTISTRY

Detect the type of behavior of the pediatric patient by analyzing the psychological, cognitive and emotional development of the child and adolescent, to generate adequate pediatric rehabilitation procedures.

LCD4061 ORTHODONTICS

To determine the changes presented within the dental organs such as the maxillary region, head, neck, by analyzing the occlusions to formulate diagnoses and treatments in orthodontics.

LMR4012 HEALTH PSYCHOLOGY

Select the procedures and techniques that best suit different situations, assessing the health aspect from an interdisciplinary way, reviewing biological, social and psychological aspects, to determine the factors that affect the mental pathology of the patient. Analyze personality disorders and other diseases, by classifying each of them and knowing the main traits, to develop medical practice.

LCD4051 ORAL REHABILITATION

Apply necessary techniques and procedures, through the evaluation of oral diseases and their psychological aspects to generate oral rehabilitation treatments.

LCD4011 SELECT TOPICS II

Use dentistry as a method to identify people, through the analysis of teeth, materials and x-rays, as well as the realization of medical records that provide pre- and postmortem information, to collate data, look for coincidences or differences in dental structures.

LCD4091 MAXILLOFACIAL SURGERY CLINIC

Apply techniques and procedures in maxillofacial surgery, through the analysis of the latest procedures and advanced techniques in reconstructive, regenerative and aesthetic treatment in this type of surgery to achieve a treatment and rehabilitation focused on the patient.

LCD4121 PEDIATRIC DENTISTRY CLINIC

Apply advanced techniques and procedures in pediatric dentistry treatments, through the clinical analysis of the behavior of the pediatric patient to implement a comprehensive rehabilitation.

LCD4071 GERIATRIC REHABILITATION CLINIC

Describe the physical-organic characteristics of the stomatognathic apparatus with edentation problems and its relationship with the elderly, as well as the factors involved in its etiology to structure a complete rehabilitation in the elderly.

LCD4101 ORAL REHABILITATION CLINIC

Use oral rehabilitation techniques and procedures, through the analysis of diagnosis, treatment and rehabilitation to generate a recovery in the patient.

LCD4111 ORTHODONTIC LAB

Analyze the orthodontic treatment following the ordered procedures, by identifying habits and malocclusions in the patient, to describe the generalities when applying devices in the oral cavity.

LMR4022 HEALTH SCIENCES RESEARCH METHODOLOGY

Develop a theoretical and/or experimental work, under the direction and advice of a professional of any of the areas or topics of the specialty, by evaluating the methodology to design a research protocol.

LCD4081 SELECT TOPICS III

Use new techniques and procedures in surgical updates, through the assessment of reconstructive, regenerative and aesthetic treatments to create novel treatments.

GENERAL ART ELECTIVE

ART0022 ART AND CULTURE OF THE AMERICAS

Identify sociocultural development in the Americas through their artistic expressions to establish an active dialogue with this past and its identity context.

ART0012 ART, HISTORY AND CULTURE

Identify how human beings define reality and express it for themselves and the world from the emergence of Western modernity, by explaining the reciprocal relationship between art, history and culture to critically argue artistic representation and expression topics.

GENERAL MATH ELECTIVE

MAT0012 MATH FOR THINKING

Apply various approaches to mathematical thinking by modeling and analyzing hypothetical and real-world phenomena, to design solutions to problems related to your studies and your physical environment.

MAT0022 MATH AND CULTURE

Develop a project that integrates math with any of the expressions of culture, by modeling phenomena or indicators to make decisions that benefit society.

GENERAL BEHAVIORAL SCIENCE ELECTIVE

COM0012 ETHICS, SOCIETY AND THE ENVIRONMENT
Discuss global problems and their local implications by integrating socio-economic, environmental and ethical aspects to create proposals for a tolerant society.

COM0022 BEHAVIOR AND HUMAN DEVELOPMENT
Identify human development's bio-psycho-social factors, by analyzing the variables that affect individual and social behavior and use this knowledge in their academic and professional life.

GENERAL NATURAL SCIENCE ELECTIVE

CNE0012 FOOD AND LIFE
Identify the relationship between food and health through research that provides data on eating habits to choose an informed diet for your daily life.

CNE0022 EVOLUTION AND BIODIVERSITY
Describe the origin of diseases through causal factors to assess human health information sources.

GENERAL HUMANITIES ELECTIVE

HUM0012 ECOSOPHY
Compare world representation systems, analyzing different epistemological proposals to reposition the current Being-Man relationship with their environment and other beings from a fundamentally ecological philosophical dimension.

HUM0022 HUMANISTIC THINKING
Study humanist thought from a socio-historical cultural perspective, based on the analysis of its different historical nuances to understand its relevance in contemporary culture.

PHD IN MOLECULAR BIOMEDICINE

DBM5011 DESIGN OF EXPERIMENTS AND BIOSTATISTICS
At the end of the subject the student will be able to select the most appropriate statistical analysis method for a specific problem of the biomedical or clinical area applying the principles of the design of experiments for the validation of experimental tests that lead to reliable and significant results of the biomedical or clinical area. Detect problems related to the statistical analysis of data of experimental or clinical origin to infer from the data obtained during the experiments significant and valid results in problems in the biomedical or clinical area.

DBM5021 MOLECULAR AND CELLULAR BIOLOGY

At the end of the subject the student will be able to discuss and argue about the synthesis and distribution of proteins, tissue differentiation and gene expression by understanding the pathological processes at the cellular level for application in research projects. Analyze information on cellular and subcellular organization, their functions and regulation to develop research projects in the area by describing the mechanisms, processes and stages of molecular and cellular biology. Explain division and communication under normal and pathological conditions through a current, critical and interdisciplinary point of view for the generation of projects.

DBM5031 EXPERIMENTAL ANALYTICAL METHODS

At the end of the subject the student will be able to solve problems related to the separation, purification and characterization in general (composition, purity, structure, size, morphology, among other properties) of samples of biological, pharmaceutical, biochemical or biomedical interest, using the experimental methods corresponding to each characterization for the development of experimental projects. Apply different methods for the identification of natural and synthetic materials by analyzing their physical, chemical and spectroscopic data. Interpret and explain in writing the fundamental concepts of experimental analytical methods through the analysis and interpretation of information to carry out projects.

DBM5041 PHARMACOLOGY AND TOXICOLOGY

At the end of the subject the student will be able to propose strategies in the design and rational use of drugs, evaluating the toxicity of natural and synthetic chemicals for the solution of clinical cases.

DBM5051 PATHOPHYSIOLOGY

At the end of the subject the student will be able to interpret the specific mechanisms of the pathological processes of organs and systems to determine the causes and main pathophysiological consequences involved in the production of diseases, and apply this knowledge in the interpretation of clinical manifestations. Apply knowledge of biology, chemistry, physiology and biochemistry to innovate in research projects on pathophysiology through collaborative work in the groups where it participates.

DBM5061 DRUG DESIGN

At the end of the subject the student will be able to apply chemical and computational tools to design drugs through the selection of the best parameters and strategies. Recognize the molecular fragments that constitute a leading compound, through the application of chemical and computational tools developed in the design of drugs to provide solutions to real cases. Implement strategies to solve problems of molecular biomedicine using the techniques and tools of science, to carry out projects in the design of drugs.

DBM5071 EXPERIMENTAL BIOLOGICAL AND MOLECULAR METHODS

At the end of the subject the student will be able to interpret the fundamental concepts of the experimental biological and molecular methods, through their review, for the elaboration of reports of experiments. Select the best method for the detection, separation, purification and characterization of biomolecules of biological, pharmaceutical, biochemical or biomedical interest through the development of research projects, for the execution of laboratory experiments.

PTA5011 PROFESSIONAL RESPONSIBILITY SEMINAR

At the end of the subject the student will be able to approach the solution of problems with freedom and transparency from a responsible and integral moral and ethical perspective so that in this way he can face the different challenges imposed by his professional activity, through the development of a research report. Design materials and products of professional activity taking into account their characteristics and the audience to whom it is addressed, through the writing of essays and a research report.

DBM5121 KNOWLEDGE EXAM

At the end of the subject the student will be able to design strategies to solve the problems that arise during the collection, analysis and interpretation of data obtained in the experimentation in biomedicine, integrating the theoretical-practical knowledge acquired for the resolution of problems of the discipline, through the presentation of the pre-doctoral research project.

DBM5161 THESIS I

At the end of the subject the student will be able to design original proposals for interdisciplinary research protocols in the area of biological health sciences and chemistry, applied to biomedical problems, through the application of the elements of the scientific research process, so that they contribute to the generation of scientific knowledge in their area and that they are based on ethical principles. Systematically analyze the information in areas of molecular biomedicine, using different databases as well as printed and electronic journals, for the development of projects or solutions. Interpret information regarding the research topic, through a detailed and in-depth analysis of the protocol, for the exposition of the experimental design. Compare knowledge of the research topic, through the implementation of technological alternatives in the development of biomedical products, for the diagnosis and treatment of pathologies through systematic methodologies of the discipline. Combine different methodologies, through the analysis and selection of their most relevant characteristics, for the resolution of biomedical problems.

DBM5221 BIOETHICS

At the end of the subject the student will be able to analyze the different clinical cases and phenomena of study of molecular biomedicine, through the application of the codes or principles of bioethics to argue and discuss with a secular, critical and professional sense.

DBM5131 PREDOCTORAL EXAM

At the end of the subject the student will be able to debate and sustain the information used and obtained in their pre-doctoral research project through a detailed, critical and deep analysis of the experimental design, in the oral presentation with the aim of solving the challenges faced by the area. Support solutions or paths to solve biomedical problems through the use of appropriate methodologies to support and defend your pre-doctoral research project.

DBM5171 THESIS II

At the end of the subject the student will be able to defend original proposals for interdisciplinary research in the area of health sciences and biological chemistry, through its application to biomedical problems, in written and oral form, to contribute to the generation of original scientific knowledge in their area and that are based on the highest ethical principles. Systematically analyze information in areas of molecular biomedicine, through the use of different sources of information, for the development of projects or solutions. Adapt information through a detailed and in-depth analysis, through a detailed literature review, for the design of your project experiments. Combine different methodologies, through the selection of their most relevant characteristics, for the analysis and resolution of the problem posed in

the research. Propose the theoretical framework of a chosen research topic, based on the bibliographic search that supports your research proposal, for the elaboration of a research project. Support and prepare a written work of pre-doctoral thesis, through its research project, to present it in writing and orally to the evaluation committee.

DBM6091 THESIS III

At the end of the subject the student will be able to analyze quality results of the processes of the first stage of the research, using different tools such as the use of standardized scales, quantitative and/or qualitative observation, and statistical tests, to generate a continuous improvement and guarantee effectiveness and reproducibility of the results. Master the technologies of the Profession, through the necessary laboratory techniques and equipment, for biomedical research. Develop practical skills in the manipulation of laboratory techniques and equipment, applying the foundation and manuals of the instruments in detail, to carry out research. Systematically analyze the information in areas of molecular biomedicine, using the printed and electronic media of the area, for the development of projects or solutions. Prepare technical reports, through the use of technological tools, to report the processes and research results of the first stage.

DBM6041 RESEARCH SEMINAR I

At the end of the subject the student will be able to investigate, develop and present relevant information obtained from a bibliographic search, based on the research methodology, to propose the theoretical framework of the research project and present it in different ways.

DBM6101 THESIS IV

At the end of the subject the student will be able to analyze quality results of the processes of the second stage of the research, using different tools such as the use of standardized scales, quantitative and/or qualitative observation, as well as statistical tests, to generate a continuous improvement and guarantee effectiveness and reproducibility of the results. Master the technologies of the Profession, through the necessary laboratory techniques and equipment, for biomedical research. Systematically analyze the information in areas of molecular biomedicine, using the printed and electronic media of the area, for the development of projects and solutions. Prepare technical reports, through the use of technological tools, to report the processes and research results of the second stage.

DBM6051 RESEARCH SEMINAR II

At the end of the subject the student will be able to communicate in an understandable, simple, informative, precise, complete and specific way, the approach of the research problem, through the presentation of a poster, to show the substantiation and the progress of the results. Argue in a critical, analytical and advanced way the research problem to be solved and the most important advances of the research, through its exposition, in order to transmit the results of the research and submit them to the analysis of an academic committee.

DBM6111 THESIS V

Analyze and efficiently and effectively integrate the results of their research, through the writing of articles in specialized scientific journals and international dissemination, to inform the generation of new knowledge in the area. Formulate new knowledge, carrying out original research, to increase the frontiers of knowledge in any of the areas of molecular biomedicine.

DBM6061 RESEARCH SEMINAR III

At the end of the subject the student will be able to collect, analyze, synthesize and discuss the information published on a topic, by writing a review article, to make a critical examination of the state of knowledge reported in the literature. Support a research topic and present it, through the structure of a review article, for publication in an indexed journal.

DBM6121 THESIS VI

At the end of the subject the student will master the technologies, techniques and laboratory equipment of the Profession, through the development of practical skills in the manipulation of equipment and application of techniques, to carry out biomedical research. Systematically analyze the information in areas of molecular biomedicine, interpreting detailed and deep information for the experimental design of projects. Analyze quality results of experimentation processes, selecting the relevant information of your experimentation, to generate continuous improvement and ensure effectiveness and reproducibility of the results. Develop and conduct research projects, making use of the methodologies appropriate to the type of problem, for the resolution of biomedical problems.

DBM6071 RESEARCH SEMINAR IV

At the end of the subject the student will be able to explain and present the information of the results obtained in his research project, through the analysis and interpretation of quantitative and qualitative information, in an oral and written way, to describe in the report the research. Communicate in a critical, analytical and advanced way the results and conclusions of your research, through an oral presentation and a written document, in order to inform the new knowledge generated.

DBM6131 THESIS VII

At the end of the subject the student will be able to report in an orderly and concise way the most relevant results of their research, through a written document, to demonstrate that the objectives of the research were achieved. Discuss the meaning of the results of the work, by presenting data that supports the answer to the research question, to confirm the hypothesis of the research. Highlight the importance of the data that gives validity to the main idea of the research, orally and in writing, presenting critical, clear and concrete conclusions. Analyze results of the quality of the processes and capture them through a written document, to generate continuous improvement and guarantee the effectiveness and reproducibility of the results.

DBM6081 RESEARCH SEMINAR V

At the end of the subject the student will be able to present research proposals, through the implementation of modern tools and personal strategies in the elaboration of documents that participate by research funds before national or international organizations, that allow the generation knowledge of border and contribute to improve the quality of the higher education and to the training of scientists and academics.

BASIC ELECTIVES 1 AND 2

DBM5181 OBTAINING ACTIVE INGREDIENTS USING BIOTECHNOLOGY

At the end of the subject the student will be able to review and relate information on biotechnological processes applied to obtaining active ingredients to develop knowledge and/or skills in this area through the implementation of biotechnological methods. Discuss and argue the advantages of different methods and know examples that illustrate how a process is designed to obtain active ingredients through the

application of enzymes, microorganisms or tissue culture. Supporting the research topic selected to solve a problem in molecular biomedicine, through a current, critical and interdisciplinary point of view.

DBM5191 PHARMACEUTICAL BIOTECHNOLOGY

At the end of the subject the student will be able to apply knowledge of biology, chemistry, pharmacology, biotechnology, toxicology and economics to design new molecules, as well as improve existing ones in order to reduce side effects and decrease drug resistance. Identify and explain division and communication under normal and pathological conditions from a current, critical and interdisciplinary point of view in the development of projects. To be able to design and conduct experiments in the area of pharmaceutical biotechnology, through the analysis and interpretation of information, to communicate it later in an effective way. To be able to base the impact of biotechnology in global, economic, environmental and social contexts through the implementation of techniques and tools necessary for the practice of pharmaceutical biotechnology. Discuss and argue about protein synthesis and distribution, tissue differentiation and gene expression to understand pathological processes at the cellular level.

DBM5201 SELECT CLINICAL RESEARCH TOPICS

At the end of the subject the student will be able to detect needs and research opportunities to propose solutions to real problems in molecular biomedicine, through the review of the results of the most current research in the area. Apply the scientific and operational concepts and tools used in clinical research, to measure quality and clinical safety in the case study, through a research proposal. Address and synthesize the determinants of disease and its problems by integrating health determinants and providing health care services to conduct clinical research projects. Use the information and communication technologies of each clinical setting to apply them in complex biomedical systems when interacting with the care plan within the framework of integrated personalized medicine care programs.

DBM5211 CLINICAL STUDY DEVELOPMENT

At the end of the subject the student will be able to apply national and international professional standards in the design and conduct of clinical studies using the appropriate research terminology as well as the consideration of all the phases, tests and tools necessary for the successful fulfillment of a clinical study within the objectives of the sponsor, the research organization by contract , the clinical site and the participating subjects, all within the framework of good clinical practices.

ADVANCED ELECTIVES

DBM6141 MEDICAL SYSTEMS BIOLOGY

At the end of the subject the student will be able to design specific biomedical models from the identification of basic concepts of systems biology related to the study and treatment of problems for their resolution and treatment through a research project.

DBM6151 GENOMIC MEDICINE

At the end of the subject the student will be able to review and relate information about genetics and molecular biology tools applied to genomic medicine to carry out problem solving in the area from a current, critical and interdisciplinary point of view. Discuss and argue the applications of genomic medicine as an individualized, predictive and preventive medicine, attached to ethics and respect for the rights of patients, for the production of trials.

DBM6161 SELECT TOPICS I

At the end of the subject the student will be able to commit to the solution of problems faced during the obtaining of natural or synthetic products with medical applications and the development of biomedical diagnostic products, applying the foundations and concepts of Selected Topics in molecular biomedicine for application in research projects. Design research projects, for obtaining natural or synthetic products with medical applications and in the development of biomedical diagnostic products, using the concepts and foundations of Selected Topics in Molecular Biomedicine.

DBM6171 IDENTIFICATION OF BIOLOGICAL COMPOUNDS

At the end of the subject the student will be able to systematically and objectively use the spectroscopic data of different biological compounds, in order to propose consistent chemical structures, through the analysis and interpretation of information. Design and conduct experiments using techniques and tools needed in structural elucidation, to be reported in articles.

DBM6181 NANOMEDICINE

At the end of the subject the student will be able to solve problems related to the design, synthesis, characterization and use of advanced and/or nanostructured materials through the written argumentation of the fundamental concepts of the properties of the materials for the solution of biomedical problems. Select advanced and/or nanostructured material for health-related problems such as medical imaging, controlled drug transport and release, biomaterials, therapy and diagnosis through exercise and problem solving. Argue in writing the fundamental concepts of the properties of advanced and/or nanostructured materials useful for biomedical applications by developing essays.

DBM6191 SELECT TOPICS II

At the end of the subject the student will be able to generate new methodologies and/or materials with biomedical applications and solutions for the development and validation of therapeutics in molecular biomedicine, through research projects related to Selected Topics of the area for its application in the development of research projects. Solve the problems that arise in the development and validation of therapeutics, applying the foundations and concepts of Selected Topics in molecular biomedicine to offer alternatives in health matters to society.

