

| Fizik Bölümü / PHYSICS /                                |   |          |          |            |         |      |
|---|---|----------|----------|------------|---------|------|
| Course Code   | Course Name   | Teorical | Practice | Laboratory | Credits | ECTS |
| FZK-3035  | Basic of Nuclear Engineering  | 3.00     | 0.00     | 0.00       | 3.00    | 6.00 |
| Course Detail   |   |          |          |            |         |      |
| <b>Course Language</b>                                  | : Turkish   |          |          |            |         |      |
| <b>Qualification Degree</b>                             | : Bachelor  |          |          |            |         |      |
| <b>Course Type</b>                                      | : Optional  |          |          |            |         |      |
| <b>Preconditions</b>                                    | : Not   |          |          |            |         |      |
| <b>Objectives of the Course</b>                         | : Principles of Nuclear Engineering, nuclear engineering education with the main topics of the reactor physics, reactor technology, reactor safety, health physics, radiation physics and technology as well as all of the issues discussed as parts of a whole, is a lesson to the students formation of general nuclear engineering aims to gain them.  |          |          |            |         |      |
| <b>Course Contents</b>                                  | : Basic radiation physics, radiation technology. Nuclear reactor systems and types; basic reactor physics, criticality calculations; fuel cycles; reactivity changes; reactor kinetics. Instrumentation and control; radiation protection. Reactor materials; shielding; energy removal. Reactor safety; economics. Waste management. Reactor design.   |          |          |            |         |      |
| <b>Recommended or Required Reading</b>                  | : J.R. and Baratta, A.J., Introduction to Nuclear Engineering, Lamarsh, 3rd Edition, Prentice-Hall. Lamarsh, J.R. , Introduction to Nuclear Engineering, Addison-Wesley Company, 2nd Edition, 1983. Foster, A.r., R.L. Wright, Jr., Basic Nuclear Engineering, 3rd Ed., Boston, Mass: Allyn and Bacon,1977 Roland Allen Knief, Nuclear Engineering: Theory and Technology of Commercial Nuclear Power, Taylor & Francis; ISBN: 1560320893; 2nd edition, August 1992 |          |          |            |         |      |
| <b>Planned Learning Activities and Teaching Methods</b> | : Oral lecture, questions-answers, homework   |          |          |            |         |      |
| <b>Recommended Optional Programme Components</b>        | : --  |          |          |            |         |      |
| <b>Instructors</b>                                      | : Prof. Dr. Emine Dilara Atalay   |          |          |            |         |      |
| <b>Instructor's Assistants</b>                          | : --  |          |          |            |         |      |
| <b>Presentation Of Course</b>                           | : Face to face / Online   |          |          |            |         |      |

| Course Outcomes                                       |  |
|---|--|
| <b>Upon the completion of this course a student :</b> |  |
| 1   | After completion of this course students will be able to: have general knowledge in the field of nuclear engineering |
| 2   | Understand nuclear fission.  |
| 3   | Get knowledge about the basics of nuclear physics.   |
| 4   | Understand nuclear reactors principles.  |
| 5   | Get knowledge about applications of nuclear reactors.  |

| Preconditions |             |          |          |            |         |      |
|---------------|-------------|----------|----------|------------|---------|------|
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| Weekly Contents |   |                                     |            |                  |   |
|-----------------|---|-------------------------------------|------------|------------------|---|
|                 | Teorical  | Practice                            | Laboratory | Preparation Info | Teaching Methods                            |
| 1.Week          | *Fundamental and modern physics concepts              |                                     |            |                  | *Oral lecture, questions-answers, homework. |
| 2.Week          | *Atomic/nuclear models                                |                                     |            |                  |   |
| 3.Week          | *Nuclear energetics                                   |                                     |            |                  |   |
| 4.Week          | *Radioactivity  |                                     |            |                  |   |
| 5.Week          | *Nuclear reactions                                    |                                     |            |                  |   |
| 6.Week          | *Radiation interactions with matter                   |                                     |            |                  |   |
| 7.Week          |   | *Radiation interactions with matter |            |                  |   |
| 8.Week          | *Detection and measurement of radiation               |                                     |            |                  |   |
| 9.Week          | *Radiation doses and hazard assessment                |                                     |            |                  |   |
| 10.Week         | *Principles of nuclear reactors                       |                                     |            |                  |   |
| 11.Week         | *Nuclear power  |                                     |            |                  |   |
| 12.Week         | *Methods for converting nuclear energy to electricity |                                     |            |                  |   |
| 13.Week         | *Nuclear technology in industry and research          |                                     |            |                  |   |
| 14.Week         | *Medical applications of nuclear technology           |                                     |            |                  |   |

| Assesment Methods % |                |
|---------------------|----------------|
| 1                   | Mıæ : 30.000   |
| 2                   | Ödev : 10.000  |
| 3                   | Final : 60.000 |

