MODERN CHARACTERIZATION METHODS IN ENGINEERING APPLICATION

1	Course Title:	MODERN CHARACTERIZATION METHODS IN ENGINEERING APPLICATION	
2	Course Code:	TEK5039	
3	Type of Course:	Optional	
4	Level of Course:	Second Cycle	
5	Year of Study:	1	
6	Semester:	1	
7	ECTS Credits Allocated:	6.00	
8	Theoretical (hour/week):	3.00	
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:	Prof. Dr. MEHMET ORHAN	
15	Course Lecturers:	Yok	
16	Contact information of the Course Coordinator:	morhan@uludag.edu.tr Tel. +90.0.224.294 20 64 Adres: Bursa Uludağ Üniversitesi Mühendislik Fakültesi Tekstil Mühendisliği Bölümü 16059 Nilüfer Bursa, Türkiye.	
17	Website:		
18	Objective of the Course:	The general objective in this course is to give knowledge about the basic principles, machines, applications, and uses of the modern analysis methods for textiles.	
19	Contribution of the Course to Professional Development:	Students will learn about modern analysis methods for textiles.	
20	Learning Outcomes:		
		1	The student will be able to define and explain the basic principles, approaches, and concepts of the modern analysis methods.
		2	The student will be able to define and explain the running principles of the analysis devices and to recognize the basic parts of them.
		3	The student will be able to compare the analysis devices and methods.
		4	The student will be able to use and run the analysis devices.
		5	The student will be able to analyze and to evaluate the data by statistically and mathematically.
		6	The student will be able to select which analysis method would be appropriate for any textile sample.
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21	Course Content:		
	Course Content:		

Week	Theoretical	Practice
1	Classification of Analytical Techniques, Classical Methods of Quantitative Analysis and Selection of Analytical Methods	
2	Introduction of Spectroscopy, General Terms Used in Spectroscopy, Properties of Electromagnetic Radiation, Interaction of Light and Matter	
3	Spectroscopic Methods, Spectroscopy Equipment and Basic Components	
4	Theory, Devices and Applications of Molecular UV-Visible Spectroscopy	
5	Theory, Devices and Applications of Atomic Absorption Spectroscopy	
6	Theory, Devices and Applications of Flame and Electrothermal Atomic Absorption Spectroscopy	
7	Theory, Devices and Applications of Atomic Emission Spectroscopy	
8	Theory, Devices and Applications of Infrared Spectroscopy	
9	Theory, Devices and Applications of Raman Spectroscopy	
10	Theory, Devices and Applications of Molecular Fluorescence, Phosphorescence, Chemiluminescence Spectroscopy	
11	Theory, Devices and Applications of Nuclear Magnetic Resonance Spectroscopy	
12	Theory, Devices and Applications of Mass Spectroscopy	
13	Theory, Devices and Applications of Mass	
14	Investigation of The Other Analytical Techniques	
22	Textbooks, References and/or Other Materials:	1.Orhan M., Lecture Notes, 2021. 2.Crompton T.R., Characterization of Polymers, Volume 1, Publisher Marcel Dekker Inc, s.631, 1995. 3.Raheel M., Modern Textile Characterization Methods, Publisher Marcel Dekker Inc, s.631, 1995. 5.Cheremisinoff, N.P., Polymer Characterization Laboratory Techniques and Analysis, s.255, 1996. Polymer Synthesis Characterization- A Laboratory Manual, s.231, 1998. Instrumental Analysis, Sixth Edition, s.1107, 2005. 8.Williams D.H., Fleming I., Spectroscopic Methods in Organic Chemistry, 2008. 9.Criddle W.J., Ellis G.P., Spectral and Chemical Characterization of Organic Compounds, 3. ed. John Wiley and Sons 1990.
23	Assesment	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	6.00	84.00
Homeworks	1	14.00	14.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	20.00	20.00
Others	0	0.00	0.00
Final Exams	1	20.00	20.00
Total Work Load			180.00
Total work load/ 30 hr			6.00
ECTS Credit of the Course			6.00

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Midterm Exam	1	30.00
Quiz	0	0.00
Home work-project	1	10.00
Final Exam	1	60.00

Total	3	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		It is done with written exams (Midterm, Homework, and Final).

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	3	0	2	0	0	0	2	0	0	0	0	0	0	0	4
ÖK2	4	3	0	2	0	0	0	2	0	0	0	0	0	0	0	4
ÖK3	3	3	2	2	2	3	0	0	0	0	3	0	0	2	0	4
ÖK4	3	3	0	4	3	0	0	0	0	0	0	0	0	0	0	4
ÖK5	3	3	0	3	4	0	0	0	0	0	0	0	0	3	0	4
ÖK6	4	4	0	2	3	3	0	0	0	0	3	2	3	3	0	4
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	**1 very low**		**2 low**			**3 Medium**			**4 High**			**5 Very High**				