DBM6201 CLINICAL RESEARCH

At the end of the subject the student will be able to design, analyze, evaluate, conduct and communicate the results of a clinical study through the knowledge and application of the main technical-scientific, ethical and regulatory requirements necessary to carry out clinical research.

DBM6211 MOLECULAR METHODS

At the end of the subject the student will be able to obtain information on molecular techniques, through the analysis of deoxyribonucleic acid (DNA) and ribonucleic acid (RNA), for application in the diagnosis of monogenic and complex diseases. Implement cytogenetic techniques, differentiating hybridization techniques, for the evaluation of chromosomopathies. Analyze molecular techniques, through a current, critical and interdisciplinary point of view, to solve problems in the use of molecular methods.

DBM6221 SELECT TOPICS III

At the end of the subject the student will be able to detect the problems that arise during the clinical research of natural and synthetic products with medical applications, using the principles and concepts of Selected Topics in molecular biomedicine, to offer solutions to current health problems. Obtain innovative synthetic compounds and alternative solutions for the clinical research of natural and synthetic products

with medical applications, through the development of research projects related to Selected Topics in molecular biomedicine, to respond to the needs in the area of health.

PHD IN FOOD SCIENCE

DCL5011 TOPICS IN FOOD CHEMISTRY

Apply the fundamental aspects and basic concepts of food chemistry, to solve the problems faced in the conservation, processing, packaging, transport and storage of food products, through the analysis of situations and the review of the literature. Describe the chemical and functional properties of foods by analyzing the properties of their main components, to establish the relationship between the characteristics and behavior of food and its composition.

DCL5021 FOOD SAFETY

Generate solutions to prevent microbial proliferation in food, through the application of principles related to the nature and behavior of microorganisms, to produce safe and stable food products. Implement procedures to ensure the microbial safety of food, through the application of the Hazard analysis and Critical Control Points (HACCP) system.

DCL5031 ANALYTICAL RESEARCH METHODS IN FOOD SCIENCE

Decide which is the most convenient method to quantify the content of a certain component of a food or determine a certain property of it, based on the fundamentals of the different analytical methods available, in order to obtain reliable results. Analyze the data and interpret the results obtained in the determination of the properties and content of the components of the food, applying the principles on which the analytical methods used are based, in order to obtain informed conclusions about the characteristics of the food and the effects of the application of certain conditions and treatments to them.

DCL5041 FOOD SAFETY LAB

Evaluate the microbial content of different types of food, using the techniques proposed by official bodies, to determine their level of safety and/or the effect of the application of certain conditions or treatments on their safety and stability. Analyze the results obtained by applying the techniques of evaluation of the microbial content of food, through the use of equations and models of Microbiology, to generate reliable conclusions about the safety and stability of food.

DCL5051 RESEARCH ANALYSIS PRACTICES

Analyze foods by determining the concentration of their components and the value of their properties, using the analytical methods established by official bodies, in order to characterize the food and determine the effect of the application of various treatments on its composition and nature. Use the data obtained in the application of food analysis methods, to generate results that allow the characterization of food and the evaluation of the degree to which the conditions to which they are subjected affect them, through equations developed from the principles on which these methods are based.

DCL5061 PHYSICAL PROPERTIES OF FOOD

Apply the physical properties of food to design and develop products, equipment and processes of interest to the food industry, using mathematical tools of theoretical or empirical origin related to these properties. Evaluate the quality of food by determining its physical properties, to obtain information that contributes to the solution of the problems faced when preserving, processing, packaging, transporting and storing food products.

DCL5071 TOPICS IN FOOD PHYSICAL CHEMISTRY

Infer the effect of water activity and the vitreous transition of a specific food product, on the proliferation of microorganisms and the development of chemical reactions responsible for deterioration in it, as well as on its physical and physicochemical properties, applying the foundations of these thermodynamic concepts, in order to develop safe, attractive and stable food products. Solve the problems faced during the development, processing, packaging, transportation and storage of food products consisting of emulsions, foams, gels, suns and/or crystals, using the physicochemical principles that govern these systems, to ensure the quality, stability and safety of the products offered to consumers.

DCL5081 DATA ANALYSIS AND INTERPRETATION OF RESEARCH RESULTS IN FOOD SCIENCE

Generate experiments to test hypotheses raised about the effects that certain conditions or treatments have on the characteristics and properties of food, as well as on the factors responsible for its deterioration, using statistical methods of experimental design, in order to obtain valid and objective conclusions. Analyze the results of experimentation, applying statistical methods of data analysis, associated with experimental designs, in order to reach solid conclusions and add objectivity to decision-making.

PTA5011 PROFESSIONAL RESPONSIBILITY SEMINAR

At the end of the subject the student will be able to approach the solution of problems with freedom and transparency from a responsible and integral moral and ethical perspective so that in this way he can face the different challenges imposed by his professional activity, through the development of a research report. Design materials and products of professional activity taking into account their characteristics and the audience to whom it is addressed, through the writing of essays and a research report.

DCL5131 KNOWLEDGE EXAM

Solve the problems that arise during the processing, conservation, packaging, transportation and storage of food, using the theoretical and practical concepts analyzed in the different courses of disciplinary training level, in order to generate safe, nutritious, pleasant and stable food products. Develop research projects, applying the theoretical and practical concepts analyzed in the different courses of disciplinary training level, with the aim of solving the challenges faced by food science.

DCL5171 THESIS I

Generate the project of a research in food science, applying the steps of the scientific research process, in order to establish the bases for systematic, empirical and critical research. Effectively transmit the information corresponding to a research project in food science, through a complete, clear, concrete, coherent and consistent protocol, and the oral presentation of the same, for the consideration of other experts in the field.

DCL5141 PREDOCTORAL EXAMINATION

Generate conclusions of the research, from the interpretation and appropriate, complete, clear and deep discussion of the results obtained, using the theoretical foundations and observations reported by other researchers on the subject in question, in order to make contributions to knowledge or to the solution of problems related to food science. Transmit the results and conclusions of a research in food science, through a complete, clear, concrete, coherent and consistent report, presented orally and in writing, to disseminate them and submit them for the consideration of other experts in the field.

DCL5181 THESIS II

Implement the work plan of a scientific research, following the rules and recommendations to work in the Laboratory with efficiency and safety, in order to obtain reliable results and be free of dangers, damages or risks. Develop research in food science, applying the steps of the scientific research process, to generate new knowledge or solve problems in a systematic, empirical and critical way. Generate scientific information with the purpose of providing new knowledge or solving problems related to food science, following the recommendations for efficient work with the data and results obtained in the research. Effectively transmit information on the implementation of the work plan of an investigation and on the results obtained in it, through a complete, clear, concrete, coherent, consistent and attractive oral presentation, and a relevant, deep and informed argumentation, to submit this information for the consideration of other experts in the field.

DCL6041 RESEARCH SEMINAR I

Select sources of scientific information, relevant, important and recent, on a given topic of food science, using modern tools for the search and efficient organization of information, in order to have sufficient documents to make a comprehensive, in-depth and up-to-date literature review on the subject in question. Develop the theoretical framework of a scientific research, in order to put into context the problem being attempted to solve, using relevant, important and recent sources of scientific information, as well as strategies for the synthesis of the knowledge and data collected.

DCL6091 THESIS III

Generate a project in food science, with doctoral thesis level, applying the steps of the scientific research process, in order to establish the objectives, hypotheses and design of the research. Effectively transmit the information corresponding to a research project in food science, with the level of doctoral thesis, through a protocol and an oral presentation in which it is argued in a relevant and substantiated way about the objectives, the hypothesis and the design of the proposed research, to submit it to the consideration of other experts in the field.

DCL6051 RESEARCH SEMINAR II

Develop posters on research in food science, using modern tools and strategies of the production of this type of scientific documents, in order to make such research available and considered by other researchers. Effectively transmit the justification, objectives, work plan, methodology, results and conclusions of a research, through the presentation of a poster at a scientific congress, arguing in a relevant, deep and substantiated way, with the purpose of disseminating the results of the research and submitting them to the consideration of other experts in the field.

DCL6101 THESIS IV

Prepare review articles related to food science, with the purpose of examining, synthesizing and publishing substantial, specialized and current information on the chosen topic, using the strategies and

tools of the production and publication of scientific documents. Implement the initial stage of a research project, selecting the relevant methodology and appropriate equipment, to obtain accurate, accurate and comparable results. Effectively transmit the information generated in the initial stage of the research project, through an oral presentation in which it is argued in a relevant and substantiated way about the methodology and the teams selected to carry out the research, in order to submit it to the consideration of other experts in the field.

DCL6061 RESEARCH SEMINAR III

Generate the preliminary report of a research in food science, with doctoral level, in a complete, clear, concrete, coherent and consistent way, and using pertinent, deep and substantiated arguments, in order to submit the research to the review of experts in the field. Efficiently transmit the information contained in the preliminary report of a research in food science, with doctoral level, through an oral presentation, to submit the research to the review of experts in the field.

DCL6111 THESIS V

Develop research articles related to food science, using the strategies and tools of the production of scientific documents, with the purpose of disseminating the results of the research and submitting them to the consideration of other experts in the field. Implement the second stage of a research project, selecting the appropriate tools and methods for the collection, processing and storage of data, in order to obtain reliable results. Effectively transmit the information generated in the second stage of the research project, through an oral presentation in which it is argued, in a relevant and substantiated way, on the tools and methods selected to collect, process and store the data and on the results obtained, in order to submit it to the consideration of other experts in the field.

DCL6071 RESEARCH SEMINAR IV

Prepare presentations on research in food science, using modern tools and strategies for the production of this type of scientific documents, in order to make such research available and considered by other researchers. Effectively transmit the justification, objectives, work plan, methodology, results and conclusions of a research, through its oral presentation at a scientific congress, arguing in a relevant, deep and substantiated way, in order to disseminate the results of the research and submit them to the consideration of other experts in the field.

DCL6121 THESIS VI

Manage the submission of scientific articles to journals with international arbitration, so that they are considered for publication in them, following the procedures specified by those responsible for the edition. Implement the third stage of a research project, processing the data and analyzing the results from all possible points of view and through the use of statistical tools, in order to make valid comparisons and obtain solid and objective conclusions. Effectively transmit the information generated in the third stage of the research project, through the oral presentation of the analysis of the results obtained, arguing with relevance, depth and substantiation, in order to submit it to the consideration of other experts in the field.

DCL6081 RESEARCH SEMINAR V

Generate effective proposals, to obtain funding from national or international organizations, to carry out research that leads to the solution of a problem or to the contribution of new knowledge of a certain area of food science, using modern tools and own strategies for the elaboration of this type of documents.

DCL6131 THESIS VII

Implement the final stage of a research project, generating valid and objective conclusions, based on the analysis and discussion of the results obtained, in order to provide new knowledge or solve problems related to food science. Effectively transmit the information generated when developing the research project (objectives, hypotheses, design, methodology, results and conclusions of the research), through a document and an oral presentation, using relevant, deep and substantiated arguments, with the purpose of making it available to other researchers in food science.

DCL5191 FERMENTED FOOD

Develop fermented food products from different types of food, applying the fundamentals of fermentation processes, to obtain novel and attractive products for consumers. Solve the problems faced during the preparation, packaging, transportation and storage of fermented food products, using the fundamentals of fermentation, to ensure the safety, quality and stability of the products offered to consumers.

DCL5201 SENSORY FOOD ASSESSMENT

Sensorially evaluate the food, applying the tests and methodology of the sensory discipline with scientific rigor, in order to characterize them and determine the effect of the application of various conditions and treatments on their appearance, flavor, color, aroma and texture. Analyze the results obtained in the sensory tests, applying statistical methods, in order to reach objective and valid conclusions.

DCL5211 SELECT TOPICS IN FOOD SCIENCE

Choose the right packaging, for the protection and preservation of a specific food product, through the application of packaging fundamentals and packaging materials. Estimate the shelf life of a specific food product, using the mathematical methods available for this purpose, in order to establish the maximum time that said product will maintain the quality required to be offered to consumers. To take responsibility for developing, formulating, processing and storing foodstuffs, in accordance with the legislation concerning them, in order to maintain an honest attitude towards consumers.

DCL5221 FOOD TECHNOLOGY TOPICS

Solve the problems faced during the preparation, packaging, transportation and storage of products obtained from foods of animal and vegetable origin (meats, dairy and marine products; fruits, vegetables and cereals), using the fundamentals and advances in knowledge concerning these foods, to ensure the safety, quality and stability of the products offered to consumers. Develop food products derived from foods of animal and vegetable origin (meats, dairy and marine products; fruits, vegetables and cereals), applying the fundamentals and advances in knowledge related to these foods, to obtain novel and attractive products for consumers.

DCL6141 CURRENT TRENDS IN FOOD SCIENCE

Generate new food products and solutions for food preservation, to respond to the recent needs and demands of consumers and producers, applying the concepts and foundations related to current trends in food science. Design and develop research projects, based on concepts and foundations related to cutting-edge trends in food science, to bring new information to this field of knowledge.

DCL6151 FOOD PROCESSING TOPICS

Solve the problems that arise when processing, packaging, transporting and storing food products, applying the fundamentals and advances of traditional preservation and processing methods (refrigeration, freezing, additives, dehydration, heat treatment), to ensure the safety, quality and stability of the products offered to consumers. Develop new food products, using the fundamentals and advances of traditional preservation and processing methods (refrigeration, freezing, additives, dehydration, heat treatment), to meet the demands and needs of today's consumers.

DCL6161 SELECT TOPICS I

Solve the problems faced during the processing, packaging, transportation and storage of food, in order to ensure the safety, quality and stability of the products offered to consumers, applying the fundamentals and concepts of Select Topics in Food Science. Design and develop research projects, to generate new food products and solutions for food preservation, which respond to the current needs and demands of consumers and producers, using the concepts and foundations of Selected Topics in Food Science.

DCL6171 PREDICTIVE MICROBIOLOGY

Solve the microbiological problems that arise when developing and preserving food products, using the tools of predictive microbiology, to ensure the safety, safety and stability of the products offered to consumers. Design and develop research projects, applying the theoretical and practical concepts of predictive microbiology to food science, to provide new information to this field of knowledge.

DCL6181 FOOD POWDER TECHNOLOGY

To solve the problems faced in relation to solid particles of a food nature, when processing, packaging, transporting and storing food products, applying the concepts and principles concerning these particles, to ensure the quality and stability of the products offered to consumers. Design and develop research projects, to generate new food products and solutions for food preservation, which respond to the current needs and demands of consumers and producers, using the concepts and foundations related to solid particles of a food nature.

DCL6191 SELECT TOPICS II

Generate new food products and solutions for food preservation, to respond to the recent needs and demands of consumers and producers, through research projects related to Selected Topics in Food Science. Solving problems arise when processing, preserving, packaging, transporting and storing food, with the purpose of offering consumers safe, nutritious, pleasant and stable products, applying the fundamentals and concepts of Select Topics in Food Science.

DCL6201 MICROBIOLOGY TOPICS

Create novel food products and alternative solutions for food preservation, in order to respond to the needs and demands that consumers and producers have today, using concepts and principles related to specific and cutting-edge topics in Food Microbiology. Generate and direct research applying the concepts and foundations of specific and cutting-edge topics in Food Microbiology, to bring new knowledge to this area of science.

DCL6211 EMERGING TECHNOLOGIES

Generate and direct research, applying the concepts and foundations of emerging technologies for food processing, with the purpose of providing new information to this field of knowledge. Innovate in the

processing and conservation of food, through the use of emerging technologies, in order to generate products and solutions that respond to the demands that consumers and producers currently have.

DCL6221 SELECT TOPICS III

Solve the problems that arise during the preparation, packaging, transportation and storage of food products, using the principles and concepts of Selected Topics in Food Science, to offer consumers safe, nutritious, pleasant and stable products. Create innovative food products and alternative solutions for food preservation, through the development of research projects related to Selected Topics in Food Science, to respond to what consumers and producers of today demand.

PHD IN WATER SCIENCES

DCG5011 PHYSICAL CHEMICAL PRINCIPLES

Analyze the techniques and tools necessary for the proper selection of a treatment train based on the characteristics of the water to treat and design all its units to integrate a water treatment plant.

DCG5021 BIOLOGICAL PRINCIPLES

Identify the role of biological processes in natural water purification systems. Analyze the changes in these processes that favor the accumulation of pollutants in the different aquatic systems. Identify indicators of biological systems in the planet's environment.

DCG5031 RIVER HYDRAULICS

Analyze and interpret the fundamental principles of flow in natural channels, which allow the evaluation and determination of the physical processes of the dynamics of rivers. Operate the necessary principles of fluid mechanics for flow treatment in natural channels.

DCG5041 SURFACE AND UNDERGROUND HYDROLOGY

Solve problems related to the occurrence of precipitation, infiltration and evapotranspiration. Apply the different unit hydrographs that are required to analyze the relationship rain - runoff. Use the concepts and techniques necessary for the solution of problems related to the flow of groundwater.

DCG5051 ENVIRONMENTAL IMPACT ASSESSMENT

Recognize the environmental factors that determine the level of water, air and soil pollution. Use technology for the proper control of pollutants in water, air and soil. Identify, evaluate and solve Environmental Impact problems related to environmental projects.

DCG5061 CONVENTIONAL WATER TREATMENT

Analyze the basic principles of conventional water treatment, considering the process of coagulation, flocculation and sedimentation that allow the removal of conventional contaminants from the water. Apply the knowledge acquired for the design of basic units.

DCG507 1 PHYSICAL HYDROLOGY

Analyze the theoretical concepts to carry out a water balance in hydrological basins associated with the supply and demand of water resources for different uses. Describe the different atmospheric phenomena

and the variables that govern them. Describe and apply the different equations that govern hydrological phenomena under different conditions.

DCG5081 ENVIRONMENTAL HYDRAULICS

Recognize the fundamental principles of open channel flow. Apply the fundamental principles of mixing and dispersing processes in natural channels. Apply the fundamental principles of diffusion processes in natural channels.

DCG5091 SELECT TOPICS

Identify elements necessary for the proper selection of a selected topic that allows to deepen the knowledge of the water sciences. Identify the strategies necessary to propose a comprehensive solution to a specific problem in the water sector.

PTA5011 PROFESSIONAL RESPONSIBILITY SEMINAR

At the end of the subject the student will be able to approach the solution of problems with freedom and transparency from a responsible and integral moral and ethical perspective so that in this way he can face the different challenges imposed by his professional activity, through the development of a research report. Design materials and products of professional activity taking into account their characteristics and the audience to whom it is addressed, through the writing of essays and a research report.

DCG5101 KNOWLEDGE EXAM

Analyze the elements necessary for the theoretical-practical evaluation of the knowledge acquired during the formative Academic stage. Identify and analyze various scientific articles that support proposals for solutions to the problems associated with the water sector.

