THE IBY AND ALADAR FLEISCHMAN FACULTY OF ENGINEERING

The Zandman-Slaner School of Graduate Studies

http://www.eng.tau.ac.il

The M.Sc. program of the Faculty of Engineering enables students to expand the knowledge they acquired as undergraduates and to pursue in-depth specialization in an area of their choice. The Faculty offers two types of master's programs; a thesis-based program stressing research and a project-based course, with a practical-professional orientation.

The M.Sc. degree is awarded in:

- Electrical and Electronic Engineering
- Mechanical Engineering
- Environmental Engineering
- Industrial Engineering[1]
- Biomedical Engineering
- Materials Science and Engineering

0510 School of Electrical Engineering

Areas of study

Communication: Communication systems; information theory, algebraic coding, stochastic processes; sensory communication systems; synchronization systems.

Digital signal: Statistical and non-linear signal processing; signal detection and estimation; signal processing in sensory communication systems: speech, biomedical signals; radar signal processing; radar techniques and systems, navigation and detection; biomedical instrumentation: man-machine interfacing; sensory aids for perception defects.

Image Processing and Computer Vision: Enhancement, restoration and compression of visual data. Geometric and variational methods in image analysis. Three-dimensional imaging and photography. Automatic analysis of video streams. Camera arrays.

1 M.Sc. in Industrial Engineering, or M.Sc. in Industrial Engineering and Management if a student completed the management track.

Medical imaging and analysis. Distributed image and video processing.

Control systems: Analog and digital control; real-time control, optimal control and system identification; adaptive control; filtering theory; multivariable control systems theory; fuzzy logic and fuzzy systems.

Computer engineering: VLSI systems; embedded computer systems; distributed processing; algorithms and parallel computing; computer architectures; computer graphics/computer-aided design. Artificial intelligence: neural networks; genetic algorithms; automata theory; fuzzy systems; fuzzy expert systems.

Micro and Nano-electronics: devices and materials:

Microelectronic and opto-electronic devices; VLSI; MEMS, MOEMS, BioMEMS and Lab-on-chip; biosensors; electronic materials characterization; ferroelectric materials, thin films and devices; semiconductor sensors and radiation damages; plasma based processes: high-current vacuum arcs and metallurgical depositions; micro-batteries; nano-materials and devices; microelectronics reliability.

Electro-optics: devices and systems: Optical communications, fibers, sensing systems; electro-optics for computing; image recognition; laser optics and frequency stabilization; electro-optic devices; integrated optics; non-linear optics.

Electromagnetic waves: sources and systems: High-power microwave sources; free election lasers and mazers; electron/material interaction; Electromagnetic systems: microwaves and millimeter waves; antennas; wave propagation and scattering; target identification and inverse scattering; Radar imaging; underwater acoustics.

Electrical energy systems: **Power electronics, power processing systems, circuits & systems theory; photovoltaic systems; electrical machines and electronic drives.**

0540 School of Mechanical Engineering

Areas of study

Fluid Mechanics and Heat Transfer: Aerodynamics; hydrodynamics; real and ideal fluids; turbulence; gas dynamics; mass and heat transfer; visco-elastic fluids; stratified flow; multi-phase flow; water waves; bio-fluid mechanics; flow in porous medium; solar energy;

environmental engineering; computational fluid mechanics, micro-fluidics.

Solid Mechanics, Materials and Systems: Mechanics of elastic and inelastic solids; materials science; environmental behavior of materials; failure analysis; electrodeposition; composite materials; structural mechanics; plates and shells; thermomechanics; (MEMS) Robotics (sensors, vision, advanced actuators, control); fracture mechanics; fatigue; wave propagation and vibrations; biomechanics; robotics; optimization of structures; repetitive structures; numerical and finite elements methods; CAD-CAM; experimental mechanics; surface science; nanocrystal growth and characterization by diffraction and scanning probe methods.

0545 Environmental Engineering

Air pollution; control of particulate air pollutants; treatment of urban and industrial wastewater; solid-waste management; risk assessment in industrial process; mass transfer separation processes; evaluation of pollution source terms; transport of contaminants in groundwater; dispersion of air pollutants; vorticity dynamics of turbulent flows; sediment transport; thermal pollution of rivers and lakes; soil decontamination; development of bottoming thermodynamic cycles for energy conservation; solar energy; water desalination; slurry transportation in pipes; rapid granular flow.

0553 The Department of Bio-Medical Engineering

Areas of study

Digital signal processing in physiological systems; biofluids; biomechanics of the cardiovascular system; biomechanics of respiratory system; mechano-biology of cells; intracellular biophysical processes; neuro-electric systems; computers in medicine; medical imaging and digital image processing; human sensory communication; mathematical and numerical modeling; biomaterials; biopolymers; tissue engineering.

0571 The Department of Industrial Engineering

Areas of study

Logistics and Operations, Business Analytics, Human Factors, Information Systems, Supply Chain Management, Data Mining, Man Machine Interface, Social Networks, Transportation, Integrated production

systems; project management, robotics; Big Data, production planning and control; flexible manufacturing systems; decision analysis; game theory, experimental design and analysis of production systems; quality assurance methodology and techniques; inventory systems; technology management; Humanitarian Logistics. .

0581 The Department of Materials Science and Engineering

Areas of study

Materials for electronic, optical, electro-optical and micro-electromechanical applications. Nano-materials, Thin film materials. Composite materials. Environmental durability of materials. Bio-materials. Materials characterization.

External Courses

Several non-credit courses are open to engineers and M.Sc. graduates in the exact sciences who are employed in industry and scientific institutions.

For further information and specific details please contact the Zandman-Slaner School of Graduate Studies.
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