Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

# Academic Program and Course Description Guide

## Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus.

Its main goal is to improve and build graduates' skills so they are ready for the job market.

The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External examiner program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

## Academic Program Description Form

**University Name**: Al-farabi university college .

**Faculty/Institute**: Al-farabi

**Scientific Department**: Oil and Gas refining department .

**Academic or Professional Program Name**: B.SC in chemical engineering .

**Final Certificate Name**: B.SC in chemical engineering .

**Academic System**: Yearly .

**Description Preparation Date**: 1-9-2023 .

**File Completion Date**: 2-5-2024 .

**Signature**:

**Head of Department Name**:

**Date**: 2/5/2024

**Signature**:

**Scientific Associate Name**:

**Date**: 2. 5. 2024

**The file is checked by**:

**Department of Quality Assurance and University Performance**

**Director of the Quality Assurance and University Performance Department**:

**Date**: 02/05/2024 Dr. Khalidah Al-Qayim

**Signature**:

**Approval of the Dean**

prof. Dr. Ahmed Gailan

| 1. **Program Vision** |
| --- |
| An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable. |

| 2. **Program Mission** |
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| Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions. |

| 3. **Program Objectives** |
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| The educational program of Petroleum and Gas Refinery Engineering program are to produce graduate who:-<br>1- Achieve a successful graduated with a broad knowledge in refinery, petrochemicals, gas industries and other related processes.<br><br>2- Integrate academic preparation with Petroleum and Gas Refinery Engineering technology developments<br><br>3- Work effectively in a team environment and well communicate with other professional collages |

| 4. **Program Accreditation** |
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| The program is recognized by the sectorial authority in the Ministry of Higher Education and Scientific Research. |

| 5. **Other external influences** |
|---|
| Twining with the University of Technology/College of Engineering / Department of Chemical Engineering / Oil and Gas Branch. |

| 6. **Program Structure** | | | | |
|---|---|---|---|---|
| **Program Structure** | **Number of Courses** | **Credit hours** | **Percentage** | **Reviews*** |
| **Institution Requirements** | 2 | 3 | 10 | – |
| **College Requirements** | 8 | 3 | 60 | – |
| **Department Requirements** | 4 | 2 | 30 | – |
| **Summer Training** | – | – | – | – |
| **Other** | – | – | – | – |

* This can include notes whether the course is basic or optional.

## 7.Program Description

| Credit Hours | | Course Name | Course Code | Year / level |
|---|---|---|---|---|
| Practical | Theoretical | | | |
| - | 2 | Technical English I | RES.111 | First Year / First Semester |
| - | 3 | Mathematics I | RES.121 | |
| - | 3 | Chemical Engineering Principles I | RES.131 | |
| 2 | 2 | Chemistry | RES.123 | |
| - | 2 | Physics | RES.125 | |
| 2 | 1 | Engineering Drawing | RES.127 | |
| 2 | 1 | Computer Programming I | RES.113 | |

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|---|---|---|---|---|
| 6 | - | Workshop I | RES.129 | |
| - | 2 | Technical English II | RES.112 | First Year Second Semester |
| - | 3 | Mathematics II | RES.122 | |
| - | 3 | Chemical Engineering Principles II | RES.132 | |
| 2 | 2 | Chemistry of Petroleum | RES.124 | |
| - | 3 | Engineering Mechanics | RES.126 | |
| 2 | 1 | AutoCAD | RES.114 | |
| 1 | 1 | Electrical Technology | RES.128 | |
| 6 | - | Workshop II | RES.1210 | |
| - | 2 | Human Rights | RES.115 | |
| - | 3 | Engineering Mathematics I | RES.221 | Second Year / First Semester |
| - | 3 | Energy Balance | RES.231 | |
| 2 | 3 | Fluid Flow I | RES.233 | |
| 2 | 2 | Physical Chemistry I | RES.235 | |
| 2 | 3 | Computer Programming II | RES.211 | |
| - | 3 | Materials Eng. I | RES.223 | |
| 2 | 2 | Properties of Petroleum fuels | RES.237 | |
| - | 1 | Democracy | RES.213 | |
| - | 3 | Engineering Mathematics II | RES.222 | Second Year / Second Semester |
| - | 3 | Material & Energy Balance | RES.232 | |
| 2 | 3 | Fluid Flow II | RES.234 | |
| - | 2 | Physical Chemistry II | RES.236 | |
| 2 | 2 | Computer Programming III | RES.212 | |
| 2 | 3 | Materials Eng. II | RES.224 | |
| - | 2 | Properties of Petroleum | RES.238 | |
| 2 | 3 | Eng. Statistics | RES.225 | |
| 2 | 3 | Thermodynamics I | RES.331 | Third Year / First Semester |
| 2 | 3 | Numerical Analysis | RES.321 | |
| 2 | 3 | Mass Transfer | RES.333 | |
| - | 2 | Chemical Reaction Kinetics | RES.335 | |
| - | 3 | Heat Transfer I | RES.337 | |
| - | 2 | Combustion | RES.339 | |