DCG5141 THESIS I

Analyze the different types of research protocols. Develop skills to elaborate a research protocol associated with the solution of a national problem in the water sector. Identify the rules included in at least two models that should be considered for the development of a research protocol.

DCG5111 PREDOCTORAL EXAM

Analyze the most appropriate strategies to link theoretical and practical knowledge with the problems identified in the doctoral research line. Develop a holistic analysis in the approach of solutions associated with a problem in the water sector. Provide the necessary elements for an adequate defense of the doctoral research project.

DCG5151 THESIS II

Identify and analyze the different types of research and the elements that should be included in a state of the art doctoral thesis. Explain the requirements that a doctoral thesis must meet according to a line of research in the water sector. Explain the minimum elements required for the preparation of a scientific article.

DCG6041 RESEARCH SEMINAR I

Identify a project that defines the line of research so that at the end of the course there is bibliographical research related to the topic of interest. Make the formal proposal of the research protocol for approval by the academic core of the doctorate in water sciences.

DCG6091 THESIS III

Identify the indexed journals according to the chosen doctoral research line, as well as know the procedure to carry out a search for previous work in the specialty. Show the elements that make up a doctoral research project and review those included in the particular line of research.

DCG6051 RESEARCH SEMINAR II

To analyze the fundamental principles and factors of the experimental and observational method in the field of research. Describe the basic principles that govern the different types of experimental designs and their block techniques.

DCG6101 THESIS IV

Develop the proposed doctoral research project that allows to obtain the doctoral degree, making use of the research facilities available in the program.

DCG6061 RESEARCH SEMINAR III

Design the most appropriate research strategies that should be reflected in the advancement of doctoral research. Identify and select the appropriate strategy for the follow-up to the project and the line of research in the subject of the doctoral thesis.

DCG6111 THESIS V

Develop and demonstrate the originally proposed progress of the doctoral research project that allows the obtaining of the academic degree making use of the research facilities available in the program.

DCG6071 RESEARCH SEMINAR IV

Identify and select the appropriate strategy for the follow-up of the project and doctoral research line. Review and suggest improvements to the proposal integrated in the research protocol, and evaluate its progress for the approval of the academic core of the doctorate in water sciences.

DCG6121 THESIS VI

Identify the essential elements for the preparation and submission of a research article in arbitrary journals, as well as the mechanism and conditions for its submission. Analyze the rules governing copyright and how to reference the works consulted during the doctoral research work. Organize and integrate the necessary elements for the doctoral thesis work.

DCG6081 RESEARCH SEMINAR V

Analyze the concept of ethics applied in the water sector. Identify the regulations and rules that govern water regulation, with a focus on water ethics and the human right to water.

DCG6131 THESIS VII

Analyze the overall information of the doctoral research project. Organize and integrate with a holistic vision the doctoral thesis work and obtain the proposed academic degree.

ADVANCED ELECTIVES

DCG6141 PATHOGENS AND WATER QUALITY

Identify the relationships between pathogens and water quality, by studying the main microorganisms present in water capable of causing hydro-transmitted diseases and their effect on human health. Analyze the different conventional and unconventional treatments for water disinfection.

DCG6151 DYNAMIC ENVIRONMENTAL SYSTEMS

Analyze the approach of systemic and holistic thinking that considers the environmental problems of water management and its interaction with social and economic spheres. Model and simulate through the dynamics of systems, the interaction of environmental and socioeconomic contexts in order to determine the consequences of policies and strategies on water management. Internalize research mechanisms – action to consider the diverse perspectives of stakeholders in water management.

DCG6161 SELECT TOPICS I

Analyze and apply the necessary elements to identify a priority issue in the water sector, associated with a recurring problem. Analyze the different strategies to identify and analyze research articles on priority issues of the water sector.

DCG6171 ENVIRONMENTAL CHEMICAL KINETICS

Analyze the elements necessary for the study of chemical kinetics in aquatic and treatment systems. Analyze the theoretical framework and equations that govern the phenomenon of chemical kinetics associated with the environment.

DCG6181 PROBABILITY AND STATISTICS IN WATER RESOURCES

Analyze the necessary elements of Probability and Statistics for the integral management of water resources, as well as associate this knowledge with the hydrological cycle and water resource management models.

DCG6191 SELECT TOPICS II

Analyze the elements necessary to identify a priority issue in the water sector, associated with a recurring problem and the interaction between the quantity and quality of the water. Identify the different strategies to select and analyze research articles on priority topics in the water sector.

DCG6201 ADVANCED WATER TREATMENT

Analyze advanced water treatment processes for the removal of unconventional contaminants from water sources for human use and consumption, industry and re-use. Apply the knowledge acquired for the design of treatment units.

DCG6211 HYDROLOGICAL MODELING

Solve problems related to the occurrence of precipitation and how its respective runoff is affected by the different conditions favored by human activity. Identify and apply different tools for the integral management of water, incorporating the climate change component.

DCG6221 SELECT TOPICS III

Identify the basic and fundamental principles to analyze a priority issue in the water sector, associated with a recurring problem and interaction with the modeling of water quantity and quality. Analyze the different strategies to identify research articles on priority issues of the water sector associated with the modeling of water quality and quantity.

PHD IN CREATION AND CULTURE THEORY

DCC6012 CRITICAL HISTORY OF CREATIVE WORK

Develop a historical tour from the nineteenth century to the present day by following the most outstanding models of creative work, through the mastery of critical tools, for its comparative analysis on the fundamental changes in the practice of work and the current conditions of its development.

DCC6022 RESEARCH METHODOLOGY

Analyze the characteristic elements of different methodologies used in research projects, in order to generate an advance of the research approach of different processes and problems of contemporary culture, through the review of the main methodological currents.

DCC6032 CULTURAL CREATION AND SOCIAL INVOLVEMENT

Design a research-creation project by setting in motion Creative practices that are linked to a selected social community, to identify the results of how the sharp separation between creator and public is dissolved.

DCC6042 CONTEMPORARY CULTURAL INSTITUTIONS

Analyze the most outstanding public and private, commercial and non-commercial strategies of cultural management and self-management, such as coworking or media lab, and the most representative institutions related to culture and its consumption, to develop reflective written texts on these fields of study, through the identification of concrete case studies.

DCC6062 THESIS I

Identify the research topic and problem, according to its relevance and viability, by delimiting the assumptions to start the doctoral thesis project.

DCC6072 THESIS II

Analyze the background of the topic of the research project, by identifying the state of the art and the argumentative research needed in order to raise the process of fieldwork and the research problem.

DCC6082 RESEARCH SEMINAR I

Explain the advances and results obtained in your thesis project from the bibliographic review, through the elaboration of an academic article, to disseminate the results of the research.

DCC6092 THESIS III

Apply different methodologies according to the research criteria of the literature that is based on the particular project that is being developed in the area of Creation and Theories of Culture in order to contrast and analyze the results.

DCC6102 RESEARCH SEMINAR II

Effectively transmit the information generated in the initial stage of the research project, through the preparation of an academic research article that is argued in a relevant and substantiated way about the methodology selected to carry out the research, in order to submit it to the consideration of other experts in the field.

DCC6112 THESIS IV

Argue the development of the thesis project in the areas of creation and theories of culture, through the design of measuring instruments, as well as observation to justify the product of research.

DCC6122 RESEARCH SEMINAR III

Explain the results obtained during the research in the areas of creation and theories of culture, through argumentative research and theoretical support, in order to present them at a conference or congress.

DCC6132 THESIS V

Define the final structure of the student's doctoral thesis applied in creation and theories of culture, by evaluating all its parts and methodological processes to elaborate the introduction and conclusion of said thesis. Expose the development of the doctoral thesis, through the use of argumentative and syntactic methodologies to defend the thesis work.

DCC6142 RESEARCH SEMINAR IV

Conclude the research and processing of the thesis in Creation and Theories of Culture, by substantiating the updated bibliography to define the introduction and the conclusions or recommendations thereof. Expose the final product of research in the area of Creation and Theories of Culture, by pointing out its methodology used to defend its doctoral thesis.

ELECTIVES

DCC6152 TECHNOLOGY AND KNOWLEDGE PRODUCTION

Evaluate the conditions of knowledge production, through the development of qualitative research that studies the relationship between these conditions and the local, national and international environment, through the identification of the role of technology as enhancing or limiting intellectual work, in order to develop exercises and critical writings reflective on these problems.

DCC6162 CRITICISM, CULTURE AND POLITICS

Critically assess cultural phenomena, through fieldwork and other observations of political processes, the articulation of power networks and contemporary socio-economic contexts, to propose thoughtful written studies and oral interventions of broad spectrum.

DCC6172 BODY POLICIES

It applies contemporary theories of the corporeality of body policies and exposes its theoretically argued conclusions, through a critical analysis of the role of the body in history and in modern and postmodern thought, in order to prepare reports and essays that serve as proposals related to the research of the thesis.

DCC6182 WAYS TO DO: CREATION AND PERFORMATIVITY

Develop research works related to the debate and the presence of creativity and performativity in contemporary art and culture, through a written reflection and an oral intervention, to carry out field studies.

DCC6192 GLOBALIZATION AND SOCIAL PROCESSES

Describe the processes that are immersed in social globalization, through the analysis of concepts and themes of globalization and social processes to settle the strategies of study and research in this field.

DCC6202 EXCESSIVE MODERNITIES

Identify the characteristics of modernity and postmodernity in contemporary art and culture from the most relevant authors to carry out studies in the sociocultural environment, through written reflection and oral intervention of a broad spectrum.

PHD IN INTELLIGENT SYSTEMS

DSI5011 DYNAMICAL SYSTEM MODELING

Identify how the inputs to systems affect the outputs, or identify which inputs must be provided to generate a desired output, through models with Ordinary Differential Equations, which satisfy certain conditions of linearity and invariance in time. Analyze real dynamic phenomena and dynamical systems through the study of the properties of the mathematical representations of such dynamical systems, and learn to translate concrete situations into appropriate mathematical representations to answer questions that arise in real situations.

DSI5021 ARTIFICIAL INTELLIGENCE

Analyze the field of Artificial Intelligence and the study of principles and techniques in three central areas: problem solving, knowledge representation and machine learning through the fundamentals for the study of more advanced Artificial Intelligence.

DSI5031 MULTIMEDIA SIGNAL PROCESSING

Analyze the fundamental principles and techniques of multimedia Signal Processing and compression, current standards and technologies, and describe future technologies. Solve problems related to multimedia Signal Processing, through projects. Assess the impact and implications of technologies related to Multimedia Signal Processing in different contexts to delimit the scope and limitations of projects in the area.

DSI5041 OPTIMIZATION TECHNIQUES

Identify optimization theory as a design principle through theory, examples and tasks to solve problems from simple applications to industrial problems. Design and analyze convex optimization algorithms using concepts and principles that are easy to visualize and understand in order to achieve the algorithmic and analytical core of continuous optimization and horseback point theory. Act responsibly during the formulation of engineering problems through mathematical optimization formulations.

DSI5051 ARTIFICIAL VISION

Analyze the theory and mathematical techniques of digital image processing and computer vision, by exposing technology and software used in image analysis and manipulation. Apply methodologies in the area of artificial vision and techniques of digitization, standardization and modification of images using the basic mathematical operators, as well as the techniques and methods of segmentation, improvement, restoration, recovery, interpretation and recognition of visual information in areas such as medicine, biology, robotics, public safety, computer human interaction, distance education to solve computer vision problems. Assess the impact of solving problems in today's world by applying digital image processing and pro-computer vision techniques.

DSI5061 PATTERN RECOGNITION

Identify the most used techniques for Pattern Recognition tasks by presenting different methods, so that critical choices are made of the techniques to be used when facing real applications in the areas of Image analysis, audio and speech recognition, Data Mining, data recovery and bio-computing.

DSI5071 SOFT COMPUTING

Identify concepts and techniques of soft computation and potentiate skills in the design and implementation of solutions to real problems based on soft computation. Choose and apply methodologies of systems inspired by natural intelligence, also characterized by the use of inaccurate and/or approximate solutions, through theoretical analysis and the use of software, to solve tasks of high computational complexity, where there is not enough information about the problem. Show empathy, responsibility and ethics during the design of systems to be used for the solution of real problems through principles, concepts and techniques based on soft computation.

PTA5011 PROFESSIONAL RESPONSIBILITY SEMINAR

It identifies the main characteristics of the design, elaboration and communication of the materials and products of its professional activity taking into account the type of material and the audience to whom it is addressed. It approaches the solution of problems with freedom and transparency from a responsible and integral moral and ethical perspective so that in this way it can face the different challenges imposed by its professional activity. The student designs, elaborates and communicates materials and products of his professional activity taking into account the type of material and the audience he is addressing. The students are fully aware of the responsibility involved in the exercise of their Profession from a moral and ethical perspective. He reflects on the professional activity and the society in which he is immersed with dignity, freedom and respect, strengthening his humanist vision and professional vocation.

ISD5121 KNOWLEDGE EXAM

Master the theoretical and practical knowledge acquired in the different courses of the non-elective disciplinary training level, as well as in the most recent scientific production associated with each course. Master the work to prepare a dissertation by handling information and appropriate methodologies in the field of knowledge. Recognize the importance and impact of independently conducting original and relevant research.

DSI5161 THESIS I

Plan a dissertation through concentrating on the generation of an appropriate topic for research with the prospect of finishing it in a second period. Design and apply the process related to the process of scientific research in computing. At the end, the student will have elaborated and presented his formal proposal, with an investigation of the theoretical framework and a conceptual analysis of the subject that he carries out as a predoctoral research project. Act with ethics, integrity during the preparation of a research proposal.

DSI5131 PREDOCTORAL EXAMINATION

Validate a postgraduate student's ability to conduct research independently and evaluate the viability of the student's proposal as a doctoral dissertation. Master the formulation and description of a specific research topic, which is manifested in a written proposal and oral presentations, through the analysis of

relevant literature and the use of research methodologies. Recognize the importance and impact of independently conducting original and relevant research.

DSI5171 THESIS II

Deeply analyze the area and line of research with the purpose of investigating problems independently, resulting in a contribution to the area of knowledge and a research-based thesis. Develop the predoctoral research project under the supervision of an advisor. This work will be possible through the integration of various computational techniques, software engineering, as well as the detailed investigation of an area of knowledge, so that in the end the student develops skills as a researcher and generates research results. Demonstrate a conduct and understanding of professional ethics as applied to the program through its performance during the development of a research project.

DSI6041 RESEARCH SEMINAR I

Identify the methodologies for selection of research articles in the area of interest by collecting recent literature and related to the particular line of interest to identify the background to a research project, as well as to suggest proposals for research papers. Evaluate and assess research articles, as well as the procedures for the preparation, elaboration and publication of an article through review of bibliography in the area of interest and discussions with faculty and students. In this way, the process of training a researcher is initiated. Recognize the previous work of researchers in the area of interest by valuing their contributions and identifying trajectories to continue with these works, contributing and reinforcing previous knowledge.

DSI6091 THESIS III

Identify the general outline of the research methodology, through the mentor's guide and sessions with the research group to which the student belongs, for the elaboration of a research project and the corresponding thesis document. Develop a solid and comprehensive research plan following the rubric and doctoral proposal guidelines to meet the standards and scrutiny of the evaluation committee, professors and colleagues. Act with autonomy and rectitude during the preparation of a doctoral research proposal, following ethical and conviction codes.

DSI6051 RESEARCH SEMINAR II

Identify and apply the methodology for the approach of a hypothesis that gives rise to a research project through participation in projects to start a process of knowledge generation. Develop techniques of critical thinking, research, writing and documentation by opening up to problem-solving strategies, formal questioning and the research of other academics. As part of the development of the final deliverable, consisting of a detailed project proposal with the approach of hypotheses and methodologies, a series of questions will be created that are of vital importance to the researcher. Produce contributions within an area of knowledge through a behavior based on ethical principles to positively impact a technological area, discipline of knowledge and society.

DSI6101 THESIS IV

Identify the concept, the process and the impact of the approach of a hypothesis in the execution of a project by evaluating it to identify its strengths and weaknesses in order to continue on the same hypothesis, or discard it. Develop a hypothesis in the solution of scientific problems through the guidance and interaction of the thesis mentor for the execution of a research project that is innovative. Contribute to social development through research and education and in qualified professional capacity.

DSI6061 RESEARCH SEMINAR III

Develop techniques of critical thinking, research, writing and documentation by opening up to problem-solving strategies, formal questioning and the research of other academics. As part of the development of the final deliverable, it will consist of a detailed project proposal with the approach of hypotheses and methodologies, a series of questions will be created that are of vital importance to the researcher. Develop comparative analyses on different research projects that solve the same problem by identifying and collecting the most recent and innovative works to determine the line of research to follow and the elaboration of different hypotheses. Appreciate and value research works that will be the starting point for personal research.

DSI6111 THESIS V

Analyze and recognize essential facts, concepts, principles and theories related to the topic "scientific methodology" in order to be able to be an apprentice researcher. Apply the scientific method in the realization of a research project by interacting with the thesis advisor to demonstrate innovation and contributions of scientific work. Act responsibly and ethically during the conduct of the scientific method for the integral and legitimate completion of research projects and works.

DSI6071 RESEARCH SEMINAR IV

Analyze tools, such as researchers' social networks and/or platforms for evaluating articles, for interaction and collaboration with other researchers. Integrate and participate in research networks through the use of platforms, technology and protocols to enrich experiences when it comes to criticizing and/or assimilating the research of other academic peers. Show interest and commitment when generating and acquiring knowledge through interaction with colleagues, teachers and students to enrich the experiences of the team.

DSI6121 THESIS VI

Identify dynamics and tools for teamwork and interaction with other colleagues during the execution of research projects, through participation in research social networks and in idea sessions with colleagues and the thesis mentor, with the goal of achieving research results that are of common interest. Collaborate directly or indirectly in groups for the execution of research activities through the application of various techniques that ensure the integrity of the scientific methodology by team. Act with commitment, dedication and tolerance during teamwork to enrich the research experiences of all team members and to generate promising results, planning organized together, work meetings and assignment of tasks.

DSI6081 RESEARCH SEMINAR V

Identify different examples of development of research project protocols, identifying different sections, structure and styles. Plan, develop and execute executive proposals for research and technological development projects through a perspective oriented to seek financial efficiency and emerging technological trends and new lines of research with the purpose of developing research with a high scientific, technological and socio-economic impact. Act with integrity and sensitivity during the development of research project protocols, understanding the implications of the development of such a project.

DSI6131 THESIS VII

Broadly recognize concepts, principles, and theories related to advanced topics of intelligent systems to be considered an authority on intelligent systems. Show interest in the culmination of a research project

through interaction with the thesis advisor, colleagues and academic peers to generate an innovative scientific product as well as scientific and technological impact. Demonstrate ethics, responsibility and commitment to conduct independent research by advancing knowledge in the area through doctoral research.

