

# Formation of Medical Physics students in the field of electronic medical equipment

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Several years of expertise in teaching Medical Physics allowed to define the optimum program, taking under consideration both students predispositions and expectations, as well as the desired educational profile. Detailed presentation of medical equipment leaves place to an integrated presentation of information in biocybernetics, practical aspects of biological systems modelling, operation and use of electronic medical equipment and highly mathematized information concerning biological signals processing linked with automated medical diagnostics.

This allows an integrated (and not unbounded) presentation of the knowledge delivered to the students. An example of information chain:

Regulation of glucose level in blood (Biocybernetics) -> Simulation of the system, influence of interferences and inputs (Biological systems modelling) -> Structure and operation of the artificial pancreas (Medical equipment) -> Algorithms of processing signals from the artificial pancreas (Biological signals processing) -> Visualization diagnostics of the pancreas (Image identification and processing).

Thanks to numerous elective elements in the program, the presented information is subject to continuous updating and evolution. These processes are based on the experience of the Department of Automated Control personnel (the employees of the Department have all done additional studies or worked at the Medical Academy) as the issues related to the technology in medical sciences have been taught in different specializations of Electronics for more than ten years. Additionally a cooperation has been started within the international research-education program TEMPUS JEP 07181-94, which provided access to the ready-made British teaching software, also in Medical Technology. The Department of Automated Control, AGH also received free of charge the Authorware package, allowing independent creation of new interactive educational units. Therefore there are new course units, totally prepared by AGH, concerning the issues of computer processing and identification of images in medical diagnostics.

The modules proposed for Medical Physics students include:

Biocybernetics - lecture, 30 h,

Electronic Medical Equipment - lecture, 30 h, Practical, 30 h, Recording, monitoring and automated analysis of medical signals - lecture, 30 h, Practical, 30 h, Project, 15 h, Image processing and identification - Lecture, 30 h (elective) Modelling of biological signals and processes - Lecture, 30 h (elective), Practical, 30 h.

All the practicals and projects are carried out using original equipment of the Laboratory of Biocybernetics AGH (ultrasonographs, electrocardiographs, computer tomographs, artificial kidneys, specialized software and equipment).