Code and Name:	**FİZ5680 SPIN DYNAMICS AND NMR APPLICATIONS**
Unit:	Graduate School of Natural and Applied Sciences
Detail:	**Period:** 2023-2024 **Status:** Optional **Class:** 1 **Credits:** 2-2-0-3 **ECTS:** 6 **Language:** Turkish

INSTRUCTOR

Title, Name and Surname:	
Phone:	
Email:	
Social Account:	-
Student Day and Time:	

COURSE ASSISTANT

Title, Name and Surname:	.....
Phone:	.....
Email:	.....
Social Account:	.....
Student Day and Time:	.....

Lessons Weekly Program:	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			-			

Rendering: Face-to-face lessons per week 4 It will be done on an hourly basis.
Place: **YY:** - **UE:** -

Purpose: This course covers the basic principles of nuclear physics and quantum mechanics, covering topics such as uncoupled and coupled spins, superposition states, spin operations, and radio frequency applications. With a particular focus on nuclear magnetic resonance (NMR) spectroscopy, it aims to provide an in-depth understanding of molecular and atomic structures through the study of non-interacting and interacting spin systems, experiments on quadroscopic nuclei, AX systems and multiple spin systems. The course is designed to provide an understanding of the mechanisms of motion and relaxation at the molecular and atomic level in the field of nuclear physics.

Material: 1. Nuclear Magnetic Resonance Spectroscopy . Metin Balcı
2.Principles of Nuclear Magnetic Resonance in One and Two Dimensions. Richard R. Ernst, Geoffrey Bodenhausen, and Alexander Wokaun

Student Responsibility : Participation in classes and exams.

Weekly Lesson Plan

Week	Topic	Method
1	Unpaired Spins	YY
2	Superposition States	YY
3	Spin Process	YY
4	Radio Frequencies	YY
5	Spin Community	YY
6	Experiments on Non-Interacting Spins	YY
7	Experiments on Non-Interacting Spins	YY
8	Quadroscopic Nucleus	YY
9	Doubled Spins	YY
10	Experiments on AX Systems	YY
11	Experiments on AX Systems	YY
12	Multiple Spin Systems	YY
13	Movement and Relaxation	YY
14	Movement and Relaxation	YY

Assessment and Evaluation

	Method		Number	Weight
Break Exam	Exam	Face	1	% 50
	Quiz	-	-	-
	Homework		-	-
	Project		-	-
General Exam	Face		1	% 50

Course Outcomes:

1	Students It will enable them to understand physical phenomena at the atomic and molecular level T. S.
2	It will teach students the basic principles, applications, and various techniques of NMR spectroscopy, providing them with practical skills in this field.
3	Analysis of spin dynamics and interactions in complex systems will improve students' analytical thinking and problem-solving abilities.
4	Students will gain the ability to interpret data obtained through NMR spectroscopy and other experimental techniques.
5	It will teach students advanced concepts such as movement and relaxation, as well as how to conduct experiments on non-interacting and interacting spin systems, providing them with a hands-on understanding of these complex topics.

Course-Specific Explanations:

UE: Distance Education; **YY:** Face-to-Face Education