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|---|---|---|---|---|
| - | 3 | Chemicals from Petroleum | RES.3311 | |
| - | 3 | Equipment Design | RES.3313 | |
| - | 3 | Thermodynamics II | RES.332 | Third Year / Second Semester |
| - | 3 | Applied Mathematics in chemical Engineering | RES.322 | |
| - | 3 | Unit Operation I | RES.334 | |
| - | 3 | Reactor Design | RES.336 | |
| 2 | 3 | Heat Transfer II | RES.338 | |
| - | 2 | Petroleum and Gas Field Processing | RES.3310 | |
| 2 | 3 | Petroleum Refinery Eng. I | RES.3312 | |
| 2 | 3 | Equipment, Storage Design Using CAD | RES.3314 | |
| 2 | 1 | Project I | RES.421 | Fourth Year / First Semester |
| 2 | 3 | Unit Operations II | RES.431 | |
| - | 3 | Process Dynamics | RES.433 | |
| - | 3 | Petroleum Refinery Eng. II | RES.435 | |
| - | 3 | Refinery Management and Ethics | RES.423 | |
| - | 3 | Heterogeneous Reactor & Catalyst | RES.437 | |
| - | 3 | Environment Pollution & Safety in Petroleum | RES.438 | |
| 2 | 1 | Project II | RES.422 | Fourth Year / Second Semester |
| - | 3 | Unit Operations I I I | RES.432 | |
| 2 | 3 | Process Control and Instruments for Petroleum Refinery | RES.434 | |
| - | 2 | Petroleum Refinery Economics | RES.436 | |
| - | 3 | Optimization | RES.424 | |
| - | 2 | Corrosion Eng. in Petroleum Refinery | RES.439 | |

| 8.Expected learning outcomes of the program | |
|---|---|
| **Knowledge** | |
| Learning Outcomes 1 | 1- An ability to distinguish, identifies, define, formulate, and solve engineering problems by applying principles of engineering, science and mathematics.<br>2- An ability to perceive the continual necessity for professional knowledge growth and how to find access, assemble and apply it properly.<br>3- An ability to skillfully communicate orally with a gathering of people and in writing with various managerial levels.<br>4- An ability to work adequately on teams and to set up objectives, plane activities, meet due dates, and manage risk and uncertainty.<br>5- An ability to perceive ethical and professional responsibilities in engineering cases and make brilliant judgments taking into account the sequences in worldwide financial. |
| **Skills** | |
| Learning Outcomes | 1- Conduct basic and applied engineering and scientific research on the development of new, safer, and economic way to refine and study operation included in the oil and gas refinery and power production<br>2- Integrate the scientific and engineering knowledge to design and conduct experiments and analyze data<br>3- Apply scientific and engineering fundamentals to formulate solution to petroleum and natural gas refinery engineering<br>4- Using technique, skills, and modern petroleum and natural gas engineering tools. |
| | |
| **Ethics** | |
| Learning Outcomes | 1- An ability to recognize ethical and professional responsibilities in engineering |

