

BIOMEDICAL ENGINEERING

OBJECTIVE

The graduate student will be capable of design and install medical devices and systems. The biomedical engineer can perform feasibility studies for the acquisition, maintenance and calibration of clinical equipment. He will be able to work in Medical Equipment Design, Applied Research and Clinical Engineering Management. The student will receive a technical education balanced with a humanist perspective to achieve personal development and for benefit of its community.

DESIRABLE STUDENT PROFILE:

These are the desirable traits for a student to achieve a successful performance throughout the Biomedical Engineering Program:

a) Knowledge

- Mathematical physics
- Natural Sciences
- Basic electricity
- Basic computing

b) Skills

- Abstract reasoning
- Constancy and dedication in the study
- Manual dexterity.
- Affinity to work and study real world problems.
- Team work.

c) Attitudes

- Affinity for electronics.
- Interest in scientific and technological information.
- Personal and social improvement.
- Social, ecological and community involvement.

PROGRAM OUTCOME:

Upon completion of the Biomedical Engineering program, graduates are expected to have the following set of skills:

Abilities:

- Analyze variables and physiological structures for the design of Biomedical Systems
- Design, build and put in place biomedical devices, equipment and systems.
- Test equipment.
- Develop versatile biomedical devices for telemedicine environments.
- Redesign and rehabilitation of obsolete equipment.
- Develop applied research projects
- Develop data acquisition systems from biomedical sensors.
- Perform benefit cost studies for acquisition, maintenance and calibration of the medical equipment.
- Provide preventive, corrective and predictive maintenance to clinical devices and systems.
- Compliance with safety regulations and use of medical equipment
- Design and execute training programs for the operation of medical equipment.
- Maintain effective communication with suppliers, engineers and professionals in the health area.
- Fluid English communication in the field of Biomedical Engineering

Knowledge:

- Mathematical, physical, chemical and biological principles

- Principles of human physiology and clinical biochemistry
- Electronic medical instrumentation
- Medical signs
- Analog and digital electronic systems.
- Computer programming and applications
- Principles of operation of the main medical equipment
- Theory of engineering design
- Engineering project management bases and the medical equipment market
- Research methodology
- Preventive, corrective and predictive maintenance schemes and strategies.
- Technical specifications of equipment.
- Electrical installations.
- Technical regulations and guidelines for bidding process in the acquisition of equipment.
- Management of material, human and financial resources as well as medical equipment management.
- Quality systems of the medical care service

Attitudes

1. Disposition to keep on updating continues.
2. Propose creative and innovative solutions to engineering problems.
3. Willingness to work as a team.
4. Opening to develop in multidisciplinary teams.
5. To work with criteria of respect to the environment.
6. Have an entrepreneurial spirit.
7. Human Development.

Values

1. Autonomy and Social Responsibility.
2. Pluralism
3. Humanism
4. Quality

PROSPECTIVE WORK FIELD:

The contexts in which these professionals work correspond to clinics, research and development. The biomedical engineer works in companies developing medical equipment and hospital support services. They can collaborate with related professionals in multidisciplinary teams. Some examples are hospitals, electronics design companies, biotechnology companies and pharmaceutical enterprises, among others.

DURATION:

Nine semesters.

CURRICULUM

Program 2012
Career 47

	CENTER	DEPARTMENT
First Semester		
CHEMISTRY	BASIC SCIENCE	CHEMISTRY
ALGEBRA	BASIC SCIENCE	MATHS & PHY
INTRODUCTION TO BIOMEDICAL ENGINEERING	ENG. SCIENCE	BIOMEDICAL
BIOLOGY	BASIC SCIENCE	BIOLOGY
DIFFERENTIAL CALCULUS	BASIC SCIENCE	MATHS & PHY
OPERATIVE GROUPS	SOC & HUMAN SCI	SICOLOGY

