ELECTRONIC MEASUREMENT AND INSTRUMENTATION

1	Course Title:	ELECTRONIC MEASUREMENT AND INSTRUMENTATION
2	Course Code:	EEM4103
3	Type of Course:	Optional
4	Level of Course:	First Cycle
5	Year of Study:	4
6	Semester:	7
7	ECTS Credits Allocated:	4.00
8	Theoretical (hour/week):	2.00
9	Practice (hour/week):	2.00
10	Laboratory (hour/week):	0
11	Prerequisites:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Dr. Ögr. Üyesi ABDURRAHMAN GÜNDAY
15	Course Lecturers:	-
16	Contact information of the Course Coordinator:	E-posta:agunday@uludag.edu.tr Tel: (224) 294 2018 Adres: Elektrik - Elektronik Mühendisliği Bölümü 3. Kat, No: 304
17	Website:	
18	Objective of the Course:	The aim is to make general definitions about measurement, to give information and theoretical studies about calibration methods of measuring instruments, measurement methods, counters, ADCs and transducers.
19	Contribution of the Course to Professional Development:	Learning electrical measurement techniques.
20	Learning Outcomes:	
	1	Learns general information about measurement.
	2	Knows measurement methods.
	3	Knows the errors caused by the device during the measurements and the correction of the errors that occur.
	4	Knows the working principles of analog and digital measuring instruments.
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21	Course Content:	

Course Content:

Week	Theoretical	Practice
1	Basic concepts of measurement (accuracy, sensitivity, sensibility, deviation, standard deviation)	
2	Types of errors and their analysis	
3	Measurable values of electrical signals (peak, average, effective)	

4	DC and AC current and voltage measurements	
5	Measurement of power	
6	Measurement of energy	
7	Digital measurement devices	
8	Midterm exam + Review	
9	Ampermeter and Voltmeter loading effect, relative error	
10	Instrumentation amplifiers	
11	Temperature, pressure, mechanical stress and force measurement	
12	Biomedical sensors	
13	Application examples	
14	Final + Review	

22	Textbooks, References and/or Other Materials:	1. A. Bodur, C. Gerçek, G. Dinçer, Her Yönüyle Enstrümantasyon ve Ölçme, Bileşim Yay., 2001. 2. W. Bolton, Electrical and Electronic Measurement and Testing, Longman Scientific & Technical, 1993.

23 Assesment

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		Measurement and evaluation are performed according to the Rules & Regulations of Bursa Uludağ University on Undergraduate Education.

24 **ECTS / WORK LOAD TABLE**

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	14	2.00	28.00
Self study and preperation	12	5.00	60.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	2.00	2.00
Others	0	0.00	0.00
Final Exams	1	2.00	2.00
Total Work Load			122.00
Total work load/ 30 hr			4.00
ECTS Credit of the Course			4.00

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**