UNIVERSITY of DEBRECEN

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Name of the course:	**Physics and technology of MEMS devices**
Course type:	Optional
Responsible lecturer:	Dr. Gábor Battistig
Content:	The use of micro electromechanical systems is essential in modern mechatronic and electronic systems. The area that primarily deals with the implementation of sensing principles in micro-scales is complemented by micro-actuator solutions. New fields of application also appear, e.g. medical-biological applications, modern analytical procedures. During the study of the subject, the students increase their knowledge of physics, materials science, measurement technology and system technology to a higher level. The discussion of material properties resulting from fundamental material properties is essential for understanding the processes of perception. Using the example of automotive sensors, sensor principles and sensor technologies for sensing various physical characteristics, issues of encapsulation, integration of sensors into the system, issues and solutions of sensor communication between sensors and within the system, and principles of sensor selection are presented. MEMS technology - as a special case of microtechnology - discusses the physical, mechanical, chemical, electrical, optical properties of the applied material families, the various processing procedures - applied material families, single crystal growth, lithography, additive and subtractive technologies, physical and chemical thin film depositions, wet chemical and plasma milling technologies, doping. packaging and encapsulation problems - as well as the applied material inspection, testing, modeling and simulation procedures. It gives an outlook towards the technique and technology of micro-scale interventionists.
Literature:	• A. Lenk, R.G. Ballas, R. Werthschützky, G. Pfeifer, Electromechanical Systems in Microtechnology and Mechatronics, Electrical, Mechanical and Acoustic, Networks, their Interactions and Applications Springer 2011, ISSN 1615-8326 • S.M. Sze, Semiconductor Sensors, John Wiley 1994, ISBN 0-471-54609-7