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|---|---|
| **Code and Name:** | **FİZ5320 STATISTICAL MECHANICS** |
| **Unit:** | Graduate School of Natural and Applied Sciences |
| **Detail:** | **Period:** 2023-2024 **Status:** Optional **Class:** 1 **Credits:** 3-0-0-3 **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 3 It will be done on an hourly basis.**

**Place:** **YY:** - **UE:** -

**Purpose:** **To understand the relationship between microscopic and macroscopic systems in explaining the thermal and energy properties of atoms assembled in terms of microscopic properties.**

**Material:** **R. K. Pathria, Statistical Mechanic, 1997; F. Schwabl, Statistical Mechanics, 2006; W. Greiner at al., Thermodynamics and Statical Mechanics,1994.**

**Student Responsibility :** **Conducting preparation and research before and after the lecture.**

**Weekly Lesson Plan**

| Week | Topic | Method |
|---|---|---|
| 1 | Basic Concepts in Statistical Physics; Laws of Thermodynamics, Justifications of the Statistical Approach | YY |
| 2 | Macro and Micro Situations, Statistical Weight of a Macro State | YY |
| 3 | Statistical Equilibrium of an Isolated System | YY |
| 4 | Statistical Sets | YY |
| 5 | Microcanonical Set, Gibbs Contradiction, Microcanonical Set in Ideal Gases and Harmonic Oscillators | YY |
| 6 | Einstein Model in Microcanonical Sets | YY |
| 7 | Distribution Function | YY |
| 8 | Einstein and Debye Model in a Canonical Set | YY |
| 9 | MIDTERM EXAM | YY |
| 10 | Statistical Mechanics of Gases, Ideal Gases with Atoms | YY |
| 11 | Diatomic Ideal Gases, Codivision Theorem | YY |
| 12 | Real Gases, Maxwell Boltzman Speed Distribution | YY |
| 13 | Maxwell-Boltzman, Fermi-Dirac and Bose-Einstein Distribution Functions in Ideal Systems | YY |
| 14 | Application Areas of Statistical Physics | YY |

**Assessment and Evaluation**

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

**Course Outcomes:**

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|---|---|
| 1 | Learns about classical statistics. |
| 2 | Learns to determine the properties of matter with the help of statistical sets. |
| 3 | Learns the application and interpretation of statistical relations to ideal systems. |
| 4 | Will be able to use the knowledge gained in statistical physics in other areas of physics such as Nuclear Physics, Solid State Physics, Atomic and Molecular Physics |
| 5 | |

**Course-Specific Explanations:**

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