

## 1. Course Description

| COURSE DESCRIPTION FORM                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |                        |  |
|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------------|--|
| Course Code and Title                                                                                                         | CHE460 PETROLEUM TREATMENT TECHNOLOGY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |                        |  |
| Course Semester                                                                                                               | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |                        |  |
| Catalog Description (Content) of the Course                                                                                   | Formation, production and composition of crude oils. Refinery operations. Crude oil distillation, hydro-treating, refining, catalytic cracking, lube oil units etc. Refinery wastes.                                                                                                                                                                                                                                                                                                                                         |          |                        |  |
| Main Textbook                                                                                                                 | Hengstebeck, R.J., "Petroleum Processing", McGraw Hill, 1989.<br>•Kuleli, Ö., "Petrol Arıtım Teknolojisi", Çağlayan Kitabevi, 1981. •Yorulmaz, Y., "Petrol İşleme Teknolojisi ve Rafineri Üniteleri" ODTÜ Müh.Fak. Yayın No:71, 1983                                                                                                                                                                                                                                                                                         |          |                        |  |
| Supporting Textbooks                                                                                                          | Hengstebeck, R.J., "Petroleum Processing", McGraw Hill, 1989.<br>•Kuleli, Ö., "Petrol Arıtım Teknolojisi", Çağlayan Kitabevi, 1981. •Yorulmaz, Y., "Petrol İşleme Teknolojisi ve Rafineri Üniteleri" ODTÜ Müh.Fak. Yayın No:71, 1983                                                                                                                                                                                                                                                                                         |          |                        |  |
| Course Credit (ECTS)                                                                                                          | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |                        |  |
| Prerequisites of the Course (Compulsory attendance should be indicated here.)                                                 | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |                        |  |
| Type of the Course                                                                                                            | Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |                        |  |
| Instruction Language of the Course                                                                                            | English                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |                        |  |
| Object and Target of the Course                                                                                               | To introduce the basic processes of petroleum treatment technology.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |          |                        |  |
| Learning Outcomes of the Course                                                                                               | 1. Knowledge access to any research<br>2. Individual ability to work                                                                                                                                                                                                                                                                                                                                                                                                                                                         |          |                        |  |
| Mode of Delivery                                                                                                              | Face to face                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |                        |  |
| Weekly Schedule of the Course                                                                                                 | 1. Week : Formation, production and composition of petroleum<br>2. Week: Structure of refinery and its processes<br>3-4. Week: Distillation of crude oil<br>5. Week: Naphta hydrogenation unit<br>6-7. Week: Cracking and catalytical cracking<br>8. Week: Cracking and catalytical cracking<br>9-10. Week: Reforming and other oxidizing processes<br>11. Week: Facilities and finishing processes<br>12. Week: Production of lubricating oil, waxes and asphalts<br>13. Week: Refinery wastes<br>14. Week: Refinery wastes |          |                        |  |
| Educative Activities<br>(Credit will be determined based on the time given for these activities. Should be filled carefully.) | Theoretical Study Hours of Course Per Week<br>Mid-Term and Studying for Mid-Term<br>Final and Studying for Final                                                                                                                                                                                                                                                                                                                                                                                                             |          |                        |  |
| Assessment Criteria                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Quantity | Total Contribution (%) |  |
|                                                                                                                               | Midterm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2        | 60                     |  |
|                                                                                                                               | Homework                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0        | 0                      |  |
|                                                                                                                               | Assignment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0        | 0                      |  |
|                                                                                                                               | Projects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0        | 0                      |  |
|                                                                                                                               | Practice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0        | 0                      |  |
|                                                                                                                               | Quiz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0        | 0                      |  |
|                                                                                                                               | Contribution of In-term Studies to Overall Grade                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          | 60                     |  |
|                                                                                                                               | Contribution of Final Examination to Overall Grade                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          | 40                     |  |
|                                                                                                                               | Attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |          |                        |  |

| Workload of the Course | Activity                                   |                                                                                                                                                                                                                  | Total Week Count | Weekly Duration (in hour) | Total Workload in Semester |   |   |  |  |
|------------------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------|----------------------------|---|---|--|--|
|                        | Theoretical Study Hours of Course Per Week |                                                                                                                                                                                                                  | 12               | 3                         | 36                         |   |   |  |  |
|                        | Mid-Term and Studying for Mid-Term         |                                                                                                                                                                                                                  | 2                | 20                        | 40                         |   |   |  |  |
|                        | Final and Studying for Final               |                                                                                                                                                                                                                  | 1                | 20                        | 20                         |   |   |  |  |
|                        | Total work load                            |                                                                                                                                                                                                                  |                  |                           | 96                         |   |   |  |  |
|                        | Total work load/25                         |                                                                                                                                                                                                                  |                  |                           | 3.84                       |   |   |  |  |
|                        | ECTS of the course                         |                                                                                                                                                                                                                  |                  |                           | 4                          |   |   |  |  |
|                        | Number                                     | Program Outcomes                                                                                                                                                                                                 | 1                | 2                         | 3                          | 4 | 5 |  |  |
|                        | 1                                          | Adequate knowledge of engineering subjects; ability to use theoretical areas to model and solve                                                                                                                  |                  |                           |                            | X |   |  |  |
|                        | 2                                          | Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.                                                       |                  |                           | X                          |   |   |  |  |
|                        | 3                                          | Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose. |                  |                           | X                          |   |   |  |  |
|                        | 4                                          | Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively.                                                          |                  |                           | X                          |   |   |  |  |
|                        | 5                                          | Ability to design and conduct experiments, gather data,                                                                                                                                                          |                  |                           | X                          |   |   |  |  |

|  |    |                                                                                                                                                                                     |  |   |   |  |  |  |
|--|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---|---|--|--|--|
|  |    | analyze and interpret results for investigating engineering problems.                                                                                                               |  |   |   |  |  |  |
|  | 6  | Ability to work efficiently in intra-disciplinary teams.                                                                                                                            |  | X |   |  |  |  |
|  | 7  | Ability to work efficiently in multi-disciplinary teams;                                                                                                                            |  |   | X |  |  |  |
|  | 8  | Ability to work individually.                                                                                                                                                       |  | X |   |  |  |  |
|  | 9  | Ability to communicate effectively in Turkish/English, both orally and in writing; Ability to write effective reports and comprehend written reports, make effective presentations, |  |   | X |  |  |  |
|  | 10 | prepare design and production reports, give and receive clear and intelligible instructions.                                                                                        |  |   | X |  |  |  |
|  | 11 | Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.             |  |   | X |  |  |  |
|  | 12 | Awareness of professional and ethical responsibility.                                                                                                                               |  | X |   |  |  |  |
|  | 13 | Information about business life practices such as project management, risk management, and change management.                                                                       |  |   | X |  |  |  |
|  | 14 | Information                                                                                                                                                                         |  | X |   |  |  |  |