BASIC ELECTIVES

DSI5181 HEURISTIC COMPUTER METHODS

Analyze how heuristic and search algorithms are implemented efficiently to obtain optimal solutions in discrete optimization problems. These algorithms are useful for finding approximations in problems of the "NP-hard" type, for which exact solution methods are not known.

DSI5191 AUGMENTED REALITY

Recognize and define the concept of human-computer interaction for eventual analysis of its applications in different engineering problems through discussions and presentations by the teacher and students. Design programs for human-computer interaction with methods based on user interfaces in three dimensions for applications in various fields such as visualization and video games and their respective implementation in personal computers or smartphones.

DSI5201 INTELLIGENT ENERGY SYSTEMS

Identify the basic principles for the generation, distribution and transmission of energy in towns and cities through the integration of intelligent systems and power generation systems. Design systems for real-time data processing to monitor and optimize the generation, transmission and distribution of electrical energy in buildings through the use of technology based on energy sustainability. Assess the need for the generation of renewable and/or clean energy as well as the efficient use of it to achieve technological and energetical sustainability through the use and application of Artificial Intelligence in the operation and the functioning of energy generation and use systems.

DSI5211 STATISTICAL LEARNING METHODS

Identify the operating principles of a learning machine, based on probability functions for the eventual design and implementation of statistical learning algorithms. Develop learning algorithms and analyze their performance and statistical properties by handling convex optimization and techniques for handling very large data sets. The algorithms to be designed will be applied to solve scientific and technological problems such as detection of anomalies in medical images or recognition of human activities in videos. Contemplate the implications that are generated from the application of statistical learning machines in contexts such as biomedicine, communications, etc. and be sensitive to the needs and problems of such contexts.

DSI6141 DATA MINING

Identify the fundamental concepts inherent in Data Mining through the implementation of algorithms commonly used in Data Mining tools for their eventual application to real problems. Apply methods from statistics and Artificial Intelligence that are of value in pattern recognition for decision making from an application perspective through the search for opportunities to experiment with software and cases for Data Mining. Assess the impact of the concepts, principles and theory of Data Mining in the solution of real problems through experiments and real contexts where there is viability of applying tools based on Data Mining.

DSI6151 BIO-INSPIRED HARDWARE

Identify the concepts, principles and theory related to algorithms that can be used for the autonomous design and adaptation of intelligent systems. Design and simulate systems inspired by natural intelligence by using programmable logic and Hardware Description Languages (VHDL) to achieve the combination of technologies related to bio-inspired systems and digital technology based on reconfigurable systems (FPGA) and digital signal processors. Show conviction about the applications, uses and impact of biologically inspired systems through the application of learning methods used for search, optimization and classification.

DSI6161 SELECT TOPICS I

Identify the fundamental concepts, and applications of information processing techniques and digital signals in multimedia and communications systems. Develop previous skills and knowledge to explore technological and research topics that are novel and of recent interest in scientific communities, particularly in the area of Multimedia Signal Processing, with a critical and interdisciplinary point of view to generate new knowledge, skills, research opportunities and contributions. The objectives and contents will be based on the interests of the students and the lines of research of the program. Assess the impact and implications of information processing and multimedia signals in applications in different contexts such as equalizers, noise filtering, signal compression in videoconferencing, radar and sonar applications.

DSI6171 AGENTS AND MULTI-AGENT SYSTEMS

Identify advanced topics in the investigation of multi-agent systems for application in solving real problems through the use of logic and algorithm design. Develop research to design and implement multi-agent systems applied in real situations. Assess the implications and impacts of the application of technology based on multi-agent systems through the exploration of problems in real contexts.

DSI6181 EVOLUTIONARY ROBOTICS

Identify and analyze the concepts, principles and theory of robotic systems through action and planning in robot design. To investigate the theory and existing methods for the design of autonomous machines based on the design and implementation of evolutionary algorithms for the creation of robots with evolution in the body, brain and behavior. To assess the importance and relevance of how cognitive sciences, control theory, and mechatronic systems help in the design and implementation of more efficient robotic systems as well as the importance of biology in learning to design robots.

ISD6191 SELECT TOPICS II

Interpret the principles of bio-inspired computer systems to use bio-inspired techniques in the design and implementation phase of a computational device through understanding the relationship between computer systems and natural processes. Apply previous skills and knowledge to explore technological and research topics that are novel and of recent interest in scientific communities, particularly in the area of bio-inspired systems, with a critical and interdisciplinary point of view to generate new knowledge, skills, research opportunities and contributions. The objectives and contents will be based on the interests of the students and the lines of research of the program. Assess the impact and implications of the use of computational processes, inspired by natural intelligence, in applications in different contexts such as genetic algorithms, recognition, classification, detection, prediction.

DSI6201 AMBIENT INTELLIGENCE

Identify the vision and the most recent advances of pervasive, wearable and ubiquitous computation, and their role in the construction of intelligent environments, by observing and analyzing the fact that people are surrounded by everyday objects that respond according to the presence and behavior of each user for the design of technology that provides intelligence to the everyday environment (automobiles , global

positioning system (GPS) applications, refrigerators, smart homes, etc.) as well as making it sensitive to people. Design software-hardware architectures and apply the necessary technology in the conception and realization of intelligent environments at various levels of architecture (sensors, home automation, sensor networks, information analysis, user interfaces), through the use of design methodologies. Recognize the importance and impact of ambient intelligence, emphasizing its multidisciplinary nature and application areas and technologies, the evolution of the consumption of electronic technology, sensor networks and the ability to represent and process information on a large scale to enable the design of intelligent environments that efficiently operate variables of energy, comfort, safety and interaction with users in a wide range of applications from homes to buildings smart cities, smart cities and smart transport systems.

ISD6211 COMMUNICATION NETWORKS

Develop the theoretical and practical knowledge of the technologies of interconnectivity of computer networks in addition to telecommunications protocols including mobile environments and security in information exchange, through the use of previous knowledge such as modulation theory, transmission of information, signals and systems; so that finally the student can manage, operate and maintain a wireless communications system. Design telecommunications systems and computer networks through the use of different protocols, technologies and communications architectures to improve efficiency in connectivity and information exchange. Recognize the impact and implications related to the application, evolution and management of telecommunications technology and computer networks in different social, economic and environmental contexts.

DSI6221 SELECT TOPICS III

Analyze the research area of intelligent agents through reading and discussing a selection of research articles, as well as the implementation of a system with agent programming. Apply previous skills and knowledge to explore technological and research topics that are novel and of recent interest in scientific communities, particularly in the area of environments and intelligent agents, with a critical and interdisciplinary point of view to generate new knowledge, skills, research opportunities and contributions. The objectives and contents will be based on the interests of the students and the lines of research of the program. Assess the impact and implications of the use of computational processes, inspired by natural intelligence, in applications in different contexts such as genetic algorithms, recognition, classification, detection, prediction.

ENERGY ENGINEERING

ESP0011 SPANISH I

At the end of the course, the student is able to manage information in order to elaborate argumentative texts within his discipline, adapting the necessary writing rudiments that allow him to achieve his persuasive intention in the context of the Academic interactions of his area.

LIY1011 INTRODUCTION TO ENERGY ENGINEERING

Contrast the various forms of energy that have been exhibited throughout history by reviewing, studying and analyzing them, in order to identify their characteristics, advantages and disadvantages

LQU1021 GENERAL CHEMISTRY LAB

At the end of the course, the student is able to demonstrate the skill acquired to manipulate glass material and some instruments of basic use in the Laboratories, determine physical properties, perform calculations for the preparation of solutions, apply separation methodologies and observe good Laboratory Practices.

LEX0111 FOREIGN LANGUAGE I

At the end of the course, the student is able to transmit and understand known and/or new information orally and in writing.

MAT1041 PRE-CALCULUS

At the end of the course, the student is able to demonstrate that he uses elementary mathematical concepts and techniques that allow him to solve problems related to his Profession, efficiently operate the algebra of sets in the solution of problems typical of his professional practice, use the concepts of algebra to build graphs of functions related to current problems.

LQU1011 GENERAL CHEMISTRY

At the end of the course, the student is able to correctly understand and handle the essential topics of chemistry, such as the properties of matter, its chemical and physical characteristics, quantum theory and electronic structure, the energetic and dynamics of chemical reactions and the conditions of chemical equilibrium.

MAT0011 QUANTITATIVE REASONING

At the end of the course, the student is able to pose and solve problems, to translate statements into symbolic relationships, to efficiently manage symbols, to use graphs and symbols to communicate quantitative data and to interpret graphs.

MAT1051 LINEAR ALGEBRA

At the end of the course, the student is able to solve systems of linear equations with MATLAB, solve matrix equations, handle the properties of determinants, solve concrete problems of angle, distance, intersection, relative position, recognize and verify the structure of vector spaces, bases and dimensions, build the matrix of a linear transformation.

LQI1021 MATTER BALANCE

At the end of the course, the student is able to develop a clear and systematic methodology to formulate and resolve the Matter Balances for different processes.

MAT1061 CALCULUS I

At the end of the course, the student is able to analyze various situations and related problems and to apply differential and integral calculus in the solution of problems.

ESP0021 SPANISH II

At the end of the course, the student is able to select and manage information to guide their expository and argumentative skills for the elaboration of texts of their discipline; managing them as expressions for the construction and dissemination of academic and scientific knowledge.

FIS1011 PHYSICS

At the end of the course, the student is able to handle the basic concepts related to Classical Mechanics, Electromagnetism and Optics formalizing the handling of the laws of Classical Physics.

LEX0121 FOREIGN LANGUAGE II

At the end of the course, the student is able to transmit and understand known and/or new information orally and in writing.

LQI2011 ENERGY BALANCES

At the end of the course, the student is able to formulate and resolve the energy balance by identifying the different forms of energy interactions, between a system and its surroundings, through its borders, energy transfers such as heat and work, to achieve changes in internal energy. Using property information using tables, thermodynamic diagrams and some predictive methods ideal for pressure-volume-temperature (PVT) properties, heat capacity at constant pressure and volume (Cp, Cv), ideal properties, internal energy (U), enthalpy (H); the student will learn and develop a clear and systematic methodology to solve energy balances for different process equipment.

MAT1071 CALCULUS II

At the end of the course, the student is able to analyze various situations, real problems and apply the differential and integral calculus of several variables in the solution of problems and in decision-making.

LIS1011 INTRODUCTION TO PROGRAMMING

At the end of the course, the student is able to master the basic concepts of structures, conditions, variables, and headings to make programs that solve problems in general.

LQI2021 THERMOPHYSICAL PROPERTIES LAB

At the end of the course, the student is able to handle laboratory equipment and accessories; as well as to interpret the results obtained, by relating them to the basic knowledge of thermodynamics.

LEX0131 FOREIGN LANGUAGE III

At the end of the course, the student is able to transmit and understand known and/or new information orally and in writing.

LQU1051 ORGANIC CHEMISTRY I

At the end of the course, the student is able to distinguish the different functional groups and structures of organic compounds and identify different organic reactions and their mechanisms, properly manage nomenclature, stereochemistry, structure and reactivity in acid-base processes.

INF0011 INFORMATION TECHNOLOGIES IN THE CONSTRUCTION OF KNOWLEDGE

At the end of the course, the student is able to use Information and Communication Technologies in the processes of research, decision-making, generation of ideas and proposals; combining its processing capabilities to access, validate, share and use information effectively and ethically.

LIY2011 ELECTRICAL CIRCUITS I

Identify the elements that make up a circuit, through the analysis and decoding of each of its parts, to make designs of Electrical Circuits that involve resistors, capacitors, inductors, dependent and independent sources and signals in a stable state.

MAT2051 ORDINARY DIFFERENTIAL EQUATIONS

At the end of the course, the student is able to solve ordinary equations of the first order and differential equations of the second order inhomogeneous by the methods of variation of parameters of indeterminate coefficients and by means of power series; to pose and solve problems of exponential growth, cooling, mixtures and orthogonal trajectories, mechanical problems of mass-spring, circuits and mixtures; of obtaining the Laplace transform of a function from the definition and using tables, to solve problems of initial values for linear differential equations and for integral-differential equations.

LIY2031 INTEGRATED ELECTRONICS

Describe the operation and propose elements considering electronic systems that support energy storage, distribution, control and management activities; through the use of simulation tools to achieve greater efficiency and reduce energy production costs.

EDS0011 ETHICS FOR SUSTAINABLE DEVELOPMENT

At the end of the course, the student is able to identify and analyze the general guidelines for the study of sustainable development, both theoretically and practically; the relevance of ethical behavior in the design and implementation of sustainable development; Mexico's shortcomings and progress in terms of sustainable development; policies conducive to carrying out significant socially responsible changes in terms of sustainable development.

III2031 ECONOMIC AND FINANCIAL ENGINEERING

At the end of the course, the student is able to identify and use the interest rate as an evaluation tool, schedule investments with the inclusion of time as a factor of analysis, define the different types of interest in the market and analyze their impact on the investment, distinguish the true cost of an interest rate in the investment, assess and direct financial requirements over time.

LIY2021 ELECTRICAL CIRCUIT LAB I

Design basic Electrical Circuits, through the practice and mastery of the interconnectors of a circuit, in order to examine the behavior of the same in order to use different laboratory tools.

LIY2041 THERMAL MACHINES AND TURBINES

Assess the different classes of Thermal Machines and turbines, using thermodynamics as a basic technique to perform energy analysis, calculation of the efficiency of thermal machines, turbines and thus distinguish the basic and complex thermodynamic cycles used in power generation.

AHC0011 ART, HISTORY AND CULTURE

At the end of the course, the student is able to identify and analyze communication and action strategies, as well as the influence of political, social and economic change on the transformation of models, conceptualization of cultural artifacts and its conservation.

LQI3031 FREE ENERGY BALANCES

At the end of the course the student is able to identify the thermodynamics of multicomponent mixtures and the conditions for the transfer of mass to thermodynamic equilibrium, to describe the equilibrium in

multicomponent and multiphase systems, as well as models to predict the equilibrium constants of the components in the heterogeneous system and to calculate for systems with chemical reaction the effect of temperature and pressure on the equilibrium constants of systems of a reaction or various reactions.

LIY3021 ELECTRICAL CIRCUITS II

Apply the Laplace transform in the circuit analysis and cascade connections to several of them by using the two-port network parameters to solve design-derived problems.

LIY3041 IMPLEMENTATION AND CONTROL

Interpret the characteristics of an electronic implementation system by describing the control alternatives that have been developed in current energy systems in order to improve their efficiency.

LIY3031 ELECTRICAL CIRCUIT LAB II

Design alternating current, single-phase and three-phase electrical circuits, through the simulation of interconnecting the different elements of an electrical circuit (resistors, capacitors, inductors, power sources and transmission lines), for the construction of more complex current circuits.

LQI3051 TRANSPORT PROCESSES LAB I

At the end of the course, the student is able to identify, operate and experiment with equipment, at the pilot plant level, related to the processes of transport of moment and heat in order to interpret the results and evaluate their performance; to relate this knowledge with the knowledge of the Transport Processes I course.

LQI3041 TRANSPORT PROCESSES I

At the end of the course, the student is able to identify the mechanisms of the processes of transport of the moment and heat in order to use them in the associated transfer processes and apply them to the solution of industrial and environmental problems.

LIY3011 PROCESS SAFETY AND ENVIRONMENTAL PROTECTION

Operate the guidelines of safety and environmental protection in energy industries, analyzing the current regulations by reviewing government models and existing systems to apply them in the design of electricity generation processes.

LIY3061 GEOTHERMAL, HYDRAULIC AND NUCLEAR ENERGY

Design energy production systems using geothermal, hydraulic or nuclear energy to implement new forms of electricity generation.

LIY3071 SOLAR AND WIND ENERGY

Propose solar and wind energy production designs, through the application of different energy spreading systems to properly take advantage of renewable resources and reduce monetary costs in their generation, distribution, storage and quality.

LQI3131 UNIT OPERATIONS LAB

At the end of the course, the student is able to identify, operate and experiment with equipment, at pilot plant level, related to fluid flow in order to interpret the results and evaluate their performance, in relation to the knowledge of the Unitary Fluid Flow Operations course.

LQI3141 TRANSPORT PROCESSES LAB II

At the end of the course, the student is able to identify and operate equipment at pilot plant level related to the transport processes and interpret the results as well as evaluate their performance, relating them to the knowledge of the Transport Processes II course.

LIR4041 ELECTRICAL MACHINES

At the end of the course, the student is able to select, operate and maintain electrical machines such as transformers, motors, generators for different applications.

LIY3051 FLOW AND HEAT UNIT OPERATIONS

Identify the equipment used in the transport of fluids and in the heat of a current, through the analysis of cases that occur in different industrial processes to achieve an increase in the efficiency of the energy distribution processes.

LQI3101 TRANSPORT PROCESSES II

At the end of the course, the student is able to identify the mechanisms of the mass transport processes and to apply them in the associated transfer processes; and to calculate solutions to industrial and environmental problems.

LIY4031 BIOENERGIES

Build calculation models based on the knowledge acquired, through the operation of biofuel production processes, to propose conditions in the processes being economically variable and sustainable towards the community.

LIY4021 PETROCHEMICAL PROCESS ENGINEERING

Employ modern strategies, through the use of process simulators that allow the rapid and reliable calculation of parameters in the synthesis and evaluation of different petrochemical processes used in the industry, which allow saving and maximizing resources.

LIY4051 PETROCHEMICAL PROCESS ENGINEERING LAB

Use process simulators analyzing thermophysical properties and evaluate petrochemical processes by comparing different flowcharts and operating conditions to maximize their energy efficiency.

LQI4021 MASS TRANSFER UNIT OPERATIONS

At the end of the course, the student is able to master the fundamentals of unitary operations involving mass transfer in fluid phases in equilibrium stages; to describe the principles and to calculate with different methods the design of distillation, absorption, extraction and humidification equipment.

LIY4011 PROFESSIONAL PRACTICES I

Put into practice the knowledge acquired so far in your curriculum to diagnose, plan, evaluate and propose a solution to a problem related to your Profession, establishing a link between theory and practice, between the university and society, between your aspirations and the needs of the environment through the development of a project.

LIY4061 PETROLEUM CHEMISTRY AND CATALYTIC REACTORS

Identify the operating conditions of catalytic reactors by building various models, methods of characterization of petroleum fractions, metals, heteroatoms, asphalts; to improve the process of elaboration and innovation of the products of the same and its derivatives.

LIY4041 SELECT TOPICS I

Delve into specific current and relevant issues of energy engineering, through the analysis of current regulations in Mexico and the world, in order to respond to the demanded needs of the public and private sector in energy matters.

LIY4101 ANALYSIS AND MANAGEMENT OF ENERGY PROJECTS

Design an energy management project to reduce energy consumption, increase the reliability of an electrical system, improve the use of equipment, predict system performance, as well as optimize energy use by using ISO 50001.2011 which provides a standardized regulatory framework in the best practices of energy management.

