| | | | |
|---|---|---|---|
| **Identification** | **Subject** | CHE 400 Refinery and petrochemical products 4 ECTS | |
| | **Department** | Chemistry and Chemical Engineering | |
| | **Program** | Undergraduate | |
| | **Term** | Fall 2023 | |
| | **Instructor** | Valida Aliyeva | |
| | **E-mail:** | valiyeva@khazar.org | |
| | **Phone** | +994 50 995 40 04 | |
| | **Classroom/hours** | 101 N/ 15-20-16.50 | |
| **Prerequisites** | | | |
| **Language** | English | | |
| **Compulsory/Elective** | Compulsory | | |
| **Required textbooks and course materials** | Petroleum Refining Processes, Author -James G. Speight, Copyright 2002 [1] Petroleum Refining, Technology and Economics, 4th Edition, Author- James H. Gary, Glenn E. Handwerk Publisher- Marcel Dekker Inc, Copyright 2001 [2] | | |
| **Teaching methods** | **Lecture** | **X** | |
| | **Group discussion** | **X** | |
| | **Research from internet** | **X** | |
| | **Others** | **X** | |

| | | | |
|---|---|---|---|
| **Evaluation** | **Methods** | **Date/deadlines** | **Percentage (%)** |
| | **Participation** | Every week | 10 |
| | **Quiz** | Week 3, 10, 13 | 15 |
| | **Midterm Exam** | Week 7 | 20 |
| | **Presentation/Group work** | Week 3-15 | 15 |
| | **Final Exam** | | 40 |
| | **Total** | | 100 |

| | |
|---|---|
| **Course outline** | The methods, technology, and goods used in the petroleum refining and petrochemical sectors are thoroughly explained in this course. Students will investigate how refinery and petrochemical products are made, how quality is monitored, and how environmental factors are taken into account. Furthermore in this course the students will learn the basic principles of technological process units, potentially important oil-gas products and their specifications in Petrochemical and as well as for Refinery plants. |
| **Course objectives** | ▪ After completing the course, students ought to be able to:<br>▪ Recognize the fundamentals of petrochemical and petroleum refining processes.<br>▪ Describe the various petrochemical and refinery products, along with their uses.<br>▪ Examine these industries' environmental and safety practices. |

| | |
|---|---|
| | ▪ Examine the industry's present developments and difficulties.<br>▪ Apply fundamental ideas to real issues in petrochemical and refinery operations. |
| **Learning outcomes** | ▪ Recognize the primary development pathways for petroleum products and specialty polymers, as well as the various participants.<br>▪ Recognize the key product attributes, market developments, and outlook for petrochemical and refinery facilities.<br>▪ Describe the key operational characteristics for each process unit, including their chemical and technological components.<br>▪ Recognizing the phases of project development and project deliverables<br>▪ Establishing a safety culture inside the business |
| **Policy** | ▪ **Participation**<br>Actively participating in class discussions, asking questions, and contributing to group activities can enhance your understanding of complex concepts. It allows you to clarify doubts, exchange ideas, and learn from your peers and the instructor.<br>▪ **Quiz**<br>Quizzes are a form of assessment that helps instructors gauge students' understanding of key concepts and topics. They provide a quick snapshot of whether students have grasped the material presented in lectures or readings.<br>▪ **Presentation/Group work**<br>The refinery and petrochemical industry often involves collaborative projects and presentations in a professional setting. Engaging in group work and presentations during the class helps students develop skills that are directly transferable to their future careers.<br>▪ **Withdrawal (pass/fail)**<br>The School of Science and Engineering grading guidelines are carefully adhered to throughout this course. In order to pass, a student must typically receive a mark of at least 60%. If the student fails, the course.<br>▪ **Cheating/plagiarism**<br>Any form of plagiarism or cheating on a test, quiz, or project will result in the cancellation of the assignment. In this scenario, the student will receive a score of zero (zero) without any further consideration.<br>▪ **Professional behavior guidelines**<br>During class hours, students are expected to conduct themselves in a way that fosters a positive academic and professional atmosphere. Discussions without permission and unethical conduct are absolutely forbidden.<br>▪ **Ethics**<br>In class, students shouldn't be late. During class, all electronic devices must be put away and turned off. |

| | **Tentative Schedule (Can be changed)** | |
|---|---|---|
| **Weeks** | **Topics** | **Reference books** |

| | | |
|---|---|---|
| 1 | Introduction | [1] |
| 2 | Refinery Products | [2], [1] |
| 3 | Refinery Feedstocks | [2], [1] |
| 4 | Thermophysical Properties of Petroleum Fractions and Crude Oils | [1] |
| 5 | Crude Distillation | [1], [2] |
| 6 | Catalytic Reforming and Isomerization | [1], [2] |
| 7 | **Mid Exam** | |
| 8 | Thermal Cracking and Coking | [1], [2] |
| 9 | Hydroconversion | [1] |
| 10 | Fluidised Catalytic Cracking | [1], [2] |
| 11 | Clean fuels | [1], [2] |
| 12 | Alkylation and polymerization | [1], [2] |
| 13 | Safety in Petroleum Refineries | [1] |
| 14 | Environmental Aspects in Refining | [1] |
| 15 | Review | |
| **Final Exam** | | |