INDUSTRIAL CONTROL SYSTEMS AND MEASUREMENT

1	Course Title:	INDUSTRIAL CONTROL SYSTEMS AND MEASUREMENT
2	Course Code:	MAK4030
3	Type of Course:	Optional
4	Level of Course:	First Cycle
5	Year of Study:	4
6	Semester:	8
7	ECTS Credits Allocated:	3.00
8	Theoretical (hour/week):	2.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Dr. Ögr. Üyesi GÜRSEL ŞEFKAT
15	Course Lecturers:	Yok
16	Contact information of the Course Coordinator:	E-Posta: sefkat@uludag.edu.tr Tel: 0 224 294 19 86 Posta Adresi: U.Ü., Müh.–Mim. Fakültesi, Makine Müh. Bölümü, 16150 Görükle/Bursa
17	Website:	http://www20.uludag.edu.tr/~mtd/Mak4030.htm
18	Objective of the Course:	To give information theoretical and practical about Industrial Control Systems and measurement which used in engineering field and to prepare at profession in this field.
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	

	1	Understanding of industrial control systems.
	2	To design and analysis control system on time domain
	3	To apply the state-space approach to the design of the control system.
	4	To design and analysis control system on frequency domain
	5	Recognize measurement tools used in engineering.
	6	To understand the working principles of measurement systems and instruments
	7	Choose the measuring instrument to be used in experimental studies.
	8	
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21	Course Content:	
	Course Content:	
Week	Theoretical	Practice
1	Introduction	
2	Conventional Control Methods	
3	Industrial Control Systems	

4	Industrial Control Systems Components and working principle	
5	Modeling methods of Control System	
6	The design and analysis Control systems.	
7	Measurement Systems	
8	Size measurement techniques and the measurement of the size.	
9	Sensors and the elements of the transducer.	
10	Repeating courses and midterm exam	
11	Capacitive and inductive transducer and application examples	
12	The measurement of the force, torque and shaft power.	
13	The measurement of the surface roughness.	
14	Introduction to microprocessor controlled measuring and control mechanisms.	

22	Textbooks, References and/or Other Materials:	1.Yüksel I., Automatic Control, System Dynamic and Control Systems, (In Turkish), U.Ü. Vipaş AŞ, 2001 2.Ogata K., Modern Control Engineering, Second E., Prentice-Hall Inc., 1990 3.Kutman H., H., Industrial Electronic, Birsen Publish. Ltd. Şti., Istanbul, 1998
23	Assesment	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	0	0.00	0.00
Field Study	14	1.00	14.00
Homeworks	2	6.00	12.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	10.00	10.00
Others	5	2.00	10.00
Final Exams	1	15.00	15.00
Total Work Load			89.00
Total work load/ 30 hr			2.97
ECTS Credit of the Course			3.00

Quiz 1 10.00 Contribution of Term (Year) Learning Activities to Success Grade 50.00

Laboratory and preperation 1 50.00 Contribution of Final Exam to Success Grade 50.00

Measurement and Evaluation Techniques Used in the Course

24 ECTS / WORK LOAD TABLE

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	4	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	3	3	0	1	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	3	3	0	1	0	0	0	0	0	0	0	0	0	0	0
ÖK4	0	3	3	0	1	0	0	0	0	0	0	0	0	0	0	0

ÖK5	0	0	0	3	4	0	0	0	0	0	0	0	0	0	0	0
ÖK6	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
ÖK7	0	0	0	0	4	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**