LIY4071 PROFESSIONAL PRACTICES II

Put into practice the knowledge acquired so far in your curriculum to diagnose, plan, evaluate and propose a solution to a problem related to your Profession, establishing a link between theory and practice, between the university and society, between your aspirations and the needs of the environment through the development of a project.

LIY4091 FOSSIL ENERGY PROCESSING

Analyze the unitary operations that make up the processing of fossil energies, in order to be able, through practical exercises, to identify the possible improvements that can be implemented or solve problems related to their operation.

LIY4081 PETROLEUM REFINING

Distinguish the different processes involved in the refining of oil through the analysis of the characteristics that compose them to design final products with quality, sustainable, safe and that take into consideration environmental protection.

LIY4111 SELECT TOPICS II

Evaluate the characteristics present in a deposit and the mechanical properties of the rocks that make it up in order to develop and apply its own methodologies for its exploitation, as well as to delve into current specialized issues of energy matters.

LIY4121 SELECT TOPICS III

Develop strategies and propose viable solutions on specific cases of lighting, heating, ventilation and air conditioning, through the energy management process, to delve into current specialized topics of electrical network design.

MASTER IN BUSINESS ADMINISTRATION

MNS5122 SELECT TOPICS
Discuss concepts of entrepreneurship, human resources, operations, technology, finance or marketing current and/or complementary to the curriculum, through the presentation of theories, models, case solutions and group discussions, to complement the training of the student.

MNS5132 ADVANCED SELECT TOPICS
Discuss current business concepts and/or complementary to the curriculum, through presentation of theories, models, case solutions and group discussions, to complement the training of the student.

MNS5142 LEADERSHIP AND TALENT MANAGEMENT
Describe current theories on leadership and talent management, to design and implement the processes of attracting, developing and retaining talent in an organization from a strategic perspective by analyzing the different leadership styles and current theories in talent management.

REP5012 CORPORATE AND PROFESSIONAL RESPONSIBILITY
Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MNS5152 FINAL PROJECT
Discuss methodologies of selection, development and solution of case studies and business projects, through the presentation of theories, methodologies and review of proposals to develop academic documentation of concrete business application, particularly in the area of business administration.

PROJECT MANAGEMENT

MNS5012 STATISTICS AND DECISION ANALYSIS
Analyze the quantitative tools of probability, statistics, linear programming and econometrics, through the use of specialized statistical software tools, to solve problems of specific business situations.

MNS5022 MANAGEMENT MODELS
Describe and analyze the different principles, models, techniques and tools to create and develop models of senior management, through the active reflection of management models of organizations of the XXI century, for the creation of a competitive advantage.

MNS5032 FINANCIAL MANAGEMENT
Analyze and interpret financial information, through the use and application of the main concepts of financial mathematics, to understand and apply the main financial accounting concepts, during business decision-making.

MNS5042 MANAGEMENT ECONOMICS

Describe the different market structures and their characteristics, combine knowledge about supply and demand with market behavior, their inputs and products, and recognize the interrelationship of production and costs in the company's decision-making; by explaining theories, practical examples and group dynamics; to establish the different alternative strategies that will determine the performance of the company and identify under an economic approach the different internal and external factors that affect the performance of the company.

MNS5052 PROJECT MANAGEMENT AND CONTROL

Describe the aspects of planning, control and management of a project, through the analysis of specialized methodologies in project management, in order to apply them in the context of your area of specialty and/or work.

MNS5062 MARKETING MANAGEMENT

Identify and formulate marketing strategies, based on market knowledge, that include developments and decisions about products and services, brands and value; as well as, the mechanisms of promotion, prices, distribution and communications, through the analysis of the strategic activities of the market to select those that satisfy both the needs of the current target markets and of new potential markets.

MNS5072 PROJECT RISK MANAGEMENT

Discuss the methods and techniques to evaluate and manage investment projects under conditions of risk and uncertainty, explain the concepts, techniques and tools of Monte Carlo simulation, through the exposition of concepts, case analysis and group activities to evaluate and manage investment projects under conditions of risk and uncertainty.

MNS5082 PROJECT QUALITY ASSURANCE AND CONTROL

Discuss activities, practices and tools to ensure and control the quality of projects. This through describing theories, solving practical exercises and group discussions; so that the student is able to take charge of all the activities that determine the policies, objectives and responsibilities related to quality.

STRATEGIC MANAGEMENT

MNS5012 STATISTICS AND DECISION ANALYSIS

Analyze the quantitative tools of probability, statistics, linear programming and econometrics, through the use of specialized statistical software tools, to solve problems of specific business situations.

MNS5022 MANAGEMENT MODELS

Describe and analyze the different principles, models, techniques and tools to create and develop models of senior management, through the active reflection of management models of XXI century organizations, for the creation of a competitive advantage.

MNS5032 FINANCIAL MANAGEMENT

Analyze and interpret financial information, through the use and application of the main concepts of financial mathematics, to understand and apply the main financial accounting concepts, in business decision-making.

MNS5042 MANAGEMENT ECONOMICS

Describe the different market structures and their characteristics, combine knowledge about supply and demand with market behavior, their inputs and products, and recognize the interrelationship of production and costs in the company's decision-making; by explaining theories, practical examples and group dynamics; to establish the different alternative strategies that will determine the performance of the company and identify under an economic approach the different internal and external factors that affect the performance of the company.

MNS5092 STRATEGIC PLANNING AND MANAGEMENT

Describe models and techniques of planning and strategic direction, through the exposition of concepts, the analysis of theories and the discussion of cases, in order to: 1) diagnose the problems of an organization and formulate a plan to solve them at short and long term, 2) identify new business opportunities; and 3) apply and develop the main conceptual, methodological and technological tools for strategy in an organization.

MNS5062 MARKETING MANAGEMENT

Identify and formulate marketing strategies, based on market knowledge, that include development and decisions about products and services, brands and value; as well as, the mechanisms of promotion, prices, distribution and communications, through the analysis of the strategic activities of marketing to select those that satisfy both the needs of the current target markets and of new potential markets.

MNS5102 BUSINESS INNOVATION

Discuss the nature and dynamics of innovation, the contextual influences that affect it, and the strategies and practices for managing it in organizations. This through the reading and discussion of cases, academic texts and the development of group dynamics; in order to manage innovation to influence organizational performance and competitiveness.

MNS5112 OPERATIONS STRATEGY

Develop an understanding of the strategic impact of the operational decisions and trade-offs inherent in these choices, by introducing the basic components of an operational strategy including process technology, capacity and, planning and control systems, to improve the competitiveness of companies.

MASTER IN MANUFACTURING ADMINISTRATION

MNS5012 STATISTICS AND DECISION ANALYSIS

Analyze the quantitative tools of probability, statistics, linear programming and econometrics, through the use of specialized statistical software tools, to solve problems of specific business situations.

MAM5012 PRODUCTION PLANNING AND CONTROL

Develop a production master plan that includes industrial operations, through inventory management based on forecasts, market studies and viability, in order to design, manage and schedule production.

MNS5032 FINANCIAL MANAGEMENT

Analyze and interpret financial information, through the use and application of the main concepts of financial mathematics, to understand and apply the main financial accounting concepts, in business decision-making.

MAM5022 MODELING LOGISTICS OPERATIONS

Explain the main mathematical programming models related to the design of distribution networks and the problems associated with their distribution routes, through the use of specialized software, for the solution of optimization problems related to logistics operations.

MNS5092 STRATEGIC MANAGEMENT PLANNING

Describe models and techniques of planning and strategic direction, through the exposition of concepts, the analysis of theories and the discussion of cases, in order to: 1) diagnose the problems of an organization and formulate a plan to solve it in the short and long term, 2) identify new business opportunities; and 3) apply and develop the main conceptual, methodological and technological tools for strategy in an organization.

MAM5032 PRODUCTION SYSTEMS SIMULATION

Compare theories and methods of validation of manufacturing systems, by creating simulation models using specialized software, to generate alternatives that improve the performance of manufacturing systems.

MAM5042 LEAN SYSTEMS IN MANUFACTURING MANAGEMENT

Distinguish the basic elements of the implementation of Lean Systems and the factors that can influence their efficiency, through models and methodologies of lean thinking, for the use and efficient management of resources.

MAM5052 LEAN SIX SIGMA

Apply improvement projects with Lean Six Sigma, using the cycle: define, measure, analyze, improve, control (DMAMC) to reduce some type of waste.

MNS5122 SELECT TOPICS

Discuss concepts of entrepreneurship, human resources, operations, technology, finance or marketing current and/or complementary to the curriculum, through the presentation of theories, models, case solutions and group discussions, to complement the training of the student.

MNS5132 ADVANCED SELECT TOPICS

Discuss current business concepts and/or complementary to the curriculum, through the presentation of theories, models, case solutions and group discussions, to complement the student's training.

MNS5142 LEADERSHIP AND TALENT MANAGEMENT

Describe current theories about leadership and talent management, through the analysis of different leadership styles and current theories in talent management, to design and implement the processes of attracting, developing and retaining talent in an organization from a strategic perspective.

REP5012 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession,

through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MNS5152 FINAL PROJECT

Discuss methodologies of selection, development and solution of case studies and business projects, through the presentation of theories, methodologies and review of proposals to develop academic documentation of concrete business application, particularly in the area of business administration.

MASTER IN BUSINESS ADMINISTRATION

MNE5102 SELECT TOPICS

Recognize in depth the most appropriate leadership styles according to the type of organization and the importance of the leadership function within the company, through the analysis of business cases, to recognize the main attributions in companies within the international context.

MNE5112 ADVANCED SELECT TOPICS

Plan projects with an international or global scope through the identification and analysis of the various contextual factors that affect the behavior of the multinational team to generate the necessary processes and achieve an effective and efficient management of the same.

MNE5122 CORPORATE MANAGEMENT AND STRATEGY

Formulate strategic actions to guide business decisions towards the achievement of their objectives; through the use of tools for the analysis of the external environment of a company and its competitive position. Develop and implement organizational structures and systems for evaluating strategic actions for the achievement of business objectives, through business case solutions.

REP5022 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MNE5132 FINAL PROJECT

Prepare an academic document of concrete business application to integrate the concepts and tools relevant to decision-making in business through the elaboration of a case study, a specific business application project or a real business problem and its solution.

PROJECT MANAGEMENT

MNE5012 QUANTITATIVE METHODS FOR DECISION-MAKING

Identify and analyze the theoretical foundations of probability and statistical theory applicable to the solution of specific business situations, through the use of quantitative methods to manage and solve specific problems using software.

MNE5022 HUMAN CAPITAL MANAGEMENT

Apply the processes of selection, recruitment and hiring to incorporate workers into an organization, as well as their development and training, the forms of separation and motivation of human beings within the work, by preparing human capital management strategies to attract and retain talent.

MFD5012 FINANCIAL ANALYSIS

Apply the main accounting and mathematical financial concepts, through the analysis and interpretation of necessary financial information, for business decision-making.

MNE5032 BUSINESS ECONOMICS

Apply the tools of Economic analysis to solve the problems faced by companies in their decisions by applying knowledge about supply and demand with market behavior, their inputs and their products. Recognize the interrelationship of production and costs in the decision-making of the company, the different market structures and their characteristics to establish the different alternative strategies that will determine the performance of your company through the economic analysis of the different internal and external factors that affect the performance of the company.

MNE5042 PROJECT MANAGEMENT AND CONTROL

Apply the control and management aspects of a project in the context of its area of specialty and/or work, through the use of management and control tools for the solution of business problems.

MFD5032 CORPORATE FINANCE

Apply the main tools of the three corporate finance objectives: operation, financing and investment, through the management of working capital, the calculation of the cost of capital, the definition of optimal capital structure and investment criteria in mergers and acquisition decisions for the solution of business problems. Analyze and evaluate the financial management criteria related to periods of crisis, compliance with codes of best business practices (national and international) and the importance of shaping corporate governance, through the study and resolution of specific application problems with real data for business decision-making.

MNE5052 PROJECT QUALITY MANAGEMENT

Apply the concepts related to quality management in the projects of the executing organization, through the analysis of specialized methodologies that determine the policies, objectives and responsibilities related to quality, so that the project meets the needs for which it was undertaken.

MNE5062 RISK ANALYSIS IN PROJECTS

Recognize and apply the methods and techniques for evaluating and managing investment projects under conditions of risk and uncertainty, through 1) decision-making under conditions of uncertainty in investment projects, 2) decision-making under risk conditions in investment projects and 3) recognizing concepts, techniques and tools of Monte Carlo simulation, in order to understand and exercise decision-making under risk conditions in the selection and administration of investment projects.

INTERNATIONAL STRATEGY

MNE5012 QUANTITATIVE METHODS FOR DECISION-MAKING

Identify and analyze the theoretical foundations of probability and statistical theory applicable to the solution of specific business situations, through the use of quantitative methods to manage and solve specific problems using software.

MNE5022 HUMAN CAPITAL MANAGEMENT

Apply the processes of selection, recruitment and hiring to incorporate workers into an organization, as well as their development and training, the forms of separation and motivation of human beings within work, by preparing human capital management strategies to attract and retain talent.

MFD5012 FINANCIAL ANALYSIS

Apply the main accounting and mathematical financial concepts, through the analysis and interpretation of necessary financial information, for business decision-making.

MNE5032 BUSINESS ECONOMICS

Apply the tools of Economic analysis to solve the problems faced by companies in their decisions by applying knowledge about supply and demand with market behavior, their inputs and their products. Recognize the interrelationship of production and costs in the decision-making of the company, the different market structures and their characteristics to establish the different alternative strategies that will determine the performance of your company through the economic analysis of the different internal and external factors that affect the performance of the company.

MNE5072 ORGANIZATIONAL ARCHITECTURE OF MULTINATIONAL COMPANIES

Recognize the problems of the organizational architecture of multinational corporations through the application of the concepts, theoretical principles and relevant design guides of the organizational architecture of companies, to analyze problems of profession and propose informed solutions.

MFD5032 CORPORATE FINANCE

Apply the main tools of the three corporate finance objectives: operation, financing and investment, through the management of working capital, the calculation of the cost of capital, the definition of optimal capital structure and investment criteria in mergers and acquisition decisions for the solution of business problems. Analyze and evaluate the financial management criteria related to periods of crisis, compliance with codes of best business practices (national and international) and the importance of shaping corporate governance, through the study and resolution of specific application problems with real data for business decision-making.

MNE5082 INTERNATIONAL OPERATIONS STRATEGY

Evaluate the main tools of global Strategic Management and the difference between business strategy, corporate strategy, global and multinational industries, through the analysis of cases and the successful strategies implemented by these industries in order to propose solutions to the problems that arise in international operations.

MNE5092 INTERNATIONAL BUSINESS ADMINISTRATION

Identify international trade treaties; the regulation of exports and imports into Mexico; the main criteria and mechanisms of regulation of international trade from the Mexican perspective and its main potential effects, through the decision-making of export and import of companies for the solution of business problems.

MASTER IN HEALTH SERVICES ADMINISTRATION

MSA5012 QUALITY IN HEALTH SERVICE

Analyze the principles, tools and methods of quality in medical care and patient safety, through the formulation of management projects to improve efficiency in the provision of services and patient safety.

MNE5022 HUMAN CAPITAL MANAGEMENT

Apply the processes of selection, recruitment and hiring to incorporate workers into an organization, as well as their development and training, the forms of separation and motivation of human beings within the workplace, by preparing human capital management strategies to attract and retain talent.

MFD5012 FINANCIAL ANALYSIS

Apply the main accounting and mathematical financial concepts, through the analysis and interpretation of necessary financial information, for business decision-making.

MSA5022 HEALTH ECONOMICS

Identify the basic elements and processes of the health economy for public policy decision-making in the Mexican health system, through the characterization of the market in this sector and its financing schemes.

MMK5012 STRATEGIC MARKETING

Analyze the decisions of the marketing management designing the value proposition of the company's products and services, for the development of strategies that allow the positioning of the organization and the achievement of its objectives.

MNE5042 PROJECT MANAGEMENT AND CONTROL

Apply the control and management aspects of a project in the context of its area of specialty and/or work, through the use of management and control tools for the solution of business problems.

MSA5032 HOSPITAL MANAGEMENT

Identify the theories and structures of hospital administration, through the description of the stages of the administrative process of health services to manage strategic projects that benefit public or private institutions.

MSA5042 SERVICE MANAGEMENT

Determine the needs of clients or companies in terms of health services, through the use of marketing strategies to design services that meet expectations and achieve competitive advantages in health units.

MSA5052 SELECT TOPICS

Analyze current issues related to epidemiological health services within the administrative context, through the study of latent problems in the world to intervene in the operation and development of health systems at national and international level.

MSA5062 ADVANCED SELECT TOPICS

Develop strategies in the administration of cutting-edge health services, through the description of health care systems to design viable solutions that respond efficiently and effectively to the needs of public and private health institutions.

MNE5122 CORPORATE MANAGEMENT AND STRATEGY

Formulate strategic actions to guide business decisions towards the achievement of their objectives; through the use of tools for the analysis of the external environment of a company and its competitive position. Develop and implement organizational structures and systems for evaluating strategic actions for the achievement of business objectives, through business case solutions.

REP5022 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MSA5072 FINAL PROJECT

Develop a project for the management/administration of health services, using hospital project management tools and programming methods, to develop a specific project for application in health institutions.

MASTER IN INFORMATION TECHNOLOGY ADMINISTRATION

MNE5012 QUANTITATIVE METHODS FOR DECISION-MAKING

Identify and analyze the theoretical foundations of probability and statistical theory applicable to the solution of specific business situations, by using quantitative methods to manage and solve specific problems using software

MIT5012 STRATEGIC INFORMATION TECHNOLOGY MANAGEMENT

Identify the complex relationships between the use of technologies and systems; through the analysis of Practices and standards in information technologies, to generate competitive advantage and solve problems within organizations.

MFD5012 FINANCIAL ANALYSIS

Apply the main accounting and mathematical financial concepts, through the analysis and interpretation of necessary financial information, for business decision-making.

MIT5022 INFORMATION TECHNOLOGY INFRASTRUCTURE

Analyze the scope and limitations of different technology alternatives as well as the security implications of data, service levels and trade-offs that support enterprise architectures, through the design and

selection of institutional computing infrastructures (servers) and personnel, networks and cloud computing to meet the needs of an organization.

MNE5042 PROJECT MANAGEMENT AND MONITORING

Apply the control and management aspects of a project in the context of its area of specialty and/or work, through the use of management and control tools for the solution of business problems.

MIT5032 COMPUTER SECURITY

Distinguish computer security problems and their implications in the administration of computer and information systems, through the application of strategies, data protection techniques and security policies, to ensure the integrity of information in organizations.