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|---|---|
| | situation and make informed judgment, which must consider the impact of engineering solution in global, economic and social contexts.<br>2- Recognize the necessity of protecting the environment and keeping it as save as possible by preventing the pollution via production development and exploration operation.<br>3- Identify the importance of working as a team and exchange the experience and information to reach the optimal work results. |

| 9.Teaching and Learning Strategies |
|---|
| 1- Oral discussion<br>2- Reports<br>3- Presenting videos<br>4- Seminar and presentations<br>5-Competition groups Classroom discussions<br>6-Oral elevation<br>7-Written exam<br>8-Group discussion<br>9-Reflective learning practices<br>10-Effective note taking and note making strategies<br>11-Impactful and engaging lectures<br>12-Using power point presentations<br>13-Making classroom alive with debate<br>14-Developing the student's ability to generate ideas and evidence<br>15-Providing students the opportunity to learn through real-life work experiences |

## 10.Evaluation methods

Students are evaluated by direct discussion , written exams , oral exams ,monthly exams , and reports.

## 11.Faculty

**Faculty Members**

| Academic Rank | Specialization | | Special Requirements/Skills (if applicable) | Number of the teaching staff | |
|---|---|---|---|---|---|
| | General | Special | | Staff | Lecturer |
| Prof.Dr. Abd al Fattah Mohamed ali | Chemical engineering | Fliud mechanics | | * | |
| Prof .Dr. Walid Mohamed salih | = | Transport phenomena | | * | |
| Assist. Prof Saleem Mohamed obaid | = | Oil and gas refining | | * | |
| Luc.Dr. Khalid abd ali | = | Engineering materials | | * | |
| Luc. Dr. khalidah abd al khaliq | = | Energy engineering | | * | |
| Luc. Dr. kifaa fadhel | Chemistry science | Oil lubrication and additives | | * | |
| assist. prof. Muna yossif | = | Chemical reaction engineering | | * | |
| Assist. luc. Rawnak adnan | = | Oil and gas refining | | * | |

| | | | | |
|---|---|---|---|---|
| Assist. Luc. Lamees raad | = | Chemical engineering | * | |
| Assist. Luc. Durgam kassim | = | Chemical engineering operations | * | |
| Assist. Luc. Ridaa nisar | = | Chemical engineering | * | |
| Assist. Luc. Taha siham | = | = | * | |
| Assist. Luc. Zainab Mohamed | = | = | * | |
| Luc. Dr. wissam abd alsattar | = | Oil refineries | | * |
| Luc. Dr. Thaer adnan | = | Operation control | | * |
| Assist. luc. Ruaa nadhem | = | Chemical engineering | | * |
| Assist. Luc. Maha allawi | = | = | | * |

| **Professional Development** |
|---|
| **Mentoring new faculty members** |
| 1- Determining the point in students education (e.g., courses, laboratories, and internships) at which he/she should develop the specified knowledge, skills and areas<br>2- Recognize how these skills and abilities are transferable to other contexts (including work and professional contexts)<br>3- Workshop and resources focusing on particular academic skills area (for example essay-writing, presentation skills, or managing his/her dissertation)<br>4- Improve the student employability and plane for his/her future career. |

| Professional development of faculty members |
| --- |
| 1- Determining the point in students education (e.g., courses, laboratories, and internships) at which he/she should develop the specified knowledge, skills and areas<br>2- Recognize how these skills and abilities are transferable to other contexts (including work and professional contexts)<br>3- Workshop and resources focusing on particular academic skills area (for example essay-writing, presentation skills, or managing his/her dissertation)<br>4- Improve the student employability and plane for his/her future career. |

**12.Acceptance Criterion**

The enrollment og the chemical engineering program is central through ministry of higher education and scientific research by admitting the students graduated from the scientific baccalaureate branch.

| 13.The most important sources of information about the program |
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| 1- Files saved in the section<br>2- The curriculum approved by the Ministry of Higher Education and Scientific Research<br>3- Recommendations of the quality and academic performance committees<br>4- The official website of Al-Farabi University College<br>http://www.alfarabiuc.edu.iq |

## 14.Program Development Plan

**A.** Create a communicative group for the academic staff with a head of the educational program in order to discuss and solve all the challenges that face the development of the educational system.

