X-RAYSDIFRACTIONS

1	Course Title:	X-RAYSDIFRACTIONS
2	Course Code:	FZK5326
3	Type of Course:	Optional
4	Level of Course:	Second Cycle
5	Year of Study:	1
6	Semester:	2
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:	Solid State Physics
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Doç. Dr. MÜRŞİDE ŞAFAK HACIİSMAİLOĞLU
15	Course Lecturers:	Dr. Öğr. Üyesi M. Cüneyt HACIİSMAİLOĞLU
16	Contact information of the Course Coordinator:	Doç. Dr. Mürşide HACIİSMAİLOĞLU msafak@uludag.edu.tr, (0224) 2941697, Fen Edebiyat Fakültesi, Fizik Bölümü 16059 Görükle Kampüsü Bursa
17	Website:	
18	Objective of the Course:	To learn the X-Ray Diffraction (XRD) technique to be able to make structural analysis of crystal materials using this technique.
19	Contribution of the Course to Professional Development:	Learning X-ray diffraction (XRD) techniques for solid materials and analyzing structurally crystal solids.
20	Learning Outcomes:	
	1	Learning the nature and properties of X-rays.
	2	Learning X-ray diffraction in crystals.
	3	Learning the X-ray diffraction techniques.
	4	Learning the structural analysis of crystal materilas using XRD technique.
	5	Learning the elemental analysis of materials
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21	Course Content:	

Course Content:

Week	Theoretical	Practice
1	Properties of X-rays	
2	Interaction of X-ray with Matter	
3	X-Ray Diffraction (XRD)	
4	Diffraction Techniques	
5	Intensity Calculations	
6	Preferred Directions	

7	Diffraction in Polycrystals	
8	Diffraction in Single Crystals	
9	Structural analysis of Macrocrystals	
10	Structural analysis of some materials Midterm Exam	
11	Structural analysis of Microcrystals	
12	X-ray Fluorescence analysis	
13	X-ray microprobe analysis	
14	Structural and elemental analysis of some samples	

22	Textbooks, References and/or Other Materials:	1. B. D. Cullity Elements of X-Ray Diffraction, , Addison-Wesley Publishing Company, INC. (Reading, MA 1978). 2. Elton N. Kaufmann Characterization of Materials, , Vol. 2, John Wliey&Sons, Inc., (New Jersey, 2003).
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	0	0.00
Quiz	0	0.00
Home work-project	10	30.00
Final Exam	1	70.00
Success Grade		100.00
Contribution of Final Exam to Success Grade		70.00
Total		100.00

24 ECTS / WORK LOAD TABLE			
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	10	5.00	50.00
Projects	0	0.00	0.00
Course			
Field Studies	0	0.00	0.00
Midterm exams	0	0.00	0.00
Others	0	0.00	0.00
Final Exams	1	2.00	2.00
Total Work Load			178.00
Total work load/ 30 hr			5.93
ECTS Credit of the Course			6.00

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	0	0	0	4	4	0	0	0	3	0	4	0	0	0	0	0
ÖK2	0	4	3	0	0	0	0	0	0	0	4	0	0	0	0	0
ÖK3	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	3	3	3	0	0	0	0	0	3	0	0	0	0	0	0	0

ÖK5	3	4	3	0	0	0	0	0	3	0	4	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**