MIT5042 PROGRAMMING, DATA AND DECISIONS

Apply the basic concepts of database by using the main functions of the systems administrators of the same and the design techniques, for the development of applications that facilitate decision making.

MIT5052 SYSTEMS ANALYSIS, MODELING AND DESIGN

Plan the information management requirements of organizations, through the design and implementation of management systems and processing of data and information of organizations for the solution of problems related to the management of information in business.

MIT5062 SELECT TOPICS

Delve into current issues of information technology management, through the analysis of the main problems in the computer field, to respond appropriately to the needs of organizations in both the public and private sectors.

MIT5072 ADVANCED SELECT TOPICS

Develop strategies in the management of information technologies according to the needs of organizations, through the integration and use of tools and computer systems, to solve detected technology problems and add value to organizations.

MNE5122 CORPORATE MANAGEMENT AND STRATEGY

Formulate strategic actions to guide business decisions towards the achievement of their objectives; through the use of tools for the analysis of the external environment of a company and its competitive position. Develop and implement organizational structures and systems for evaluating strategic actions for the achievement of business objectives, through business case solutions.

REP5022 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MIT5082 FINAL PROJECT

Develop a project or analyze a real case in the area of information technologies through the integration of applicable concepts and tools for decision-making and the proposal of relevant solutions.

MASTER IN ENERGY MANAGEMENT

MDR5072 ENERGY FINANCE

Use the techniques and models of Financial analysis most used in the field of energy generation, transmission and distribution, through the examination of financial models focused on the sector, to apply them in the accounting of the industry in energy matters.

MDR5082 SELECT TOPICS

Analyze current issues in the areas of management in the energy field, through the application of techniques and management tools, to plan strategies to promote projects effectively.

MNE5122 CORPORATE MANAGEMENT AND STRATEGY

Formulate strategic actions to guide business decisions towards the achievement of their objectives; through the use of tools for the analysis of the external environment of a company and its competitive position. Develop and implement organizational structures and systems for evaluating strategic actions for the achievement of business objectives, through business case solutions.

REP5022 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MDR5092 FINAL PROJECT

Argue a case of business success or failure following a methodology of selection, development and solution of case studies, through business models, implementing continuous simulation techniques in the solution of problems, to develop academic documentation of concrete business application, particularly in the area of business in energy matters.

ENERGY PROJECT MANAGEMENT

MFD5012 FINANCIAL ANALYSIS

Apply the main accounting and mathematical financial concepts, through the analysis and interpretation of necessary financial information, for business decision-making.

MDG5022 ORGANIC STRUCTURE IN ENERGY

Differentiate the structure of the entities involved in the administration and management of energy, by reviewing the powers of the regulatory bodies and their scope, in order to contrast the various activities contemplated in the laws of the energy sector.

MDR5012 INTERNATIONAL ENERGY MARKETS

Identify the factors that promote the use of energy sources such as coal, oil and natural gas, based on the influence they have directly on the levels of price, consumption and production of hydrocarbons to avoid the fall and decline of the economies of countries.

MNE5042 PROJECT MANAGEMENT AND CONTROL

Apply the control and management aspects of a project in the context of its area of specialty and/or work, through the use of management and control tools for the solution of business problems.

MDR5022 RENEWABLE ENERGY

Identify solar thermal energy schemes, through the selection of sustainable components, solar collectors and mathematical calculations that improve profitability studies, for the installation and maintenance of the solar thermal and photovoltaic system.

MDR5032 FUEL ENERGY

Use the fundamentals of the construction and design of fuel generation systems, through the application of design engineering of key biofuel production plants and processes, to develop biodiesel refining projects as well as the liquefaction and saccharification of bioethanol.

MNE5052 PROJECT QUALITY MANAGEMENT

Apply the concepts related to quality management in the projects of the executing organization, through the analysis of specialized methodologies that determine the policies, objectives and responsibilities related to quality, so that the project meets the needs for which it was undertaken.

MNE5062 PROJECTS RISK ANALYSIS

Recognize and apply the methods and techniques for evaluating and managing investment projects under conditions of risk and uncertainty, through 1) decision-making under conditions of uncertainty in investment projects, 2) decision-making under risk conditions in investment projects and 3) recognizing concepts, techniques and tools of Monte Carlo simulation, to understand and exercise decision-making under risk conditions in the selection and administration of investment projects.

SUSTAINABLE TECHNOLOGIES AND ENERGY

MFD5012 FINANCIAL ANALYSIS

Apply the main accounting and mathematical financial concepts, through the analysis and interpretation of necessary financial information, for business decision-making.

MDR5042 ECOLOGY AND CLIMATE CHANGE

Apply the basic knowledge of the process of interaction of organisms with their environment, through the distinction of the factors of global change in terrestrial and marine ecosystems, those found mainly in Mexico, in order to identify the functioning of the current world and the great environmental challenges facing humanity.

MDR5052 ENVIRONMENTAL CHANGE FACTORS

Identify the current impact and interdisciplinary scientific principles related to environmental change, by assessing the effects according to the vulnerability suffered by different ecosystems, for the planning of sustainable strategies that mitigate environmental change.

MNE5042 PROJECT MANAGEMENT AND CONTROL

Apply the control and management aspects of a project in the context of its area of specialty and/or work, through the use of management and control tools for the solution of business problems.

MDR5022 RENEWABLE ENERGY

Identify solar thermal energy schemes, through the selection of sustainable components, solar collectors and mathematical calculations that improve profitability studies, for the installation and maintenance of the solar thermal and photovoltaic system.

MDR5032 FUEL ENERGY

Use the fundamentals of the construction and design of fuel generation systems, through the application of design engineering of key biofuel production plants and processes, to develop biodiesel refining projects as well as the liquefaction and saccharification of bioethanol.

MDR5062 THERMAL COMFORT AND ENERGY EFFICIENCY

Evaluate the aspects of thermal performance, through the identification of standards, norms and design recommendations that allow the use of thermal components and complementary construction techniques in order to improve the energy efficiency of buildings.

MNE5052 PROJECT QUALITY MANAGEMENT

Apply the concepts related to quality management in the projects of the executing organization, through the analysis of specialized methodologies that determine the policies, objectives and responsibilities related to quality, so that the project meets the needs for which it was undertaken.

MASTER IN COMMUNICATION AND DIGITAL MEDIA

MCM5012 COMMUNICATION AND CULTURAL PROCESSES

Identify the main approaches from which the processes of communication and the media have been studied, through the analysis of the relationship and intervention in the processes and cultural practices of individuals and societies to implement strategies in the areas of opportunity.

MCM5022 TRANSMEDIA CONTENT

Identify the key concepts to which the transmedia phenomenon refers, through the detailed analysis of how the entertainment industry functions in order to distinguish the areas of opportunity in the development of new content.

MCM5032 LANGUAGE AND STORYTELLING IN DIGITAL MEDIA
Identify the ontology of digital narrative based on its characteristics, concepts, designs and essential principles of language, by using contemporary digital media to apply strategies in new digital paradigms.

MCM5042 WEB COMMUNICATION STRATEGIES
Create strategies that help organizations and companies communicate their messages, whether it's in a commercial, governmental or social sphere, through the main standards of content production for the Web, their languages and implementation for the development of pages, applications or simply to distribute or share Web elements.

MNS5092 STRATEGIC PLANNING AND MANAGMENT
Describe models and techniques of planning and strategic direction, through the exposition of concepts, the analysis of theories and the discussion of cases, in order to: 1) diagnose the problems of an organization and formulate a plan to solve them in the short and long term, 2) identify new business opportunities; and 3) apply and develop the main conceptual, methodological and technological tools for strategy within an organization.

MPD5042 SOCIAL MEDIA MARKETING
Describe the concept of social media marketing, through the study of new communication strategies, promotion and interaction of social networks and other interactive media on the Internet, so that the student obtains an overview of the corporate positioning of goods and services.

MCM5052 COMMUNICATION STRATEGIES FOR MOBILE DEVICES
Identify the importance of mobile technology, through the development of technological communication strategies for the solution of the needs of a public, private or community organization.

MCM5062 COMMUNICATION AND DIGITAL GLOBALIZATION
Explain the conceptual framework of the processes of digital globalization in the media, by identifying the political, economic and social contexts in which digital globalization has an impact to apply the principles and tools that are necessary in communication projects at local, regional and global levels.

MCM5072 SELECT TOPICS
Make various types of interactive electronic publications through the use of current production tools, for the solution of needs of a public or private organization.

MCM5082 ADVANCED SELECT TOPICS
Select cutting-edge tools and applications through data collection, analysis and interpretation, in order to use this information to make strategic decisions in the use of digital media and promote products, services or messages effectively and efficiently.

MCM5092 INTERFACE USABILITY FOR DIGITAL MEDIA
Apply theoretical, practical and methodological knowledge in the usability related to the interactivity of digital media, through the development of interfaces of interactive and multimedia resources to develop digital projects that are efficient and operational based on their digital contents.

REP5012 CORPORATE AND PROFESSIONAL RESPONSIBILITY
Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially

responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MCM5102 FINAL PROJECT

Develop an integrative project that involves the documentation process, by linking knowledge related to digital media and communication strategies in order to propose solutions to real problems or develop new proposals.

MASTER IN BUSINESS LAW

MEM5162 SELECT TOPICS

Delve into specific current and relevant issues of Business Law, through the analysis of the current legal problems facing the sector, in order to respond to the needs of regulation in the corporate field in Mexico and in the world.

MEM5172 ADVANCED SELECT TOPICS

Develop strategies and propose viable solutions in the field of Business Law, through the application of principles, theories, legal models, electronic mechanisms, legal figures, agreements and applicable international treaties, to respond effectively to the current needs of the company in the defense of its rights and interests.

MEM5182 LEGAL ARGUMENTATION

Propose viable solutions to situations and legal conflicts, through the critical and axiological reasoning of the problem, to obtain through solid elements the protection of the legal norm.

REP5022 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MEM5192 FINAL PROJECT

Design improvement projects in the short and medium term, through a technical and financial viability analysis, in order to perform their professional functions in a specialized, practical and effective way.

FISCAL STRATEGY OPTION

MEM5092 PRINCIPLES OF TAX RIGHTS

Distinguish the foundations, mechanics, structure and inherent regulations of the current constitutional and fiscal system, through the applicable tax doctrines and principles, for the identification of errors and violations in the establishment of taxes by the State.

MEM5102 PERSONAL INCOME TAX

Distinguish the operations and inscriptions in the various taxes that occupy the natural persons and identify the tax obligations that correspond to them, through the analysis of various cases, to plan the correct strategies that allow the economic and legal efficiency of the performance of the activities inherent to the person.

MFD5012 FINANCIAL ANALYSIS

Apply the main accounting and mathematical financial concepts, through the analysis and interpretation of necessary financial information, for business decision-making.

MEM5112 TAX PROCEDURES

Operate the litigious resources, through the application of the means of defense provided for by Mexican tax legislation, respecting procedural loyalty, good faith and without losing sight of the axiological elements of the Profession, in order to challenge all resolutions or administrative and/or jurisdictional processes determined by the tax authority.

MEM5122 INCOME TAX OF LEGAL ENTITIES

Analyze the various regimes in which legal entities operate and the differences in the taxation of each of them, through the study of Mexican legislation, to propose the work schemes in tax matters adapted to the purposes and functions of each of them.

MEM5132 CONSUMPTION TAX

Carry out all the operations and processes related to the taxes that tax the consumption of goods and services, by evaluating the impact that these taxes have on the activity of the obliged subjects, to design the correct tax strategies for their payment and settlement.

MEM5142 MEANS OF DEFENSE IN TAX MATTERS

Analyze the fundamental concepts about the procedures in fiscal and administrative matters, the acts of authority and the existing means of defense, from the study of the fiscal legislation and the jurisprudence in tax matters, to obtain the nullity by the illegality of an administrative resolution issued by the authority in fiscal matters.

MEM5152 NON-PROFIT INCOME TAX ON LEGAL ENTITIES

Determine the normative provisions, through a doctrinal and jurisprudential study issued by the courts, for the due payment of taxes in the case of legal persons that do not pursue profit motives, such as foundations, societies or civil associations.

RIGHT OPTION OF INTERNATIONAL BUSINESS

MEM5012 PRIVATE INTERNATIONAL LAW

Detect conflicts and legal situations arising from legal facts and acts in the global environment, through the analysis of internal rules and international conventions that regulate them, as well as the importance of international procedural cooperation, to solve legal situations arising from international relations between individuals.

MEM5022 CUSTOMS AND FOREIGN TRADE LAW

Use the necessary operations within the customs regimes to carry out foreign trade operations, through the comprehensive analysis of the customs law and foreign trade, as well as the correlated laws and the various international treaties in the matter, to develop the foreign trade activities of the companies.

MEM5032 AGREEMENTS ON TAX DEFENSE MEASURES

Detect the measures that states can apply as commercial defense, through the study and analysis of national and international legal provisions that regulate this type of measures, to propose strategies to follow and solve specific problems.

MEM5042 INTELLECTUAL PROPERTY RIGHT AND FOREIGN INVESTMENT

To differentiate in a concrete way the contents of intellectual property in the national and international order, through the application of international treaties and the development of strategies aimed at the protection and exploitation of its various formats, for the resolution of conflicts in the regulatory field and foreign investment in Mexico.

MEM5052 INTERNATIONAL TRADE REGULATION OF GOODS AND SERVICES

Master the international regulations that regulate the trade of goods and services, through the analysis of the international treaties that establish the guidelines to be followed in the legal order, to solve international conflicts between States and between individuals in commercial matters.

MEM5062 INTERNATIONAL COMMERCIAL CONTRACTS

Correctly use the operations of purchase sale of goods and services, through the analysis of the rules that regulate international contracting, to have the necessary elements in international commercial operations of a private nature.

MEM5072 SETTLEMENT OF DISPUTES IN THE INTERNATIONAL COMMERCIAL FIELD

Conduct in an assertive way the negotiation and resolution of conflicts, through the knowledge of the treaties that design various mechanisms of dispute resolution depending on the subjects involved and the nature of the disputes, to resolve conflicts definitively with full legal effect.

MTM5082 INTERNATIONAL TRADE TREATIES

Use with skill the content of the international trade instruments signed by Mexico, through the analysis of the treaties and provisions that regulate world trade, to resolve disputes arising from the interpretation of the rights and obligations of the countries that are parties to such trade agreements.

MASTER IN ENERGY LAW

MDG5012 LEGAL FRAMEWORK IN ENERGY GENERATION

Identify the laws governing the matter of oil energy and electricity, through the study of the essential elements of each of the legal provisions, for application in the context of administration.

MDG5022 ORGANIC ENERGY STRUCTURE

Differentiate the structure of the entities involved in the administration and management of energy, by reviewing the powers of the regulatory bodies and their scope, in order to contrast the various activities contemplated in the laws of the energy sector.

MDG5032 HYDROCARBONS LEGAL SYSTEM

Distinguish the contents of the regulation of hydrocarbons, through the description of the various activities permitted in the Constitution and the applicable laws, in order to implement advisory strategies in the public and private sectors.

MEM5052 INTERNATIONAL TRADE REGULATION OF GOODS AND SERVICES

Master the international regulations that regulate the trade of goods and services, through the analysis of the international treaties that establish the guidelines to be followed in the legal order, to solve international conflicts between States and between individuals in commercial matters.

MDG5042 EXPLORATION AND EXTRACTION PROCUREMENT PROCEDURE

Distinguish the procedures of extraction and exploration of hydrocarbons, through the normative interpretation of the new regulation of the Hydrocarbons Law applicable in the international framework to advise companies in the authorization, concession and bidding.

MEM5062 INTERNATIONAL COMMERCIAL CONTRACTS

Correctly use the operations of purchase sale of goods and services, through the analysis of the rules that regulate international contracting, to have the necessary elements in international commercial operations of a private nature.

MDR5072 ENERGY FINANCE

Use the techniques and models of Financial analysis mostly used in the field of energy generation, transmission and distribution, through the examination of financial models focused on the sector, to apply them in the accounting of the industry in energy matters.

MEM5072 SETTLEMENT OF DISPUTES IN THE INTERNATIONAL COMMERCIAL FIELD

Conduct in an assertive way the negotiation and resolution of conflicts, through the knowledge of the treaties that design various mechanisms of dispute resolution depending on the subjects involved and the nature of the disputes, in order to resolve conflicts definitively with full legal effect.

MDG5052 SELECT TOPICS

To examine current issues of relevance on energy law, through the systematic description of the legal phenomena related to the regulation of the sector in Mexico and abroad, both in public and private spheres, in accordance with current national and international regulations, in order to provide solutions to the problems raised in the field of hydrocarbon energy.

MDG5062 ADVANCED SELECT TOPICS

Apply solutions to the current problem of substantive and adjective law in energy matters, through the development of legal strategies on the systematic normative, jurisprudential, theoretical and doctrinal analysis of the legal relations between the public sector and private initiative, to identify areas of opportunity relevant in the development of exploration activities, energy exploitation and marketing.

MDG5072 TRADE ARBITRATION

Create initiatives for the processing of the various stages of the arbitral procedure within the framework of the culture of legality and promotion of the culture of peace, through the use of alternative means to the jurisdictional ones, in order to propose solutions to disputes, maintaining the personal and commercial relations of those involved.

REP5022 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MDG5082 FINAL PROJECT

Develop an integrative project in which the disciplines, theories, principles, doctrines and laws in energy matters are analyzed, through the execution of methodological tools for the resolution of a problem or presentation of a case study.

MASTER IN TAX LAW

MDS5012 PRINCIPLES OF TAX LAW

Broadly apply the foundations, mechanics, structure and inherent regulations of the current constitutional and fiscal system, through the applicable tax doctrines and principles, for the identification of errors and violations in the establishment of taxes by the State.

MDS5022 PERSONAL INCOME TAX

Distinguish the operations and inscriptions in the various taxes that occupy the natural person and identify the tax obligations that correspond to them, through the analysis of various cases, in order to plan the correct strategies that allow the economic and legal efficiency of the performance of the activities inherent to the natural person.

MDS5032 CONSUMPTION TAX

Carry out all the operations and processes related to the taxes that tax the consumption of goods and services, by evaluating the impact that these taxes have on the activity of the obliged subjects, to design the correct tax strategies for their payment and settlement.

MDS5042 INCOME TAX OF LEGAL ENTITIES

Compare the various regimes in which legal entities operate and the differences in the taxation of each of them, through the analysis of the applicable tax legislation, to propose the work schemes in tax matters according to the purposes and functions of each of them.

MDS5052 INTERNATIONAL TREATIES ON TAX MATTERS

Analyze the different treaties and agreements in tax matters concluded by Mexico aimed at avoiding multiple taxation, through the detailed analysis of the different taxable income derived from interest, royalties and dividends, in order to make the most of the advantages granted in these treaties.