**B.** Facilitate the educational labs with latest technological equipment and facilitate the educational institution with a network to enhance the E- Learning processes.

**C.** Attract an academic staff from authentic universities to raise the level of the

19 learing quality.

**D.**Support the lectures with recording videos created by the instructor to be available for the review purposes for the students.

**E.** Provide the library with rich references that convey the student with the latest scientific approaches

| Program Skills Outline | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Please tick the boxes corresponding to the individual learning outcomes under evaluation | | | | | | | | | | | | | | | |
| | | | | Required program learning outcomes | | | | | | | | | | | | | | | |
| General and transferable skills (other skills related to employability and personal (development | | | | Ethics | | | | Skills | | | | Knowledge Goals | | | | Basic /Optional | Course Name | Course Code | Year/level |
| D4 | D3 | D2 | D1 | C4 | C3 | C2 | C1 | B4 | B3 | B2 | B1 | A4 | A3 | A2 | A1 | | | | |
| | | ✓ | ✓ | | ✓ | | | | | | | | ✓ | | | | Technical English I | RES.111 | First Year / First Semester |
| ✓ | ✓ | | | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | Mathematics I | RES.121 | |
| ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | Chemical Engineering Principles I | RES.131 | |
| ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | Chemistry | RES.123 | |
| ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | ✓ | ✓ | | Physics | RES.125 | |

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| | ✓ | | | | ✓ | | | | ✓ | | | | ✓ | ✓ | | | Engineering Drawing | RES.127 | |
| | | ✓ | ✓ | | | | | ✓ | | | | | ✓ | | ✓ | | Computer Programming I | RES.113 | |
| | | ✓ | | | | | | | ✓ | | | | | | ✓ | | Workshop I | RES.129 | |
| | | | ✓ | ✓ | | | | | | | | ✓ | | | | | Technical English II | RES.112 | First Year / Second Semester |
| | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | ✓ | | Mathematics II | RES.122 | |
| | | ✓ | ✓ | ✓ | | | ✓ | ✓ | | ✓ | | | ✓ | | ✓ | | Chemical Engineering Principles II | RES.132 | |
| | | ✓ | | | ✓ | | | ✓ | | ✓ | ✓ | | | | ✓ | | Chemistry of Petroleum | RES.124 | |
| | | | | | | | | | | | ✓ | | ✓ | | | | Engineering Mechanics | RES.126 | |
| | | | ✓ | ✓ | | | ✓ | | | | ✓ | | | ✓ | ✓ | | AutoCAD | RES.114 | |
| | ✓ | | | | | | | | | | | | | | | | Electrical Technology | RES.128 | |
| | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | | ✓ | | Workshop II | RES.1210 | |

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| | | | | ✓ | | | | | | | | ✓ | | | | | Human Rights | RES.115 | |
| | | ✓ | | | ✓ | | | | ✓ | | | | ✓ | | | ✓ | Engineering Mathematics I | RES.221 | Second Year / First Semester |
| ✓ | | | ✓ | | ✓ | | ✓ | | | | ✓ | | | ✓ | | | Energy Balance | RES.231 | |
| | | ✓ | | ✓ | | | ✓ | | | ✓ | | | ✓ | | | ✓ | Fluid Flow I | RES.233 | |
| ✓ | | ✓ | | | ✓ | | | ✓ | | ✓ | | | ✓ | | ✓ | | Physical Chemistry I | RES.235 | |
| | | | ✓ | | | ✓ | | | ✓ | | | ✓ | | | ✓ | | Computer Programming II | RES.211 | |
| | | ✓ | | | | ✓ | | ✓ | | ✓ | | | | ✓ | | | Materials Eng. I | RES.223 | |
| | | ✓ | ✓ | | | ✓ | | | | | | ✓ | ✓ | | | | Properties of Petroleum fuels | RES.237 | |

