**2020- 2021**



**Chemical Engineering Program Report**

**فصول دراسية**

**Program Report for B.Sc.**

**Chemical Engineering Program**

**Program Report**

# Program Report 2020/2021

# Bachelor of Science in chemical Engineering

**Academic Year: (2020 -2021)**

## A- Basic Information

1. Program Title: **B. Sc.**
2. Program Type: **Single**
3. Department(s): **chemical Engineering**
4. Program Duration: **A minimum of 5 years (including one year of preparatory year)**
5. Co-ordinator: **Prof. Dr. Hend Elsayed Gadow**
6. External Evaluator:
7. Year of Operation: **2020-2021**
8. Last date of program specifications approval: **October 2020**
9. Base of Examination Committee formulation: is formulated from 2 faculty members and suggested by the academic department based on the area of specialization for each course.
10. External Examiners System: **Available (Especially in Project)**

## B- Statistics

1. Total number of students in the program (2020-2021): **56**
2. No. of students starting the program (First year: 2020-2021): **56**
3. No. of students in second year (2020-2021): **-**
4. No. of students in the third year (2020-2021): **-**
5. No. of students starting fourth year (2020-2021): **-**
6. No. of students completed and graduated from the program (2020-2021): **-**
7. No. of students completing and graduated from the program (Fourth year) and as a percentage of those who started in fourth year (2020-2021): **-**
8. The enrollment trend of students attributed to the numbers enrolled during the last 3 years: -

The beginning of students’ enrollment in the program (the beginning of the trend)

1. No. and percentage of students passing in each year: **Table A**
2. Grading: numbers and percentages in each grade: **Table B**

**Table A: The Number and percentage of students passing in the program (2020- 2021)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Academic level** | **First Year 2020-2021** | **Second Year 2020-2021** | **Third Year 2020-2021** | **Fourth Year**  **2020-2021** |
| **No. of Attending student** | **56** | **-** | **-** | **-** |
| **No. of Attending passing** | **48** | **-** | **-** | **-** |
| **Percentage** | **85.71%** | **-** | **-** | **-** |

**Table B: Number and Percentage of students in each Grade (2020-2021) (% from the**

**total students completed the year)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Academic level** | **Excellent** | | **V. Good** | | **Good** | | **Passed** | | **Passed with Courses** | | **Failed** | |
| **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** |
| **First Year** | **1** | **1.79** | **15** | **26.79** | **12** | **21.43** | **1** | **1.79** | **19** | **33.93** | **8** | **14.29** |
| **Second Year** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **Third Year** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **Fourth Year** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |

**Commentary**

Closer look to Table (B) **reversal** the following notes:

The good result indicates in the table. The main reason behind this is due to:

1. The high level of the teaching stuff in this program.
2. The high level of the accepted students in this program.
3. The students’ skills and awareness during the program.

**1. First destinations of graduates**

Percentages of the graduating cohort who have:

1. Proceeded to appropriate employment: (N/A)
2. Proceeded to other employment: (N/A)
3. Undertaken postgraduate study: (N/A)
4. Engaged in other types of activity: (N/A)
5. Unknown first destination: (N/A)

