

ROBOTIC ENGINEERING

OBJECTIVE

To train Robotic Engineers leaders in their professional field with capacity to: design, develop, implement and optimize processes, products and services in the Robotics field that contribute to the solution of specific needs in the scope of: design and development of robots, automation systems, reengineering and management, with quality and respect for the environment in an ethical and humanistic framework.

DESIRABLE ASPIRANT PROFILE:

a) Knowledge

It is desirable that you have knowledge of the next disciplines:

- Maths and physics.
- Basic computing.

b) Skills

- Logical and abstract reasoning.
- Capacity for analysis and synthesis.

c) Attitudes:

- Critical.
- Interest in robotics.
- Interest in science and technology.
- Favorable disposition towards the study.
- Willingness to work as a team.

PROFILE OF THE GRADUATE:

The curriculum of the Engineer in Robotics is based on the Educational Model Institutional from which the student will construct the following:

Knowledge of:

1. Fundamentals of Mathematics and Physics.
2. Fundamentals of electricity, analog and digital electronics.
3. Fundamentals of materials science.
4. Principles of safety and industrial regulation.
5. Principles of project management and evaluation.
6. Principles of functioning of the human body.
7. Fundamentals of Human Resource Management.
8. Application of programming languages, simulation software, hybrid systems and robotic vision.
9. Application of embedded systems.
10. Application of control theory.
11. Application of mechanics and mechanisms.
12. Application of industrial automation techniques.
13. Application of kinematics and control theory in robot manipulators.
14. Application of path planning techniques in mobile robots.
15. Application of equipment maintenance techniques.
16. Advanced English language with technical knowledge in the area.

Skills for:

1. Design and develop robotic systems to standardize products that are manufactured in series and reduce manufacturing time and cost.
2. Design and develop rehabilitation equipment with robotic systems to improve the quality of life of people with different capacities or in rehabilitation processes.
3. Design and develop teleoperated robots to replace workers in situations of risk.
4. Install, program and integrate robotic systems to solve problems in manufacture.
5. Maintain robotic systems for optimum operation and avoid subsequent failures.

6. Guide in the selection and use of technology to provide solutions to specific problems in the area of robotics under safety, quality and environmental care standards.
7. Redesign automatic control systems and robots in order to adapt them to specific needs.
8. Modify automatic control systems and robots to adapt them to new requirements.
9. Modify rehabilitation equipment to increase the safety and quality of life of people.
10. Design and develop automatic control systems to standardize the products that are manufactured in series and reduce manufacturing time and cost.
11. Install, program and integrate automatic control systems to solve manufacturing problems.
12. Maintain automation systems for optimum operation and avoid subsequent faults.
13. Manage the creation, acquisition and use of technology for automation systems and robotics.
14. Lead and supervise engineering areas that support automation and robotics systems.
15. Use the English language in all four skills: writing, reading comprehension and oral production.

Attitudes:

1. Provision for continuous updating.
2. Critical and reflexive.
3. Innovative.
4. Willing to work in interdisciplinary and multidisciplinary teams.
5. Respectful of the environment.
6. Entrepreneur.
7. Ethic.

Values:

1. Autonomy.
2. Social responsibility.
3. Pluralism.
4. Humanism.
5. Quality in their professional performance.

WORK FIELD:

- Industrial Sector
- Service companies.
- Research and development institutes.
- Public sector.
- You can collaborate with related professionals and in multidisciplinary teams.
- You can join established companies or provide their services independently.
- Anywhere that requires a development of Robotics or Automation Systems.

DURATION:

Nine semesters.

CENTER OF ENGINEERING SCIENCES

ROBOTIC ENGINEERING

CURRICULUM

**PROGRAM 2012
CAREER 48**

First semester

INTRODUCTION TO ROBOTIC ENGINEERING
ALGEBRA
DIFERENTIAL CALCULUS
PROGRAMING LOGICS
ENGINEERING AND SOCIETY

CENTER

ENG. SCIENCES
BASIC SCIENCES
BASIC SCIENCES.
BASIC SCIENCES
S. AND H. SCI'S

DEPARTMENT

ROBOTICS
MATHS
MATHS
ELECTRONICS
PHILOSOPHY

Second semester

LOGICAL CIRCUITS
MATERIAL CHEMISTRY
LINEAR ALGEBRA
INTEGRAL CALCULUS
PHYSICS I

CENTER

BASIC SCIENCES
BASIC SCIENCES
BASIC SCIENCES
BASIC SCIENCES.
BASIC SCIENCES

DEPARTMENT

ELECTRONICS
CHEMISTRY
MATHS
MATHS
MATHS

Third semester

COMPUTATIONAL ORGANIZATION
PROGRAMMING I
PHYSICS II
VECTOR CALCULUS
DIFFERENTIAL EQUATIONS
Institutional Program of Foreign Languages
Institutional Program of Humanist Formation