Second Semester

LINEAR ALGEBRA
 INTEGRAL CALCULUS
 CHEMISTRY OF BIOMATERIALS
 SCIENTIFIC TEXTS DRAFTING
 CINEMATICS AND STATICS

CENTER

BASIC SCIENCE
 BASIC SCIENCE
 BASIC SCIENCE
 ART & CULTURE
 BASIC SCIENCE

DEPARTMENT

MATHS & PHY
 MATHS & PHY
 CHEMISTRY
 HISP STUDIES
 MATHS & PHY

Third Semester

CRITICISM THINKING
 ELECTRICITY AND MAGNETISM
 LOGIC CIRCUITS
 SYS
 PROGRAMMING LOGIC
 SYS
 VECTORIAL CALCULUS
 MEDICAL BIOCHEMISTRY

CENTER

SOC & HUMAN SCI
 BASIC SCIENCE
 BASIC SCIENCE

DEPARTMENT

PHYLOSOPHY
 MATHS & PHY
 ELECTRONIC

Fourth Semester

DIFFERENTIALS EQUATIONS
 ELECTRIC CIRCUITS
 SYS
 FIELDS AND WAVES
 PROGRAMMING I
 SYS
 PHYSIOLOGY I

CENTER

BASIC SCIENCES
 BASIC SCIENCES
 BASIC SCIENCES
 BASIC SCIENCES
 BASIC SCIENCES

DEPARTMENT

MATHS & PHY
 ELECTRONIC
 MATHS & PHY
 ELECTRONIC
 PHYSIOLOGY

Fifth Semester

ELECTRONICS
 SYS
 COMPUTER ARCHITECTURE
 SYS
 PROGRAMMING II
 SYS
 HOSPITAL ELECTRICAL NETWORKS
 PHYSIOLOGY II
 BIOMEDICAL SIGNALS ANALYSIS

CENTER

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

DEPARTMENT

ELECTRONIC
 ELECTRONIC
 ELECTRONIC
 BIOMEDICAL
 PHYSIOLOGY
 BIOMEDICAL

Sixth Semester

BIOELECTRONICS
 BIOMEDICAL SIGNAL CONTROLLERS
 BIOINSTRUMENTATION
 PROBABILITY AND STATISTICS
 CONTROL SYSTEMS
 PERSONAL FINANCE

CENTER

ENG. SCIENCE
 ENG. SCIENCE
 ENG. SCIENCE
 BASIC SCIENCE
 ENG. SCIENCE
 EC & MANAG SCI

DEPARTMENT

BIOMEDICAL
 BIOMEDICAL
 BIOMEDICAL
 STATISTICS
 ROBOTICS
 FINANCE

Seventh Semester

MANAGEMENT SKILLS
 STATISTICAL INFERENCE
 BIOMEDICAL SYSTEMS AND EQUIPMENT
 BIOINSTRUMENTATION II

CENTER

EC & MANAG SCI
 BASIC SCIENCE
 ENG. SCIENCE
 ENG. SCIENCE

DEPARTMENT

BASIC MANAG
 STATISTICS
 BIOMEDICAL
 BIOMEDICAL

IMAGENOLOGY
SCIENCE, TECHNOLOGY AND VALUES

ENG. SCIENCE
SOC & HUMAN SCI

BIOMEDICAL
PHYLOSOHY

Eighth Semester

HOSPITAL BIOSECURITY
CLINICAL PROCESS ENGINEERING
ELECTIVE COURSE I
NETWORK DESIGN
SYS
ECONOMIC EVALUATION OF PROJECTS
ETHICS
ELECTIVE COURSE II

CENTER

ENG. SCIENCE
ENG. SCIENCE
ENG. SCIENCE
BASIC SCIENCE

DEPARMENT

BIOMEDICAL
BIOMEDICAL
BIOMEDICAL
ELECTRONIC

EC & MANAG SCI
SOC & HUMAN SCI
ENG. SCIENCE

FINANCE
PHYLOSOHY
BIOMEDICAL

CENTER

Ninth Semester

Intenrship Project

ENG. SCIENCE

DEPARMENT

BIOMEDICAL

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.”