MDS5062 TAX INVESTIGATION AND VERIFICATION

Operate the litigious resources, through the application of the means of defense provided for by Mexican tax legislation, respecting procedural loyalty, good faith and without losing sight of the axiological elements of the Profession, in order to challenge all resolutions or administrative and/or jurisdictional processes determined by the tax authority.

MDS5072 MEANS OF DEFENSE IN TAX MATTERS

Analyze the fundamental concepts about the procedures in fiscal and administrative matters, the acts of authority and the existing means of defense, from the study of the fiscal legislation and the jurisprudence in tax matters, to obtain the nullity by the illegality of an administrative resolution issued by the authority in fiscal matters.

MNS5032 FINANCIAL MANAGEMENT

Analyze and interpret financial information, through the use and application of the main concepts of financial mathematics, to understand and apply the main financial accounting concepts, in business decision-making.

MDS5082 SELECT TOPICS

Deepen in specific current and relevant issues of Tax Law, through the analysis of latent problems in Mexico and in the world, in accordance with the applicable national and international legislation, to respond adequately to the needs in the public and private sector in tax matters.

MDS5092 ADVANCED SELECT TOPICS

Develop strategies and propose viable solutions on problems in tax matters, through the analysis of cases applicable to natural and legal persons, to delve into current specialized issues of tax matters.

MDS5102 CUSTOMS LAW AND FOREIGN TRADE

Apply the necessary operations within the customs regimes to carry out foreign trade activities, through the comprehensive analysis of the customs law, as well as the correlated laws and the various international treaties in the matter, to develop the transnational activities of the companies.

REP5012 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MDS5112 FINAL PROJECT

Develop improvement projects in Tax Law, through the joint and interdisciplinary integration of the knowledge and skills acquired during the development of the master's degree, in order to propose solutions and improvements that favor the assets of taxpayers.

MASTER IN INFORMATION DESIGN

MPD5012 EDITORIAL DESIGN AS VISUAL JOURNALISM

Identify the existing opportunities in the publishing market, through the analysis of its engineering and interaction with consumers, to propose an editorial project that is recognized not only as a layout process but as visual journalism.

MPD5022 INFORMATION DESIGN AND SOCIETY

Define the purposes of information design, through the analysis of the theories of the discipline and its scope, for the innovation of creative projects in a social context.

MCM5032 LANGUAGE AND STORYTELLING IN DIGITAL MEDIA

Identify the ontology of a digital narrative based on its characteristics, concepts, designs and essential principles of language, by using contemporary digital media in order to apply strategies in new digital paradigms.

MPD5032 PUBLISHING TECHNOLOGY

Design an editorial product identifying the technological tools, through the analysis of the contents and their audiences, for the creation of editorial pieces aimed at a specific audience.

MNS5092 STRATEGIC PLANNING AND MANAGEMENT

Describe models and techniques of planning and strategic direction, through the exposition of concepts, the analysis of theories and the discussion of cases, in order to: 1) diagnose the problems of an organization and formulate a plan to solve them in the short and long term, 2) identify new business opportunities; and 3) apply and develop the main conceptual, methodological and technological tools for strategy in an organization.

MPD5042 SOCIAL MEDIA MARKETING

Describe the concept of social media marketing, through the study of new communication strategies, promotion and interaction of social networks and other interactive media on the Internet, so that the student obtains an overview of the corporate positioning of goods and services.

MPD5052 PHOTO MANAGEMENT AND EDITING

Apply the basic principles of photography in the field of editorial design, through the elaboration of proposals based on the theories of a panorama centered on the optics of the editor or photojournalist to make critical contributions on photojournalism.

MPD5062 EDITORIAL PLANNING AND ENGINEERING

Design editorial pieces, through the construction guidelines of editorial engineering, for later implementation in the development of publications.

MPD5072 SELECT TOPICS

Review the current trends in the development of information design both in the editorial area and in emerging areas, through the analysis of different bibliographic sources and case studies, to determine the trends of these professional fields.

MPD5082 ADVANCED SELECT THEMES

Apply theoretical and critical tools in the evaluation of information design projects, through the discussion of the results of a diagnosis with practical, technical and discursive resources of professional level, to keep up to date on the evaluative trends and Practices in your professional area.

MPD5092 DESIGN PROJECT MANAGEMENT

Identify techniques and tools on diagnostics and strategic planning, through the application of innovative methodologies, in order to describe the constants and variables in information problems within the analysis of the design management process.

REP5012 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MPD5102 FINAL PROJECT

Develop an integrative project, by identifying problems that require design solutions, to generate a diagnostic proposal that allows strategic decisions to be made.

MASTER IN BASIC EDUCATION

MEB5012 EDUCATIONAL TECHNOLOGY

At the end of the course, the student will be able to transform their teaching practice and/or management through the appropriate use of Information and Communications Technologies (ICT) in order to favorably impact the teaching and learning processes, as well as their teaching and/or directive professionalization.

MEB5252 PROFESSIONAL COMPETENCES IN EDUCATION

At the end of the subject the student will address the teaching and directive competences, starting from a reflective analysis of their own practice, assessment of their own knowledge and willingness to continue their training and the management of strategies that allow them to continuously improve.

MEB5042 PROFESSIONAL DEVELOPMENT AND RESPONSIBILITY OF EDUCATIONAL PRACTICE

At the end of the course, the student will be able to recognize himself within the framework of ethics and responsibility as a teacher or manager in order to favor and develop his commitment in his professional practice.

MEB5132 EDUCATION LEGISLATION

At the end of the course, the student will be able to recognize the legislative trends of education in Latin America, understand the educational reforms recently carried out in Mexico and the philosophical, legal and administrative bases of contemporary education to apply them in managerial and teaching practice.

EMPHASIS ON TEACHING PEDAGOGICAL SKILLS

MEB5082 EDUCATIONAL QUALITY IN BASIC EDUCATION

The student will be able to perform a critical-reflective analysis of the concept of educational quality, of the sciences associated with education, of its link and sustenance in educational theories, as well as its impact on educational practice.

MEB5092 INCLUSIVE BASIC EDUCATION AND DIVERSITY IN THE CLASSROOM

At the end of the course the student will have a reflective and critical vision of theory and practice, in the field of Inclusive Education and attention to diversity and will be recognized as a leader of them.

MEB5072 TEACHING AND LEARNING STRATEGIES IN BASIC EDUCATION

The student will have to choose in an informed way the appropriate strategies to create conditions and situations of teaching and learning that favor the achievement of the educational objectives, planning and controlling their execution, as well as the appropriate selection of resources and techniques.

MEB5022 ANALYSIS OF LEARNING IN BASIC EDUCATION

At the end of the course, the student will be able to analyze the historical, socioeconomic and cultural factors that influence human learning. It will reflect on the relationship that exists between the relevant teaching practices and the achievement of significant learning that seeks the personal transformation of the students and the social environment in which they operate.

MEB5112 EDUCATIONAL EVALUATION IN BASIC EDUCATION

At the end of the course, the student will master in a systematic and informed way the nature of the main concepts on evaluation, their interrelationships with the objectives and teaching processes, as well as their practical importance. It will be able to apply methodologies to solve problems related to the evaluation of learning in the classroom, in an informed and effective way.

MEB5032 DESIGN OF PROJECTS FOR EDUCATIONAL PRACTICE IN BASIC EDUCATION

At the end of the course, the student will be able to create an educational intervention project and establish evaluation criteria for it. The project will be raised in the context of an educational institution of Basic Education, in a process of analysis, planning and reflection in which the student will integrate the learning acquired in the previous subjects.

EMPHASIS ON MANAGEMENT AND DIRECTION OF EDUCATIONAL INSTITUTIONS

MEB5222 STRATEGIC MANAGEMENT FOR QUALITY IN BASIC EDUCATION

At the end of the course, the student will be able to design mechanisms and strategies of educational management aimed at the educational quality of the school organizations, contextualized to that of Basic Education.

MEB5122 TEACHING, LEARNING AND EVALUATION IN BASIC EDUCATION

At the end of the course students will analyze and reflect on the central aspects of an educational institution of basic education: teaching and learning. They will also address in an informed way, the nature and the main concepts about evaluation, their practical importance, as well as their relationship with learning and teaching.

MEB5182 STRATEGIC PLANNING IN BASIC EDUCATION ORGANIZATIONS

The student will be able to recognize strategic planning as a tool to promote transformation processes, identify and develop the competencies and skills of high performance and performance managers to promote processes of change and improvement in schools within the framework of the RIEB. To do this, the student will carry out diagnostic processes, design and supervision of strategic management and improvement plans, to make decisions appropriate to the institutional and social needs of the context.

MEB5192 SCHOOL ORGANIZATION IN BASIC EDUCATION

The student will be able to identify the processes of school organization in the educational institutions of Basic Education, with a reflective and critical vision of theory and practice, analyzing and deepening the different administrative and school management aspects.

MEB5242 EVALUATION AND CONTINUOUS IMPROVEMENT IN BASIC EDUCATION

At the end of the course the student will be able to implement relevant methodologies for decision-making from the application of various evaluation instruments, strategies for monitoring and control related to the process of continuous improvement.

MEB5262 PROJECT DESIGN FOR MANAGEMENT PRACTICE IN BASIC EDUCATION

At the end of the course, the student will be able to create an educational management project and establish evaluation criteria for it. The project will be raised in the context of an educational institution of Basic Education, in a process of analysis, planning and reflection in which the student will integrate the learning acquired in the previous subjects.

MASTER IN UPPER SECONDARY EDUCATION

MEB5012 EDUCATIONAL TECHNOLOGY

At the end of the course, the student will be able to transform their teaching practice and/or management through the appropriate use of Information and Communications Technologies (ICT) to favorably impact the teaching and learning processes, as well as their teaching and/or directive professionalization.

MEB5252 PROFESSIONAL COMPETENCES IN EDUCATION

At the end of the subject the student will address the teaching and directive competences, starting from a reflective analysis of their own practice, an assessment of their own knowledge and willingness to continue their training and the management of strategies that allow them to continuously improve.

MEB5042 PROFESSIONAL DEVELOPMENT AND RESPONSIBILITY OF EDUCATIONAL PRACTICE

At the end of the course, the student will be able to recognize himself within the framework of ethics and responsibility as a teacher or manager to favor and develop his commitment in his professional practice.

MEB5132 EDUCATION LEGISLATION

At the end of the course, the student will be able to recognize the legislative trends of education in Latin America, understand the educational reforms recently carried out in Mexico and the philosophical, legal and administrative bases of contemporary education to apply them in managerial and teaching practice.

EMPHASIS ON TEACHING PEDAGOGICAL SKILLS

MMS5082 EDUCATIONAL QUALITY IN HIGHER SECONDARY EDUCATION

The student will be able to perform a critical-reflective analysis of the concept of educational quality, of the sciences associated with education, of its link and sustenance in educational theories, as well as its impact on educational practice.

MMS5092 INCLUSIVE UPPER SECONDARY EDUCATION AND DIVERSITY IN THE CLASSROOM

At the end of the course the student will have a reflective and critical vision of theory and practice, in the field of Inclusive Education and attention to diversity and will be recognized as a leader of them.

MMS5072 TEACHING AND LEARNING STRATEGIES IN UPPER SECONDARY EDUCATION

The student will be able to choose in an informed way the relevant strategies to create conditions and situations of teaching and learning that favor the achievement of the educational objectives, as well as an adequate selection of resources and planning of the class.

MMS5022 ANALYSIS OF LEARNING IN UPPER SECONDARY EDUCATION

At the end of the course, the student will be able to analyze the historical, socioeconomic and cultural factors that influence human learning. It will reflect on the relationship that exists between the relevant teaching practices and the achievement of significant learning that seeks the personal transformation of the students and the social environment in which they operate.

MMS5112 EDUCATIONAL EVALUATION IN UPPER SECONDARY EDUCATION

At the end of the course the student will master in a systematic and informed way the nature of the main concepts on evaluation, their interrelationships with the objectives and processes of teaching, as well as their practical importance. They will be able to apply methodologies to solve problems related to the evaluation of learning in the classroom, in an informed and effective way.

MMS5032 DESIGN OF PROJECTS FOR THE PRACTICE EDUCATIVA IN UPPER SECONDARY EDUCATION

At the end of the course, the student will be able to create an educational intervention project and establish evaluation criteria for it. The project will be raised in the context of an educational institution of Upper Secondary Education, in a process of analysis, planning and reflection in which the student will integrate the learning acquired in the previous subjects.

EMPHASIS ON MANAGEMENT AND DIRECTION OF EDUCATIONAL INSTITUTIONS

MMS5212 STRATEGIC MANAGEMENT FOR QUALITY IN UPPER SECONDARY EDUCATION

At the end of the course, the student will be able to design mechanisms and strategies of educational management aimed at the educational quality of the school organizations, contextualized to Upper Secondary Education.

MMS5122 TEACHING, LEARNING AND EVALUATION IN UPPER SECONDARY EDUCATION

At the end of the course the students will analyze and reflect on the central aspects of an educational institution of Upper Secondary Education: teaching and learning. They will also address in an informed

way, the nature and the main concepts about evaluation, their practical importance, as well as their relationship with learning and teaching.

MMS5172 STRATEGIC PLANNING IN HIGHER SECONDARY EDUCATION ORGANIZATIONS

The student will be able to recognize strategic planning as a tool to promote transformation processes, identify and develop the competencies and skills of high performance and performance managers to drive processes of change and improvement in schools within the framework of the RIEMS. To do this, the student will carry out diagnostic processes, design and supervise strategic management and improvement plans, in order to make decisions appropriate to the institutional and social needs of the context.

MMS5182 SCHOOL ORGANIZATION IN UPPER SECONDARY EDUCATION

The student will be able to identify the processes of school organization in the institutions of Upper Secondary Education, with a reflective and critical vision of theory and practice, analyzing and deepening the different administrative and school management aspects.

MMS5242 EVALUATION AND CONTINUOUS IMPROVEMENT IN UPPER SECONDARY EDUCATION

At the end of the course the student will be able to implement relevant methodologies for decision-making from the application of various evaluation instruments, strategies for monitoring and control related to the process of continuous improvement.

MMS5262 DESIGN OF PROJECTS FOR DIRECT PRACTICE IN UPPER SECONDARY EDUCATION

At the end of the course, the student will be able to create an educational management project and establish evaluation criteria for it. The project will be raised in the context of an educational institution of Upper Secondary Education, in a process of analysis, planning and reflection in which the student will integrate the learning acquired in the previous subjects.

MASTER IN CORPORATE FINANCE

MNE5012 QUANTITATIVE METHODS FOR DECISION-MAKING

Identify and analyze the theoretical foundations of probability and statistical theory applicable to the solution of specific business situations, through the use of quantitative methods to manage and solve specific problems using software.

MNE5022 HUMAN CAPITAL DIRECTORATE

Apply the processes of selection, recruitment and hiring to incorporate workers into an organization, as well as their development and training, the forms of separation and motivation of human beings within the work, by preparing human capital management strategies to attract and retain talent.

MFD5012 FINANCIAL ANALYSIS

Apply the main accounting and mathematical financial concepts, through the analysis and interpretation of necessary financial information, for business decision-making.

MNE5032 BUSINESS ECONOMICS

Apply the tools of Economic analysis to solve the problems faced by companies in their decisions by applying knowledge about supply and demand with market behavior, their inputs and their products. Recognize the interrelationship of production and costs in the decision-making of the company, the different market structures and their characteristics to establish the different alternative strategies that

will determine the performance of your company through the economic analysis of the different internal and external factors that affect the performance of the company.

MFD5022 INTERNATIONAL FINANCE

Apply international finance tools to maximize the value of a company that markets in more than one country, through the analysis of management decisions for the formulation of business strategies.

MFD5032 CORPORATE FINANCE

Apply the main tools of the three corporate finance objectives: operation, financing and investment, through the management of working capital, the calculation of the cost of capital, the definition of optimal capital structure and investment criteria in mergers and acquisition decisions for the solution of business problems. Also evaluate the criteria of Financial Management related to periods of crisis, compliance with codes of best national and international business practices and the importance of the formation of Corporate Governance, through the study and resolution of specific problems of application with real data for business decision-making.

MFD5042 FINANCIAL CONTROL

Identify the characteristics of financial administrative control systems, which allow to detect deviations and make decisions to correct the course of the organization's goals and achieve the objectives, through the analysis of the environment, strategy, culture and organizational structure, as well as the financing and use of its resources using qualitative and quantitative tools.

MFD5052 CORPORATE LEGAL AND FISCAL FRAMEWORK

Identify the essential and valid elements of the contracts concluded in the business field established by contemporary legal doctrine and by the legal framework applicable to them at the national and international level for the study of alternatives for solving problems favoring the analysis of international commercial arbitration.

MFD5062 SELECT TOPICS

Analyze the selected topics in order to keep the student updated, in the topics related to the various aspects that make up the field of information technology administration, through the solution of practical exercises.

MFD5072 ADVANCED SELECT TOPICS

Delve into current issues of Corporate Finance according to the needs of organizations, through the integration and use of tools and methodologies, to solve detected problems and add value to organizations.

MNE5122 CORPORATE MANAGEMENT AND STRATEGY

Formulate strategic actions to guide business decisions towards the achievement of their objectives; through the use of tools for the analysis of the external environment of a company and its competitive position. Develop and implement organizational structures and systems for evaluating strategic actions for the achievement of business objectives, through business case solutions.

REP5022 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession,

through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MFD5082 FINAL PROJECT

Design an academic document that may be a case study, application project or a real business problem, particularly in the area of corporate finance to integrate the relevant concepts and tools that support decision-making.

MASTER IN CONSTRUCTION PROJECT MANAGEMENT

MGE5012 CONSTRUCTION LEGISLATION

Identify the regulations applicable to the construction area, through the analysis of real cases and the review of documentary and electronic sources, to analyze the legal provisions that affect the development of the construction industry.

MGE5022 CONSTRUCTION RESOURCE EFFICIENCY

Apply the engineering of methods, times and movements to improve productivity in construction projects, through the analysis of processes that consider the use of techniques that allow the measurement of said process.

MNS5032 FINANCIAL MANAGEMENT

Analyze and interpret financial information, through the use and application of the main concepts of financial mathematics, to understand and apply the main financial accounting concepts, in business decision-making.

MGE5032 CONSTRUCTION PLANNING

Apply the most used methods in the planning of works, involving the concept of administration, programming and control of construction projects, to generate a relevant management and control of risk within the projects.

MNS5092 STRATEGIC PLANNING AND DIRECTION

Describe models and techniques of planning and strategic direction, through the exposition of concepts, the analysis of theories and the discussion of cases, in order to: 1) diagnose the problems of an organization and formulate a plan to solve it in the short and long term, 2) identify new business opportunities; and 3) apply and develop the main conceptual, methodological and technological tools for strategy in an organization.

MGE5042 CONSTRUCTION PROJECTS EVALUATION

Propose the evaluation of infrastructure projects through the integration of knowledge, cost analysis and market strategies, as well as civil engineering, to evaluate the viability of projects in the construction industry.

