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 responsability.
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	CENTER	DEPARTMENT
INTRODUCTION TO ROBOTIC ENGINEERING	ENG. SCIENCES	ROBOTICS
ALGEBRA	BASIC SCIENCES	MATHS
DIFERENTIAL CALCULUS	BASIC SCIENCES.	MATHS
PROGRAMING LOGICS	BASIC SCIENCES	ELECTRONICS
ENGINEERING AND SOCIETY	S. AND H. SCI'S	PHILOSOPHY

Second semester	CENTER	DEPARTMENT
LOGICAL CIRCUITS	BASIC SCIENCES	ELECTRONICS
MATERIAL CHEMISTRY	BASIC SCIENCES	CHEMISTRY
LINEAR ALGEBRA	BASIC SCIENCES	MATHS
INTEGRAL CALCULUS	BASIC SCIENCES.	MATHS
PHYSICS I	BASIC SCIENCES	MATHS

Third semester	CENTER	DEPARTMENT
COMPUTATIONAL ORGANIZATION	BASIC SCIENCES.	ELECTRONICS
PROGRAMMING I	BASIC SCIENCES	ELECTRONICS
PHYSICS II	BASIC SCIENCES	MATHS
VECTOR CALCULUS	BASIC SCIENCES	MATHS
DIFFERENTIAL EQUATIONS	BASIC SCIENCES	MATHS
Institutional Program of Foreign Languages		
Institutional Program of Humanist Formation		

Fourth semester	CENTER	DEPARTMENT
MECHANICS	ENG. SCIENCES	AUTOMOTIVE
CAD FOR ENGINEERING	ENG. SCIENCES	AUTOMOTIVE
EMBEDDED SYSTEMS FOR ROBOTICS	ENG. SCIENCES	ROBOTICS
ELECTRONIC CIRCUITS I	BASIC SCIENCES	ELECTRONICS
PROGRAMMING II	BASIC SCIENCES	ELECTRONICS
PHYSICS III	BASIC SCIENCES	MATHS
Institutional Program of Foreign Languages		
Institutional Program of Humanist Formation		

Fifth semester	CENTER	DEPARTMENT
MATERIALS FOR ENGINEERING	ENG. SCIENCES	ROBOTICS
ELECTRONIC CIRCUITS II	BASIC SCIENCES	ELECTRONICS
SYGNAL ANALYSIS	ENG. SCIENCES	BIOMEDICAL
COMPUTING FOR ENGINEERING	BASIC SCIENCES	ELECTRONICS
PROBABILITY AND STATISTICS	BASIC SCIENCES	STATISTICS
WRITING SCIENTIFIC TEXTS	ARTS	HISPANIC L.
Institutional Program of Foreign Languages		
Social Service Institutional Program (Induction course)		

Sixth semester	CENTER	DEPARTMENT
ELECTRONICS	BASIC SCIENCES	ELECTRONICS
INDUSTRIAL MACHINES	ENG. SCIENCES	ROBOTICS
CONTROL SYSTEMS	ENG. SCIENCES	ROBOTICS
UNIX	BASIC SCIENCES	ELECTRONICS
STATISTICAL INFERENCE	BASIC SCIENCES	STATISTICS
PERSONAL FINANCE	ECONOMICS	FINANCE
Institutional Program of Foreign Languages		
Social Service Institutional Program		

Seventh semester	CENTER	DEPARTMENT
ROBOT MANIPULATORS	ENG. SCIENCES	ROBOTICS
PARTS MANUFACTURING	ENG. SCIENCES	ROBOTICS
CAM FOR ENGINEERING	ENG. SCIENCES	ROBOTICS

INDUSTRIAL INSTRUMENTATION	ENG. SCIENCES	ROBOTICS
DIGITAL CONTROL SYSTEMS	ENG. SCIENCES	ROBOTICS
HUMAN RESOURCES MANAGEMENT	ECONOMICS	HR
PROFESSIONAL ETHICS	S. AND H. SCI'S	PHILOSOPHY
Institutional Program of Foreign Languages		
Social Service Institutional Program		

Eighth semester	**CENTER**	**DEPARTMENT**
MOBILE ROBOTICS	ENG. SCIENCES	ROBOTICS
OPTIONAL PROFESSIONAL I		
OPTIONAL PROFESSIONAL II		
INDUSTRIAL CONTROL SYSTEMS	ENG. SCIENCES	ROBOTICS
OSTEOMUSCULAR SYSTEM	BASIC SCIENCES	MORPHOLOGY
MANAGEMENT SKILLS	ECONOMICS	ADMIN
ECONOMIC EVALUATION OF PROJECTS	ECONOMICS	FINANCE
Social Service Institutional Program		

Ninth semester	**CENTER**	**DEPARTMENT**
INTEGRAL PROJECT (INTERNSHIP)	ENG. SCIENCES	ROBOTICS
Social Service Institutional Program		

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."