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| | | ✔ | | | ✔ | | | | | | | ✔ | | | | Democracy | RES.213 | |
| | | | | ✔ | | ✔ | | ✔ | | | ✔ | | ✔ | | | Engineering Mathematics II | RES.222 | Second Year / Second Semester |
| | | | ✔ | | ✔ | | | | ✔ | | ✔ | ✔ | | ✔ | | Material & Energy Balance | RES.232 | |
| | | | | | ✔ | | ✔ | | | | ✔ | | | | | Fluid Flow II | RES.234 | |
| | | | | | | | | | | | | | | ✔ | | Physical Chemistry II | RES.236 | |
| | | | | ✔ | | | ✔ | | | | ✔ | | ✔ | | | Computer Programming III | RES.212 | |
| | | | | | ✔ | | | ✔ | | | | | ✔ | | | Materials Eng. II | RES.224 | |
| | | ✔ | | | ✔ | | | ✔ | | | ✔ | | | ✔ | | Properties of Petroleum | RES.238 | |

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| | | | | | ✓ | | | ✓ | | ✓ | | | | Eng. Statistics | RES.225 | |
| | | | ✓ | | | ✓ | ✓ | | ✓ | | ✓ | ✓ | | Thermodynamics I | RES.331 | Third Year / First Semester |
| | | ✓ | | | ✓ | | | ✓ | | | ✓ | | | Numerical Analysis | RES.321 | |
| | ✓ | | ✓ | | ✓ | | | | | ✓ | | ✓ | | Mass Transfer | RES.333 | |
| | | | ✓ | | | ✓ | | | ✓ | | ✓ | | | Chemical Reaction Kinetics | RES.335 | |
| | ✓ | | ✓ | | ✓ | | | | ✓ | | | | | Heat Transfer I | RES.337 | |
| | | | | ✓ | | | ✓ | | | | ✓ | | | Combustion | RES.339 | |
| | | ✓ | | | ✓ | | | ✓ | | | ✓ | ✓ | | Chemicals from Petroleum | RES.3311 | |
| | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | Equipment Design | RES.3313 | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ✓ | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | | ✓ | | | | Thermodynamics II | RES.332 |
| ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | | Applied Mathematics in chemical Engineering | RES.322 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | Unit Operation I | RES.334 |
| ✓ | ✓ | ✓ | ✓ | | | ✓ | | | ✓ | | | | ✓ | | | | Reactor Design | RES.336 |
| ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | | ✓ | | | Heat Transfer II | RES.338 |
| | ✓ | | | ✓ | | | ✓ | | | | | | ✓ | | ✓ | | Petroleum and Gas Field Processing | RES.3310 |
| ✓ | | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | Petroleum Refinery Eng. I | RES.3312 |
| ✓ | | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | Equipment, Storage Design Using CAD | RES.3314 |

Third Year / Second Semester

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| | | | | | ✓ | | ✓ | ✓ | ✓ | | ✓ | | | ✓ | ✓ | ✓ | Unit Operations II | RES.431 | Fourth Year / First Semester |
| ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | ✓ | | | ✓ | | ✓ | Process Dynamics | RES.433 | |
| ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | Petroleum Refinery Eng. II | RES.435 | |
| ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | Refinery Management and Ethics | RES.423 | |
| ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | Heterogeneous Reactor & Catalyst | RES.437 | |
| ✓ | | | ✓ | | | | | ✓ | | | | ✓ | | ✓ | | ✓ | Environment Pollution & Safety in Petroleum | RES.438 | |

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| ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | Project II | RES.422 | Fourth Year / Second Semester |
| ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | Unit Operations I I I | RES.432 | |
| ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | Process Control and Instruments for Petroleum Refinery | RES.434 | |
| ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | ✓ | Petroleum Refinery Economics | RES.436 | |
| ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | Optimizatio n | RES.424 | |
| ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | Corrosion Eng. in Petroleum Refinery | RES.439 | |