MNS5072 PROJECT RISK MANAGEMENT

Discuss the methods and techniques to evaluate and manage investment projects under conditions of risk and uncertainty, explain the concepts, techniques and tools of simulation Monte Carlo, through the

exposition of concepts, case analysis and group activities to evaluate and manage investment projects under conditions of risk and uncertainty.

MGE5052 TOTAL QUALITY IN CONSTRUCTION PROCESSES

Analyze the philosophy and methodology of total quality control models applied to civil works, as well as the characteristics and techniques for their implementation, through the application of specific concepts of development in quality control systems, which allow to have methodological techniques that include statistical tools for planning, control, and high quality management in customer service.

MGE5062 SELECT TOPICS

Deepen on the current issues and trends within the construction sector in order to keep the student updated, through the analysis of real problems related to project management, to propose solutions and respond to the needs detected within this sector.

MGE5072 ADVANCED SELECT TOPICS

Develop strategies and propose solutions to problems related to the Management of Construction Projects, through the analysis of case studies and the application of methodologies used within this sector, to respond efficiently and effectively to the needs detected in construction.

MNS5142 LEADERSHIP AND TALENT MANAGEMENT

Describe current theories on leadership and talent management, to design and implement the processes of attracting, developing and retaining talent in an organization from a strategic perspective by analyzing the different leadership styles and current theories in talent management.

REP5012 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MGE5082 FINAL PROJECT

Apply the knowledge acquired during the program through the elaboration and presentation of a project that involves different concepts, with a theoretical framework and a conceptual analysis to propose a comprehensive solution strategy that allows to address the problem identified in construction projects.

MASTER IN GOVERNANCE AND GLOBALIZATION

MGG5012 GOVERNANCE AND POLITICAL THEORY

Identify the fundamental contents of governance theory, by reviewing information on political theory and governance in order to analyze the new presence of the State, the market and civil society in contemporary societies, both globally, nationally and locally.

MGG5022 INTERNATIONAL RELATIONS: GLOBALIZATION AND REGIONALISM

Analyze the main processes that have shaped the international economic system, through the historical review of theories and models around international relations, to explain the economic effects and the impact of the processes of globalization and regionalism.

MIM5032 INTERNATIONAL BUSINESS

Analyze the international business environment and strategies; through methodologies and practices, in order to develop professional analysis of a given market abroad for a particular product/company and industry.

MGG5032 GLOBAL POLITICAL ECONOMY

Analyze processes, methods and perspectives of the global political economy, through theoretical discussion and projects on the recent transformations of the world economy in order to detect the repercussions at the national and international level.

MGG5042 INTERNATIONAL STUDIES

Analyze the key concepts of the discipline in the contemporary context, by linking the empirical and theoretical-conceptual elements of the most important aspects of international relations, in order to have the necessary analytical tools to observe, understand and argue about foreign policy.

MGG5052 NATIONAL SECURITY IN A GLOBAL CONTEXT

Analyze the mutual influence between national security and globalization, in an area of interaction and contemporary international dynamism, by understanding the consequences of national policies in a globalized interaction scheme, in order to have the necessary analytical tools to promote necessary changes in the policies of the matter.

MGG5062 GOVERNANCE AND CONSTITUTIONALITY

Link the problems of government policies and constitutional change in environmental matters, through the analysis of ecological impacts worldwide, in order to understand changes in ecosystems and reconcile in search of a solution.

MGG5072 LOBBYING

Review the dynamics of public policy production and thus propose alternative courses to strategic actors within the framework of the Mexican political system with attention to the conditions of the international system, through knowledge of the theory of governance and the application of its main approaches to contemporary problems, whether global, national or regional , to obtain a favorable resolution or agreement in the exercise of public power.

MGG5082 SELECT TOPICS

To analyze in depth the current issues on governance and globalization, in order to be at the forefront of the topics related to the various aspects that make up the field of study of governance, through the review of theories and the application of their main approaches to contemporary problems, whether global, national or regional.

MGG5092 ADVANCED SELECT TOPICS

To analyze in depth the innovative issues in the area of governance and globalization, through the identification of current theories and perspectives and the application of their main approaches to

contemporary problems, in order to be updated on issues related to the various aspects that make up the scope of study of governance.

MGG5102 GOVERNANCE AND INTERNATIONAL ORGANIZATIONS

To assess the role of intergovernmental and non-governmental institutions, as well as their impact on global governance, by identifying and solving contemporary global problems, in order to propose new ways in which international organizations can contribute to more effective and efficient global governance.

REP5012 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MGG5112 FINAL PROJECT

Design a project that proposes solutions to socio-political problems both national and international, through the selection and application of a methodology according to the particular case study, in order to analyze the elements of a public policy with the intention of improving it and carrying out the implementation of it.

MASTER IN MARKETING

MNE5012 QUANTITATIVE METHODS FOR DECISION-MAKING

Identify and analyze the theoretical foundations of probability and statistical theory applicable to the solution of specific business situations, through the use of quantitative methods to manage and solve specific problems using software.

MNE5022 HUMAN CAPITAL MANAGEMENT

Apply the processes of selection, recruitment and hiring to incorporate workers into an organization, as well as their development and training, the forms of separation and motivation of human beings within the workplace, by preparing human capital management strategies to attract and retain talent.

MFD5012 FINANCIAL ANALYSIS

Apply the main accounting and mathematical financial concepts, through the analysis and interpretation of necessary financial information, for business decision-making.

MNE5032 BUSINESS ECONOMICS

Apply the tools of Economic analysis to solve the problems faced by companies in their decisions by applying knowledge about supply and demand with market behavior, their inputs and their products. Recognize the interrelationship of production and costs in the decision-making of the company, the different market structures and their characteristics to establish the different alternative strategies that will determine the performance of your company through the economic analysis of the different internal and external factors that affect the performance of the company.

MMK5012 STRATEGIC MARKETING

Analyze the decisions of the marketing management designing the value proposition of the company's products and services, for the development of strategies that allow the positioning of the organization and the achievement of its objectives.

MMK5022 MARKET ANALYSIS

Select the exact and pertinent information that allows to analyze the problems related to the commercialization of goods and services to reduce the uncertainty in the decision-making of the market, through the use of research tools, the analysis cases and business problems.

MMK5032 BRANDING

Distinguish the value and importance of creating strong brands adapted to time and place, through the application of methodologies, portfolio creation and business case analysis, to develop comprehensive marketing strategies that maximize brand capital value.

MMK5042 RETAILING

Develop a strategic plan of retail administration through the study of the marketing mix, consumer analysis and the application of Market Research tools, to position the company in the market.

MMK5052 SELECT TOPICS

Examine cutting-edge topics in the topics related to the various aspects that make up the field of marketing, through the solution of practical exercises and case analysis, in order to compare the current context and respond to the current needs of the sector.

MMK5062 ADVANCED SELECT TOPICS

Delve into current and cutting-edge marketing issues based on the needs of organizations, through the integration and use of tools and methodologies, as well as case analysis, to solve problems and add value to organizations.

MNE5122 CORPORATE MANAGEMENT AND STRATEGY

Formulate strategic actions to guide business decisions towards the achievement of their objectives; through the use of tools for the analysis of the external environment of a company and its competitive position. Develop and implement organizational structures and systems for evaluating strategic actions for the achievement of business objectives, through business case solutions.

REP5022 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MMK5072 FINAL PROJECT

Prepare an academic document, case study, concrete project or real problem of business application, particularly in the area of marketing through the integration of relevant theories and tools, for decision-making and problem solving.

MASTER IN INTERNATIONAL MANAGEMENT

MIM5012 MANAGERIAL FINANCE
Apply the main accounting and mathematical concepts, through the analysis and interpretation of the financial information of the company, for business decision-making.

MIM5022 BUSINESS STATISTICS
Describe the quantitative tools of probability, statistics, linear programming and econometrics, by using Excel tools (such as solver and regression), to solve problems of specific business situations.

MIM5032 INTERNATIONAL BUSINESS
Analyze the international business environment and strategies; through methodologies and practices, in order to develop professional analysis of a given market abroad for a particular product/company and industry.

MIM5042 INTERNATIONAL MARKETING
Identify strategies constantly used in international markets, through the development of practical plans and projects related to international marketing, to use controllable variables in the formulation of a marketing mix in multi-domestic and/or global strategies.

MIM5052 INTERNATIONAL ADMINISTRATION
Identify the cultural aspects that can influence the operation and overall success of the company, analyzing the importance and complexity of different societies throughout the world, to learn to interact in different contexts.

MIM5062 MANAGERIAL ECONOMICS
Describe the different market structures and their characteristics, combine knowledge about supply and demand with market behavior, their inputs and products, and recognize the interrelationship of production and costs in the company's decision-making; by explaining theories, practical examples and group dynamics; to establish the different alternative strategies that will determine the performance of the company.

MIM5072 INTEGRATED MARKETING COMMUNICATIONS
Discuss the importance of communicating to the customer the products or services offered, through the different tools of integrated marketing communication for the realization of integrated communication campaigns.

MIM5082 SALES STRATEGIES
Discuss methodologies, tools and ways to improve sales in companies in order to develop strategic relationships, through understanding the marketing process in order to effectively manage the sales force.

MIM5092 SELECT TOPICS (CONTEMPORARY TOPICS)
Discuss concepts of entrepreneurship, human resources, operations, technology, finance or current marketing and complement them to the curriculum, through the presentation of theories, models, case solutions and group discussions, to complement the student's training.

MIM5102 ADVANCED TOPICS
Discuss current business concepts and/or complementary to the curriculum, through presentation of theories, models, case solutions and group discussions, to complement the training of the student.

MIM5112 TRANSNATIONAL ADMINISTRATION
Discuss the main problems in the strategic management and organization of transnational companies, through an internal and external analysis that allows them to determine their position in the sector, as well as to address the main challenges and decision-making effectively.

REP5012 CORPORATE AND PROFESSIONAL RESPONSIBILITY
Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MIM5122 FINAL PROJECT
Discuss methodologies for selection, development and solution of case studies and business projects, through the presentation of theories and review of proposals, to develop academic documentation of concrete business application, particularly in the area of international business.

MASTER IN CLINICAL PSYCHOLOGY

MPC5012 NEURODEVELOPMENTAL DISORDERS
Identify neurodevelopmental disorders, through the study of the etiology, diagnostic classification and characteristics of the disorders, to propose the most appropriate forms of evaluation and treatment.

MPC5022 EMOTIONAL AND BEHAVIORAL DISORDERS
Analyze the symptoms and characteristics of emotional and behavioral disorders, based on the diagnostic classification and etiology, to propose appropriate treatments focused on the patient.

MPC5032 NEUROPSYCHOLOGICAL AND PSYCHOTIC DISORDERS
To analyze neuropsychological, psychotic and biological needs-related disorders by carrying out a relevant clinical and differential assessment, by evaluating the diagnostic criteria of each disorder taking into account the essential characteristics associated with them, to distinguish the type of treatment that the patient should follow.

MPC5042 PSYCHOLOGICAL MEASUREMENT
Develop psychometric tests according to the needs that the diagnostic process requires, through the use of statistical techniques in the development of measurement instruments and the application of the criteria of validity, reliability and standardization that favor the relevance of the application and interpretation of the results, to obtain more information and make a diagnosis.

MPC5052 SPECIFIC PSYCHOLOGICAL INTERVENTIONS

Differentiate situations that require the application of specific psychological interventions through the use of techniques and methods that allow the identification and assessment of psychological factors in the individual sphere, such as psychosocial and contextual factors in specific groups of people in order to propose interventions that maintain a high degree of ethical responsibility.

MPC5062 COGNITIVE BEHAVIORAL PSYCHOTHERAPY

Identify the theoretical-practical aspects of the different modalities of cognitive-behavioral therapies, through the organization of intervention strategies for their potential application in the modification of behaviors.

MPC5072 HEALTH PSYCHOLOGY

Identify the principles of health psychology through the analysis of the methodological, explanatory and conceptual aspects of the human being and its relationship with the processes of health and disease to apply some of the most used psychological interventions in the field of health psychology.

MPC5082 CRISIS INTERVENTION

Apply models of crisis intervention through the mastery of the appropriate methods and techniques for its management in order to intervene from psychology in a situation of crisis, emergencies and disasters containing and providing specialized care.

MPC5092 SELECT TOPICS

To evaluate the current approaches to health psychology by analyzing their implications at the individual, group or community level in order to develop prevention and intervention strategies according to the main health problems.

MPC5102 ADVANCED SELECT TOPICS

Develop forms of intervention in vulnerable groups, identifying the main problems that currently affect society, in order to propose strategies for prevention as well as a timely treatment.

MPC5112 PSYCHOLOGICAL INTERVIEW

Develop skills in the management of the psychological interview by analyzing the theory and technique of the interview in its different modalities to obtain concise information, thus conducting effective interviews in the field of clinical and health psychology.

REP5012 CORPORATE AND PROFESSIONAL RESPONSIBILITY

Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MPC5122 FINAL PROJECT

Develop an integrating project in the areas of clinical psychology and health, through the integration of concepts, theories and techniques, for the proposal of a treatment focused on problem solving.

MASTER IN SPORTS PSYCHOLOGY

MPE5012 FUNDAMENTALS OF SPORTS PSYCHOLOGY

Identify the basic concepts of sports psychology and physical activity, through the application of the main theoretical contributions and intervention models to analyze the emotional and psychological factors that affect the athlete.

MPE5022 PSYCHOLOGY FOR SPORTS COACHES

Apply the various techniques of psychological intervention through the analysis of the leadership and communication factors that influence the performance of sports coaches, to achieve greater effectiveness in their professional functions of counseling at the individual or group level.

MPE5032 EXERCISE PHYSIOLOGY

Analyze the various physiological responses of the organism during physical activity, through the evaluation of the components of physical systems and their adaptation mechanisms, to contribute to the improvement of the performance of athletes.

MPE5042 TRAINING METHODOLOGY

Apply the training process by analyzing the fundamental aspects of the dosage of physical exercise, in order to contribute effectively and timely in the performance of your sports routines maximizing their potential.

MPE5052 SPORTS TRAINING PSYCHOLOGY

Evaluate the process of sports training, through the application of the main methods and learning systems of technical execution based on the recognition of psychological factors, in order to increase performance and improve the competitive capacity of the athlete.

MPE5062 SPORTS SCIENCES

Distinguish the different scientific perspectives that make up the disciplines of sport, through an analysis based on the comparison of the various social, political, communication, gender and sports pedagogy factors, to assume a professional position based on the practice and education of sport at its different levels.

MPE5072 PSYCHOLOGICAL INTERVENTION TECHNIQUE

Apply the techniques of psychological intervention, through the analysis of the various phases, sports situations and social actors, to increase the physical performance of athletes.

MOR5072 GROUP COUNSELLING MANAGEMENT

Apply the techniques and tools of counseling and group management, through the analysis of the factors involved in the integration and collective dynamics in order to propose strategies that improve the functioning in the intergroup behavior and that contribute to the resolution of potential conflicts.

MPE5082 SELECT TOPICS

Analyze relevant topics in the area of sports psychology, distinguishing the different problems that affect physical performance, to react to the required needs of the individual, group or community of athletes.

MPE5092 ADVANCED SELECT TOPICS
Develop strategies on relevant topics in the field of sports psychology, through the application of tactics based on avant-garde theories, for their subsequent implementation in the sports field.

MOR5012 PSYCHOLOGICAL INTERVIEW
Develop skills in the management of the psychological interview, through the application of models and techniques of a verbal nature and of managerial and non-directive interventions, for the correct decision-making and solution of problems.

REP5022 CORPORATE AND PROFESSIONAL RESPONSIBILITY
Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MPE5102 FINAL PROJECT
Develop projects based on the various areas of the psychology of physical activity and sport, through the application of knowledge about the modalities of psychological intervention acquired, in order to propose improvements to sports practice and promote better performance to the athlete.

MASTER IN ORGANIZATIONAL PSYCHOLOGY

MOR5012 PSYCHOLOGICAL INTERVIEW
Develop skills in the management of the psychological interview, through the application of models and techniques of a verbal nature and of managerial and non-directive interventions, for the correct decision-making and solution of problems.

MOR5022 ORGANIZATIONAL CHANGE
Apply tools to assess the behavior of individuals as fundamental pieces in the development of the organization, through the relevant diagnosis that allows the planning of interventions to contribute to the change of the work culture.

MOR5032 PSYCHOLOGICAL EVALUATION
Evaluate the behaviors of individuals and groups immersed in the organizational context, through the development of psychological tests according to criteria of validity, reliability and standardization in order to obtain timely information for the development of organizations.

MOR5042 PRODUCTIVITY AND CREATIVITY
Apply the procedures that allow the development of creativity within organizations, through the analysis of the principles that regulate the response and motivation, in order to implement improvement and innovation strategies in the production processes.

MOR5052 ADVANCED QUALITATIVE AND QUANTITATIVE RESEARCH METHODS
Analyze the applications of the scientific method in the elaboration of projects, through the development of research designs according to the area, to obtain information that allows to propose appropriate interventions.

MOR5062 LEADERSHIP PSYCHOLOGY AND DECISION MAKING
Distinguish the role of leadership within organizations, by identifying their main attributions and their implications in decision-making, to plan and implement changes within the organization.

MOR5072 COUNSELING AND GROUPS MANAGEMENT
Apply the techniques and tools of counseling and group management, through the analysis of the factors involved in the integration and collective dynamics in order to propose strategies that improve the functioning in the intergroup behavior and that contribute to the resolution of potential conflicts.

MOR5082 ORGANIZATIONAL DIAGNOSIS
Analyze the aspects of organizational diagnosis by identifying the main factors of evaluation of organizational processes, in order to apply continuous improvements that ensure quality in the corporation.

MOR5092 SELECT TOPICS
Analyze current topics on organizational psychology, through the identification of technical procedures and methodologies, in order to provide solutions to the problems of the organization.

MOR5102 ADVANCED SELECT TOPICS
Develop fundamental competencies on relevant topics in the main areas of organizational psychology through detailed analysis of knowledge on specific topics of psychology at work to carry out effective interventions in organizations.

MOR5112 ORGANIZATIONAL CONSULTING
Apply solutions to the main problems that exist in an organization, by identifying the role of the consultancy as well as the processes, designs and interventions, to achieve purposes and objectives set in the organization.

REP5022 CORPORATE AND PROFESSIONAL RESPONSIBILITY
Recognize the theoretical and practical relevance of the concepts of professional and corporate responsibility, through the preparation of strategies and instruments to position a company as socially responsible. Recognize and define the legal obligations it has in the performance of the Profession, through the recognition of its obligations under current legislation to identify the responsibility incurred in any breach of these duties.

MOR5122 FINAL PROJECT
Develop competencies in the design of intervention projects in the fields of organizational psychology through the application of intervention processes, strategies and tools to achieve implementation of effective proposals in the organization.