## C- Academic Standards

1. **Achievement of program intended learning outcomes**

| **A. Compulsory** | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Level** | **Semester** | **Code** | **Course Name** | **Hours per week** | | | **Competencies** | **Program**  **LO’S** |
| **Lec.** | **Lab.** | **Exer.** |
| **LEVEL 0** | **SEMESTER 1** | BAS011 | Mathematics 1 | 2 | - | 2 | A1 | a1, b1, a3 |
| BAS012 | Mechanics 1 | 2 | - | 2 | A1 | a1, b1, a2 |
| BAS013 | Physics 1 | 2 | 2 | 2 | A1 | a1, b1, a2 |
| BAS014 | Engineering Chemistry | 2 | 2 | - | A1 | a1, c2, c3 |
| A10 | d2 |
| BAS015 | Engineering drawing and projection | 1 | - | 2 | A1 | a1, b1, a2, b2 |
| BAS016 | Int. to computer systems | 2 | 2 | - | A1 | c2, c3 |
| A5 | b1 |
| **Total** | | **11** | **8** | **8** |  |  |
| **SEMESTER 2** | BAS021 | Mathematics 2 | 2 | - | 2 | A1 | a1, b1, a3, b3 |
| BAS022 | Mechanics 2 | 2 | - | 2 | A1 | a1, b1, a2, c1 |
| BAS023 | Physics 2 | 2 | 2 | 2 | A1 | a1, b2, a2, a3 |
| BAS024 | Production engineering | 3 | 2 | - | A3 | c1, c2 |
| A5 | a1,b1,c1,d1 |
| A6 | a1, c2 |
| A9 | d1,d2,d3 |
| BAS025 | Int. to Engineering and environment | 2 | - | - | A3 | a2, a3, b1, c1 |
| A4 | a1 |
| A10 | d1,d2 |
| B2 | d1 |
| BAS026 | Technical English Language 1 | 1 | - | 2 | A8 | d1 |
| BAS027 | Human Rights | 2 | - | - | A8 | d1 |
| **Total** | | **15** | **6** | **6** |  |  |
| **LEVEL 1** | **SEMESTER 1** | BAS111 | Mathematics 3 | 2 | - | 2 | A1 | a1, a2, a3, b1 |
| BAS112 | Electrical Engineering Fundamental | 3 | - | 2 | A1 | a1, a2,b1,b2,c1,c2 |
| A2 | a1, b3,b4,c1 |
| BAS113 | Engineering Thermodynamics | 3 | - | 2 | A1 | a1, a2, a3, b1, b2  , c1,c2 |
| BAS114 | Technical English Language 2 | 2 | 2 | - | A8 | d1,d2 |
| A10 | d1,d2 |
| BAS115 | Computer programming | 2 | 2 | - | A2 | a1,b3,c1 |
| A5 | a1,b1, c1,d1 |
| A7 | d1,d2,d3 |
| A8 | d1,d2 |
| CHE111 | Inorganic Chemistry | 2 | 2 | - | A2 | a2, b2, c2 |
| A7 | d2 |
| **Total** | | **14** | **6** | **6** |  |  |
| **SEMESTER 2** | BAS121 | Mathematics 4 | 2 | - | 2 | A1 | a1,a2,a3,b1,c1 |
| BAS122 | Technical Report Writing | 2 | 2 | - | A5 | a1,a2,b1,b2,c1,d1 |
| A8 | d1,d2 |
| BAS123 | Int. to Information Technology | 2 | - | 2 | A4 | a2, a3, c3 |
| A8 | d1, d2 |
| BAS124 | Strengthen of materials | 2 | - | 2 | A1 | a1, b1, c2, c3 |
| CHE121 | Organic Chemistry | 2 | 2 | - | A2 | a1,b1 |
| A6 | b1 |
| A7 | d1,d2,d3 |
| B1 | a1, b1, c1 |
| CHE122 | Physical Chemistry | 2 | 2 | - | A5 | a1,c1,d1 |
| A6 | b1 |
| A7 | d1,d2,d3 |
| B1 | a1,b1 |
| **Total** | | **12** | **6** | **6** |  |  |
| **LEVEL 2** | **SEMESTER 1** | BAS211 | Engineering Probability and Statistics | 2 | - | 2 | A1 | a1, a2, b1, b3, c2 |
| BAS212 | Fluid Mechanics | 2 | 1 | 1 | A1 | a1, a2, b1, b2, b3 |
| A2 | a1, a2, b1 |
| BAS213 | Engineering Economy | 2 | - | 1 | A3 | a1, a2, b1, c1 |
| A4 | a2,b1,c2 |
| BAS214 | Heritage of Egyptian  Literature | 2 | - | - | A9 | d1,d3 |
| CHE211 | Chemical Eng. principles 1 | 2 | - | 2 | A9 | d1, d2 |
| A10 | d1 |
| CHE212 | Material science and  metallurgy | 2 | - | 2 | A7 | d2,d3 |
| A10 | d1,d2 |
| B2 | d1 |
| CHE213 | Principles of Eng. Design | 2 | - | 2 | A5 | a1,b1,d1 |
| A9 | d1,d2,d3 |
| A10 | d2 |
| B2 | d1 |
| **Total** | | **14** | **1** | **10** |  |  |
| **SEMESTER 2** | BAS221 | Numerical Methods in Engineering | 2 | - | 2 | A1 | a1, a2, b1, b2, c1, c2 |
