

THERMODYNAMICS

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| 1 | Course Title: | THERMODYNAMICS |
| 2 | Course Code: | FZK2405 |
| 3 | Type of Course: | Optional |
| 4 | Level of Course: | First Cycle |
| 5 | Year of Study: | 2 |
| 6 | Semester: | 3 |
| 7 | ECTS Credits Allocated: | 5.00 |
| 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: | Doç. Dr. SEZER ERDEM |
| 15 | Course Lecturers: | |
| 16 | Contact information of the Course Coordinator: | serdem@uludag.edu.tr, 0 224 2941772, Uludağ Üniversitesi, Fen-Edebiyat Fakültesi, Fizik Bölümü, Görükle Kampüsü, 16059 Nilüfer/Bursa |
| 17 | Website: | |
| 18 | Objective of the Course: | Basic information about the thermodynamics is given and the laws of thermodynamics are taught to the students. |
| 19 | Contribution of the Course to Professional Development: | Understanding the basic topics of Thermodynamics course, associating with current issues and explaining. |
| 20 | Learning Outcomes: | |
| | 1 | Learn the basic concepts of thermodynamics and the relations between these concepts. |
| | 2 | Learn the difference between heat and temperature. |
| | 3 | Learn the relationship among the pressure, volume and temperature of a gas. |
| | 4 | Learn the laws of thermodynamics and apply them to the problems. |
| | 5 | Have knowledge about heat engines. |
| | 6 | Learn the concept of entropy and the application of it to the thermodynamic processes. |
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| 21 | Course Content: | |
| | Course Content: | |
| Week | Theoretical | Practice |
| 1 | Basic Concepts of Thermodynamics | |
| 2 | Temperature and Heat | |
| 3 | The Zeroth Law of Thermodynamics | |
| 4 | Thermal Expansion of Solids and Liquids | |

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| 5 | Ideal Gases | |
| 6 | Thermal Energy and Heat Flow | |
| 7 | First Law of Thermodynamics | |
| 8 | Applications of First Law of Thermodynamics | |
| 9 | Midterm exam + General Review | |
| 10 | Second Law of Thermodynamics | |
| 11 | Carnot Cycle | |
| 12 | Heat Machines | |
| 13 | Entropy | |
| 14 | Third Law of Thermodynamics | |

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| 22 | Textbooks, References and/or Other Materials: | <p>1. Physics for Scientists and Engineers, Raymond A. SERWAY, Robert J. Beichner.</p> <p>2. Physics for Scientists and Engineers, Paul M. FISBANE, Stephen GASIOROWICZ, Stephen T. THORNTON.</p> <p>3. Sears and Zemansky's University Physics, Hugh D. YOUNG, Roger A. FREEDMAN.</p> |
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| 23 | Assesment | |
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| TERM LEARNING ACTIVITIES | | NUMBER | WEIGHT | | |
|----------------------------------------------------|---|--------|--------------|-----------------|------------------------|
| Activites | | | Number | Duration (hour) | Total Work Load (hour) |
| Theoretical | | | 14 | | |
| Final Exam | 1 | | 60.00 | 3.00 | 42.00 |
| Practicals/Labs | | | 0 | 0.00 | 0.00 |
| Self study and preparation | | | 12 | 3.00 | 36.00 |
| Contribution of Term (Year) Learning Activities to | | | 40.00 | | |
| Homeworks | | | 10 | 3.00 | 30.00 |
| Projects | | | 0 | | |
| Contribution of Final Exam to Success Grade | | | 60.00 | 0.00 | 0.00 |
| Field Studies | | | 0 | 0.00 | 0.00 |
| Midterm exams | | | 1 | 2.00 | 2.00 |
| Measurement and Evaluation Techniques Used in the | | | Classic exam | | |
| Others | | | 13 | 3.00 | 39.00 |
| Final Exam | | | 1 | 2.00 | 2.00 |
| ECTS / WORK LOAD TABLE | | | | | |
| Total Work Load | | | | | 151.00 |
| Total work load/ 30 hr | | | | | 5.03 |
| ECTS Credit of the Course | | | | | 5.00 |

| 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 | 5 | 4 | 3 | 0 | 0 | 4 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ÖK2 | 5 | 3 | 3 | 0 | 0 | 4 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ÖK3 | 5 | 4 | 4 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ÖK4 | 5 | 5 | 5 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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| ÖK5 | 4 | 3 | 3 | 0 | 0 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ÖK6 | 4 | 4 | 4 | 0 | 0 | 3 | 0 | 0 | 4 | 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 | | | |