| Course Information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Course Code** | **T** | **P** | **L** | **C** | **ECTS** | **Type** C/E | **Language** TR/ENG etc. | **Year/Semester** |
| FİZ4008 | **3** | **0** | **0** | **3** | **5** | **E** | **TR** | **4/SPRING** |
| **Course Name (**Turkish**)** | Katıhâl Elektroniği | | | | | | | |
| **Course Name (**English**)** | Solid State Electronics | | | | | | | |

| | |
|---|---|
| **Unit/Program** | Physics Department/Undergraduate Program |
| **Course Prerequisite** | No |
| **Course Objectives** | To provide an understanding of experimental physics and electronic techniques used in modern instruments<br>To provide an understanding of the basics of electronic circuits and elements |
| **Course Outline** | Semiconductor materials, semiconductor diode, diode properties and equivalent circuits, zener diode,<br>LED and other special-purpose diodes, diode applications |
| **Textbook/ Material / Resources** | 1. Solid State Electronic Devices, B. G. Streetman, S. K. Banerjee, 6th Edition, Prentice Hall, 2006<br>2. Electronic Devices and Circuit Theory; Robert L. Boylestad, Louis Nashelsky, Prentice Hall,1982. |
| **Internship Status** | No |

**Course Precedents**

| **University Name** | **Program Name** | **Course Name** | **T-P-L-C; ECTS** | **Type** |
|---|---|---|---|---|
| **Istanbul Technical University (ITU)** | **Physics/Physics Engineering** | **Solid State Electronics** | **3-0-0-3; 4** | **E** |
| **Necmettin Erbakan University** | **Electrical and Electronics Engineering** | **Solid State Electronics** | **3-0-0-3; 5** | **C** |
| | | | | |

| **The instructor who proposed the course (** Title, Name and Surname) | *Signature* |
|---|---|
| | |
| **Instructors who can teach the course** (Title, Name and Surname) | *Signature* |
| | |
| | |

**Academic justification for the opening of the course?** (The effect of course outcomes on program outcomes, etc.)

**Brief explanation of the course** (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

Face-to-face courses will be taught under the supervision of the relevant faculty member.

**External Stakeholder Opinions About** the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)

| **Stakeholder Name** | **Opinion** (It should be given as a summary, it should not exceed two lines.) |
|---|---|
| | |
| | |

| Weekly Course Content Distribution | | |
|---|---|---|
| **Week** | **Theory** | **Application/Laboratory** |
| **1** | Impure Semiconductors, Electron and Hol Concentration in Thermal Equilibrium | |
| **2** | Fermi Levels in Semiconductors | |
| **3** | Sudden Discontinuities in P-N Joints | |
| **4** | Joint Diode | |
| **5** | Time-Dependent Behaviors in Joint Diode | |
| **6** | Zener Diode, Basic Diode | |
| **7** | Solar Cells | |
| **8** | Joint transistor, Currents in Joint Transistors | |
| **9** | Midterm Exam | |
| **10** | Transistor amplifiers, field effect transistors | |
| **11** | Transistor Technology | |
| **12** | Compression of bundles with magnetic field, resonance cavities | |
| **13** | Plasma Oscillations, Porametric Amplifiers | |
| **14** | Massers, Lasers | |
| **15** | Final Exam | |
| **16** | | |

| Assessment | | | |
|---|---|---|---|
| **Evaluation Criteria** | **Activity** | **Custom** | **Contribution to Success Grade (%)** |
| | Midterm Exams | 1 | 40 |
| | Quizzes | | |
| | Assignments | | |
| | Projects | | |
| | Term Paper | | |
| | Laboratory | | |
| | Other | | |
| | Final Exam | 1 | 60 |
| | | **Sum:** | 100 |
| **Remarks** | | | |

| | | |
|---|---|---|
| **Content Design and Subject Weight (%)** | Mathematics and Basic Sciences | 60 |
| | Engineering Sciences | 40 |
| | Social Sciences | |
| | Health Sciences | |
| | Educational Sciences | |
| | Culture and Art Sciences | |
| | Design Information | |

| Workload (ECTS) Calculation | | | |
|---|---|---|---|
| **Events** | **Number** | **Duration (Hours)** | **Total workload (Hours)** |
| Fieldwork | | | |
| Midterm Exam Application | 1 | 2 | 2 |
| Self-Study (including pre-class and exam preparation) | 14 | 2 | 28 |
| Make-up Exam | 1 | 2 | 2 |
| Experiment and Observation | | | |
| Class Participation (Theory) | 14 | 3 | 42 |
| Homework | | | |
| Final Exam Practice | 1 | 2 | 2 |
| Laboratory | | | |
| Article Review | | | |
| Writing an Article | | | |
| Reading | | | |
| Case Study | | | |
| Performance | | | |
| Problem Solution | | | |
| Project Preparation | | | |
| Project Submission | | | |
| Quiz | | | |
| Report Preparation | | | |
| Submitting Reports | | | |
| Role/Drama Work | | | |
| Seminar | | | |
| Oral Exam | | | |
| Team/Group Work | 12 | 3 | 36 |
| Argument | 14 | 1 | 14 |
| Application/Practice | | | |
| Other | | | |
| **TOTAL WORKLOAD:** | | | **126** |
| **ECTS CREDİTS OF THE COURSE:** *(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)* | | | **5** |

| **Program Outcomes (PO)** / **Learning Outcomes (LO)** *(Course Outcomes)* | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | Learn the structure of semiconductor elements and how they work | **5** | **5** | **5** | **4** | **3** | **3** | **4** | **5** | **5** | **3** | **1** |
| **2** | It can predict the importance and functioning of semiconductor elements in an electronic camel | **5** | **5** | **5** | **4** | **3** | **3** | **4** | **5** | **5** | **3** | **1** |
| **3** | Know how semiconductor circuit elements are manufactured | **5** | **5** | **5** | **4** | **3** | **3** | **4** | **5** | **5** | **3** | **1** |

**Organizer:** Prof. Dr. Fahrettin YAKUPHANOĞLU
**Preparation Date:** 20.05.2024