| CHE221 | Chemical Eng. Principles2 | 3 | - | 2 | A2 | b4, c1, c3 |
| A3 | b1, c2 |
| B1 | a1 |
| B3 | d1 |
| CHE222 | Chemical Engineering  Thermodynamics | 2 | 1 | 2 | A1 | a1, a2, b1 |
| B1 | a1, b1, c1 |
| CHE223 | Analytical Chemistry | 2 | 2 | - | A2 | b2,b3 |
| A6 | a1, b1, c2 |
| A9 | d2,d3 |
| B3 | d1 |
| CHE224 | Process Dynamics and  Control | 2 | - | 2 | A2 | c1 |
| A4 | a3 |
| A6 | b1, c2 |
| B3 | d1 |
| CHE225 | Heat transfer | 2 | 1 | 2 | A2 | b3,c2,c3 |
| A10 | d1,d2 |
| B4 | d1 |
| CIE 226 | Training 1 \* | - | - | - | A5 | a1,b1 |
| A7 | d1, d2, d3 |
| A8 | d1, d2 |
| B1 | b1, c1 |
| **Total** | | **15** | **4** | **8** |  |  |
| BAS311 | Environmental  management | 2 | - | 1 | A3 | a2, a3, b1, c1 |
| A4 | a1, c1, c3 |
| A10 | d1 |
| **LEVEL 3** | **SEMESTER 1** | CHE311 | Reactor Design | 2 | - | 2 | A6 | a1, b1, c1 |
| B1 | a1, c1 |
| CHE312 | Operations Research | 2 | - | 2 | A2 | a1, b3 |
| A3 | a2,b1,c2 |
| A6 | b1, c2 |
| CHE313 | Mass Transfer Operations I | 2 | - | 2 | B1 | a1, b1, c1 |
| B2 | d1 |
| CHE314 | Bio chemistry | 2 | - | 2 | A2 | a1 |
| A4 | a3 |
| A5 | b1,d1 |
| B1 | a1, b1 |
| CHE315 | Electrochemistry | 2 | 1 | 1 | A10 | d1,d2 |
| B2 | d1 |
| B4 | d1 |
|  |  | CHE316 | Elective 1 | 2 | - | 2 | A3 | a1,b1,c1 |
| A9 | d1,d2,d3 |
| B2 | d1 |
| **Total** | | **14** | **1** | **12** |  |  |
| **SEMESTER 2** | BAS321 | Project Management and Control | 2 | - | 2 | A4 | a2, b1, c2 |
| A6 | a1,b1 |
| A8 | d1 |
| CHE321 | Mass Transfer Operations II | 3 | - | 2 | A7 | d1, d2, d3 |
| B1 | b1, c1 |
| CHE322 | Corrosion engineering | 2 | - | 2 | A4 | b1,c1 |
| A10 | d1,d2 |
| B2 | d1 |
| B4 | d1 |
| CHE323 | Mechanical unit operations | 3 | - | 2 | A3 | a1, b1, c1 |
| A5 | c1, d1 |
| B1 | a1, b1, c1 |
| CHE324 | Process Modeling and  Simulation | 3 | 2 | - | A2 | a2, b3, b4 |
| B3 | d1 |
| CHE325 | Elective 2 | 2 | - | 2 | B1 | a1,b1,c1 |
| B2 | d1 |
| CHE326 | Training 2\* | - | - | - | A5 | c1, d1 |
| A10 | d1, d2 |
| B2 | d1 |
| **Total** | | **14** | **2** | **10** |  |  |
| **LEVEL 4** | **SEMESTER 1** | CHE411 | Computer Applications in  Chem. Eng. | 3 | - | 2 | B1 | a1, b1, c1 |
| B3 | d1 |
| CHE412 | Petrochemical Engineering | 2 | - | 2 | B1 | a1, b1, c1 |
| B2 | d1 |
| CHE413 | Plant Design | 3 | - | 2 | A9 | d1, d2, d3 |
| B1 | a1, b1, c1 |
| B3 | d1 |
| B4 | d1 |
| CHE414 | Project 1\* | 3 | 2 | - | A2 | c1, c2, c3 |
| A3 | c1, c2 |
| A5 | c1, d1 |
| A6 | b1, c1, c2 |
| CHE415 | Elective 3 | 2 | - | 2 | B2 | d1 |
| B4 | d1 |
| CHE416 | Elective 4 | 2 | - | 2 | A4 | a1,c1,c3 |
| B1 | b1,c1 |
| **Total** | | **15** | **2** | **10** |  |  |
| **SEMESTER 2** | BAS421 | Research and Analytical skills | 2 | - | - | A2 | b3,c3 |
| CHE421 | Industrial Technology in Chem. Eng. | 2 | - | 2 | A3 | a2, a3, b1, c1 |
| B1 | a1, b1, c1 |
| CHE422 | Petroleum Refining  Engineering | 2 | - | 2 | A10 | d1, d2 |
| B1 | a1, b1, c1 |
| B2 | d1 |
| CHE423 | Quality Assurance and  Engineering Reliability | 2 | - | 1 | A4 | a1, a2, b1, c2, c4 |
| A6 | b1, c2 |
| CHE424 | Project 2\* | 2 | 4 | - | A7 | d1, d2, d3 |
| A8 | d1, d2 |
| A9 | d1, d2, d3 |
| B3 | d1 |
| B4 | d1 |
| CHE425 | Elective 5 | 2 | - | 2 | A3 | a2,c1 |
| A10 | d1,d2 |
|  | CHE426 | Elective 6 | 2 | - | 2 | A3 | a2, c1 |
| A10 | d1,d2 |
| B2 | d1 |
| B4 | d1 |
| **Total** | | **14** | **4** | **9** |  | |