CENTER

BASIC SCIENCES.
BASIC SCIENCES
BASIC SCIENCES
BASIC SCIENCES
BASIC SCIENCES

DEPARTMENT

ELECTRONICS
ELECTRONICS
MATHS
MATHS
MATHS

Fourth semester

MECHANICS
CAD FOR ENGINEERING
EMBEDDED SYSTEMS FOR ROBOTICS
ELECTRONIC CIRCUITS I
PROGRAMMING II
PHYSICS III
Institutional Program of Foreign Languages
Institutional Program of Humanist Formation

CENTER

ENG. SCIENCES
ENG. SCIENCES
ENG. SCIENCES
BASIC SCIENCES
BASIC SCIENCES
BASIC SCIENCES

DEPARTMENT

AUTOMOTIVE
AUTOMOTIVE
ROBOTICS
ELECTRONICS
ELECTRONICS
MATHS

Fifth semester

MATERIALS FOR ENGINEERING
ELECTRONIC CIRCUITS II
SYGNAL ANALYSIS
COMPUTING FOR ENGINEERING
PROBABILITY AND STATISTICS
WRITING SCIENTIFIC TEXTS
Institutional Program of Foreign Languages
Social Service Institutional Program (Induction course)

CENTER

ENG. SCIENCES
BASIC SCIENCES
ENG. SCIENCES
BASIC SCIENCES
BASIC SCIENCES
ARTS

DEPARTMENT

ROBOTICS
ELECTRONICS
BIOMEDICAL
ELECTRONICS
STATISTICS
HISPANIC L.

Sixth semester

ELECTRONICS
INDUSTRIAL MACHINES
CONTROL SYSTEMS
UNIX
STATISTICAL INFERENCE
PERSONAL FINANCE
Institutional Program of Foreign Languages
Social Service Institutional Program

CENTER

BASIC SCIENCES
ENG. SCIENCES
ENG. SCIENCES
BASIC SCIENCES
BASIC SCIENCES
ECONOMICS

DEPARTMENT

ELECTRONICS
ROBOTICS
ROBOTICS
ELECTRONICS
STATISTICS
FINANCE

Seventh semester

ROBOT MANIPULATORS
PARTS MANUFACTURING
CAM FOR ENGINEERING

CENTER

ENG. SCIENCES
ENG. SCIENCES
ENG. SCIENCES

DEPARTMENT

ROBOTICS
ROBOTICS
ROBOTICS

CENTER OF ENGINEERING SCIENCES

ROBOTIC ENGINEERING

INDUSTRIAL INSTRUMENTATION
DIGITAL CONTROL SYSTEMS
HUMAN RESOURCES MANAGEMENT
PROFESSIONAL ETHICS
Institutional Program of Foreign Languages
Social Service Institutional Program

ENG. SCIENCES
ENG. SCIENCES
ECONOMICS
S. AND H. SCI'S

ROBOTICS
ROBOTICS
HR
PHILOSOPHY

Eighth semester

MOBILE ROBOTICS
OPTIONAL PROFESSIONAL I
OPTIONAL PROFESSIONAL II
INDUSTRIAL CONTROL SYSTEMS
OSTEOMUSCULAR SYSTEM
MANAGEMENT SKILLS
ECONOMIC EVALUATION OF PROJECTS
Social Service Institutional Program

CENTER

ENG. SCIENCES

DEPARTMENT

ROBOTICS

ENG. SCIENCES
BASIC SCIENCES
ECONOMICS
ECONOMICS

ROBOTICS
MORPHOLOGY
ADMIN
FINANCE

Ninth semester

INTEGRAL PROJECT (INTERNSHIP)
Social Service Institutional Program

CENTER

ENG. SCIENCES

DEPARTMENT

ROBOTICS

INSTITUTIONAL PROGRAMS

- Professional practices
- Social service
- Tutorials
- Mobility and Academic Exchange
- Promotion of foreign languages
- Humanist Training Program

DEGREE REQUIREMENTS

The graduate must adhere to what is established in Chapter XIV of the degree at the technical, technical level superior and bachelor's degree, article 156 of the General Teaching Regulation that states the following: "Once you have accredited all the subjects and requirements indicated in the curriculum of the level courses technician, technical superior and bachelor, the graduate can request the issuance of his degree in the Department of School Control, after complying with the following elements:

I.- Have fulfilled the requirements of Social Service, Humanistic Training, Professional Practices and Foreign Languages, defined in institutional programs;

II.- Check that there is no debit with the Autonomous University of Aguascalientes;

III.- Have covered the quota established in the plan of taxation to obtain the title; and

IV.- Have submitted the exit exam."