

Obuda University Bánki Donát Mechanical and Safety Engineering Faculty				Institute of Material Science and Technology	
Course title and code: Measurement technology I. BAGMT1ANND				Credits:2	
Full-time, 2017/18 academic year. 2. Semester					
Faculties in which the subject is taught: Bánki Donát Mechanical and Safety Engineering Faculty					
Lecturer in-structor	Ágota Drégelyi-Kiss			Instructor	Ágota Drégelyi-Kiss
Prerequisites conditions (code)			-		
Hours per week:	Lecture: 1	Practise: 1	Laboratory: 0	Consultation: 0	
Semester Closing way: (required)		é – practice mark			
Curriculum					
The objective of the course: The topics of the subject are the following: introduction to metrology, metric units, SI unit, the pyramid of accuracy, traceability of length, accuracy and uncertainty, calibration, Geometric dimensioning and tolerancing (GD&T), measurement principles: Abbe-, collimator-, Taylor-principles, Bessel points, the basics of 3D coordinate measurement, automotive supplier requirements (MSA, VDA5), legal metrology. Measurement with the following devices in practice: gage blocks, plug gages, small dimensional metrological tools: callipers, micrometers and indicators.					
Schedule					
Educational weeks	Lecture (Monday, 8:00-9:40, I. 114)			Exercise	
week 1	Basics of metrology, measurement error and uncertainty.			-	
week 2	-			1. Measurement uncertainty calculations, etalons	
week 3	The basic principles of dimensional measurements, errors of measurement equipments			-	
week 4	-			2. Calipers, micrometers	
week 5	Measurement law, legally verification and calibration. National metrological institutes, organizations for metrology			-	
week 6	-			3. Dial caliper	
week 7	Test 01			-	
week 8	-			HOLIDAY	
week 9	Measurement System Analysis (MSA) and VDA 5 (the german method for measurements) in automotive industry			-	
week 10	-			4. GRR study	
week 11	Measurement tools and methods in dimensional metrology			-	
week 12	-			HOLIDAY	
week 13	Test 02 ; Introduction to 3D CMM			-	
week 14	-			5. 3D CMM; Replacement of test 01 and 02	

<p>Conditions of getting practice mark:</p> <ul style="list-style-type: none"> • compulsory on the 60 % of the exercise classes. Failure of this means no signature for the fulfilment of the semester. No opportunity to retry. • successful exercise reports • successful test <p>Calculation practice mark: Grade (Test 1)</p>
Bibliography:
<p>Course books:</p> <ol style="list-style-type: none"> 1. David Flack and John Hannaford (2005): Measurement Good Practice Guide No. 80 -- Fundamental Good Practice in Dimensional Metrology, National Physical Laboratory, Hampton Road, Teddington, Middlesex 2. Doiron, T., & Beers, J. S. (1995). The Gage Block Handbook. US Department of Commerce, Technology Administration, National Institute of Standards and Technology. 3. Howarth, P., Redgrave, F., Germany, P. T. B., Madsen, S., & Grafisk, S. (2008). "metrology—in short" 3rd edition. EURAMET project, 1011. 4. AIAG-Work Group, Measurement Systems Analysis, MSA 4th edition – Reference manual, Daimler Chrysler Corporation, Ford Motor Company, General Motors Corporation, June, (2010). 5. VDA, VDA volume 5 Capability of Measurement Process, 2nd edition, (2011) 6. Dr.Drégelyi-Kiss Ágota - Galla Jánosné: Mérés technika, BGK - 3046 (e-jegyzet), 2011 <p><i>Quality Assurance:</i> using feedback provided by the students for improving content and methods of teaching of the subject.</p>

Budapest, 09 Januar, 2018

Ágota Drégelyi-Kiss, PhD
Lecturer instructor