|  |  |  |
| --- | --- | --- |
|  | **Code** | **Course name** |
|
| **Elective**  **1** | CHE316A | Liquefied Natural Gas |
| CHE316B | Gas Sweetening |
| CHE316C | Gas engineering |
| CHE316D | Introduction to combustion phenomena |
| CHE316E | Air Pollution |
| CHE316F | Engineering Materials Selection |
| **Elective**  **2** | CHE325A | Foams industry |
| CHE325B | Ceramics industry |
| CHE325C | Polymer engineering |
| CHE325D | Food processing technology |
| **Elective**  **3** | CHE415A | Electroplating |
| CHE415B | Synthetic fibers |
| CHE415C | Paints technology |
| CHE415D | Renewable Energy Sources |
| **Elective**  **4** | CHE416A | Water desalination |
| CHE416B | Wastewater Treatment |
| CHE416C | Rubber industry |
| **Elective**  **5** | CHE425A | Industrial safety |
| CHE425B | Special topics in chemical engineering |
| CHE425C | Plasticizers |
| CHE425D | Fertilizers technology |
| **Elective**  **6** | CHE426A | Pulp and Paper industry |
| CHE426B | Polymer processing |
| CHE426C | Refractories |
| CHE426D | Printing technology |

1. **Methods and rules for student evaluation**

The methods of assessments were set by the institute council and documented. The main assessment methods are:

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **LO's** | **Assessment length** | **schedule** |
| 1. Written exam | To assess knowledge and understanding intellectual skills: A,B | 3 hours examination | The 15th week |
| 1. Quizzes and reports | To assess knowledge and understanding & general and transferable skills: a, d | Continuous assessment | The 2nd -7th - 9th week |
| 1. Oral exams | To assess knowledge and understanding, intellectual, general and transferable skill: a, b, d | Assessment Session | The 14th week |
| 1. Practical | To assess knowledge and understanding, professional, general and transferable skill: a, c, d | 2 hours examination | The 14th week |
| 1. Project applied on a practical field problem | To assess knowledge and understanding skills, intellectual skills, professional skills, general and transferable skill: a, b, C, D | Continuous assessment | At the end of each semester |

1. **Program Evaluation**

|  |  |  |
| --- | --- | --- |
| **Evaluator** | **Tools** | **Sample evidence** |
| 1-Senior students | * Questionnaires | 15% of the students |
| 2- Alumni | * Questionnaires |  |
| 3- Stakeholders | * Questionnaires | Samples representative from all sectors |
| 4-External evaluator | * Review reports |  |

1. **Learning Resources**
2. No. and ratio of institute members and their assistants to students:
   * Staff members 7.5
   * Assistants 4
   * Students 56
   * "Staff members / Students" Ratio 1:7.5 = 13.33%
   * " Assistants / Student" Ratio 1:14 = 7.14%
3. Matching of institute members’ specialization to programme needs.

The institute members’ specialization is highly matches the courses offered in the program.

1. Suitability of the workload of the teaching staff

The workload of the teaching staff is Suitable.

1. Availability and adequacy of Programme Handbook

The program handbook is available, yearly, for the departmental heads and freely distributed to students of the preparatory level and staff members.

1. Availability and adequacy of library, laboratories, and computer systems

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Appropriate** | **To some extent** | **unsuitable** |
| **Library convenience** |  | √ |  |
| **Laboratories convenience** |  | √ |  |
| **Computer systems convenience** |  | √ |  |

1. Availability of field training opportunities for students

Communications are done with companies to provide training opportunities for students, and they are followed up by the teaching staff, the supporting staff, and the workers of the company itself.

1. Availability of any other programme requirements

* Regular maintenance of display devices
* Providing the Internet within classrooms and strengthening networks to facilitate the teaching staff

1. **Quality Management**
2. **Availability of regular evaluation and revision system for the programme**
   * Every 5 years the curriculum is revised and updated.
   * An internal evaluation system for the programme is going to be set.
   * An external evaluation system for the programme is going to be set
   * Commitment to internal and external reviewer amendments, such as updating references and modifying some course objectives
3. **Institute response to student and external evaluations**

The evaluation forms for all the courses are spread on samples of students by the end of each course. The evaluation forms are then analyzed and summarized. The students’ criticisms summary is sent to the department’s head that is in turn hand out the summaries to the department members to consider comments and deficits and take remedial actions.

1. **Administrative and organizational obstacles**

Not found

1. **Action Plan**

|  |  |  |  |
| --- | --- | --- | --- |
| **Aim** | **Action** | **Person Responsible** | **Completion Date** |
| Keeping up with developments in the field of chemical engineering | Upgrading, modifying curriculum plan and development the new program and courses specifications. | Head of the  Department & courses’ coordinators | Every 5 years |
| Increase some of scientific reference In the library of the institute | Add more scientific reference In the electronic library of the institute | Institute management | 2021-2022 |
| Increase self-study material | Include chapter one in the self-study material | Courses’ Coordinators | 2021-2022 |
| Using the internet in the research | self-study | Courses’ Coordinators | 2021-2022 |
| Relate the theoretical study by the practical field | Visits to petrochemical plants. | Institute management | 2021-2022 |
| Update references | Revising the courses of the new program | Courses’ Coordinators | 2021-2022 |
| To increase the online teaching | Preparing and adjusting the course material and activities to be more suitable for the online teaching. | Courses’ Coordinators | 2021-2022 |

Program coordinator: **Prof. Dr. Hend Elsayed Gadow**

Head of the Department**: Prof. Dr. Hend Elsayed Gadow**

**9/2021**