



Beni-Suef University
Faculty of Science



Special chemistry Program Report

A. Administrative Information

1- Program Title	Chemistry
2- Specialization	Special chemistry
3- Number of Academic years	Four years divided into eight semesters
4- No. of credit hours / No. of courses	Theoretical hrs. (94) + Practical hrs. (42)
5- Basis of evaluators committee choice	<p>There are committees of examiners in the program made up of professors working in the department, and examiners are not used from abroad.</p> <p>It was approved to activate the role of examination committees for the bachelor's degree in order to review the examination paper so that it conforms to the quality specifications and the unit of measurement and evaluation.</p> <p>The formation of the committees in the single chemistry program was as follows:</p> <p>1. Physical Chemistry Committee: Prof. Dr. Ahmed Ahmed Abdel Khaleq Prof. Dr. Hanafy Mahmoud Abdel Salam Prof. Dr. Muhammad Mostafa Al-Deeb</p> <p>2. Analytical and Inorganic Chemistry Committee: Prof. Dr. Muhammad Al-Qasim Hassouna Prof. Dr. Mohamed Magdy Khalil Prof. Dr. Sawsan Abdel Khaleq.</p> <p>3. Organic Chemistry Committee: Prof. Dr. Sayed Abdel Kader Ahmed Prof. Dr. Ali Al-Zanati Prof. Dr. Yasser Hassan Zaki</p>
6- External Evaluator	Available () <u>Not Available</u> ()
7- Academic Year	2022-2023
8- Approval date	9-2022

B. Basic information:**9- Statistical information:**

Number of students attending the program	<ul style="list-style-type: none"> • Number of students enrolled in the program: • At the first level in the academic year 2019/2020 = 49 • At the second level in the academic year 2020/2021 = 47 • The third level in the academic year 2021/2022 = 47 • Fourth level in the academic year 2022/2023 = 46
Rate of success in the program	<ul style="list-style-type: none"> • Percentage of students who passed the first level in the academic year 2019/2020 = 96% • Percentage of students who passed the second level in the academic year 2020-2021 = 100% • Percentage of students who passed the third level in the academic year 2021-2022 = 98% Percentage of students who passed the fourth level in the academic year 2022-2023 = 100%
Trending for joining program (Attributed to the number of students that joined to program through last three years)	<u>Increasing</u> (), Decreasing (), Fixed () It increases until 2022 and then decreases in 2023 because the program is selectively.
Results of the final exam	Pass (no.:46 100 %:), Fail (no.:0 0.0%:)
Grades	Excellent (no.:29 63 100 %) Very Good (no.:16 35%) Good (no.:1 2%), Pass (no.: 0 0.0%)
Number of students attending the program for 2022-2023	Males: 11 Females: 11 Total: 22 This is the first level for the academic year 2022-2023
Rate of success in the program	91 %
Final exam results:	Passed: (no.:20 91 %:), Failed: (no. 2 9.0%:)
Distribution of success ratings (%):	Excellent: (no: 9 43%), Very good: (no: 4 19%), Good: (no: 5 24%), pass: (no: 2 10%).

10-Academic standards.**-External references for standard:**

National Academic Reference Standards (NARS) for single programs of Basic Sciences that prepared by the National Authority for Quality Assurance and Accreditation of Education (NAQAAE) in January 2009 (1st edition):

This program aims to:

1. Recognize the role of basic science that meets community needs.
2. Provide graduate with a wide range of integrated knowledge, concepts and theories of basic science to interpret in the field of Chemistry.
3. Develop graduates with the skills of data collection, interpretation and presentation data in English and Arabic.

4. Demonstrate wide background knowledge related to the different branches of chemistry.
5. Collect, analyze, and present theoretical and practical data by using appropriate formats, scientific facts, theories and techniques.
6. Postulate concepts and choose appropriate solutions to solve problems on scientific basis.
7. Apply information technology relevant to the field of chemistry.
8. Participate in quality control processes, manage risks, work in a teamwork, decision making and organize time to finish jobs.
9. Conduct experimental work, evaluating the outcomes, and reporting data on practice.
10. Participate in research activities and representing working with relevant and advanced laboratory techniques.

-Knowledge and understanding:

By the end of this program the graduate should be able to:

- A.1. Mention the basic concepts of algebra, statistics, integration, differentiation, geometry, matter, light, waves, heat, crystal, radiation, animals' systems, plant taxonomy, crystals, minerals, soil.
- A.2 Sequence the terminology of computer science technology, principle of English languages and their help in science and environment.
- A.3. Outline the role of environment culture, management, human right and anti-corruption, and philosophy of science in life.
- A.4. Describe the basics concepts of physical chemistry, thermodynamics laws, the principals of phase diagrams for different systems, the electronic structures of atoms, different classes of organic compound and Mono and bi-function groups, and the classification of Micro- and macromolecules of carbohydrates, reactions and structure of saccharides, chemistry, classification of protein and synthesis of peptide, and lipids.
- A.5. Mention the chemical equilibrium, redox reactions, the different pH titration curves, hydrolysis of salts, Colloidal properties, buffer system, analytical tools and important terms in analytical chemistry.
- A.6. Describe chemical bonding, inductive effect, resonance effect, Acid-Base theories and chemical structure of polynuclear compounds.

A.7. Describe the information about, the difference between the classical and quantum mechanics, the black body radiation, the photoelectric effect and the dual nature of matter, physical and chemical properties of s and p block elements.

A.8. Define the electrolytic dissociation, the conductivity measurement, electrolyte, the transference of ions and the salvation of ions.

A.9. Mention the basic concepts of the field of X-ray diffraction and crystal structure, with focusing on state-of-the-art X-ray diffraction systems.

A.10. Describe stereochemical relationships (enantiomers, diastereomers, epimers, etc), physical and chemical properties of Mono, and bi- functional group compounds.

A.11. Describe the quantum numbers sources, the harmonic and anharmonic oscillator, the rigid rotor in quantum mechanics, the tunnelling in classical and quantum mechanics, precyclic photochemistry, the different electromagnetic regions, components of UV-Vis instrument, Beer's-Lambert law, different chromatographic and instrumental techniques for analysis.

A.12. Define electrode, electrolyte, overpotential, escaping tendency, colligative properties, factor affecting reversible and irreversible cells, types of thermodynamics parameters of solution and battery (reversible and irreversible), the rate of reaction, different chemical rate of reaction and the factor affecting on the reaction rate.

A.13. Describe the basic concept of transition elements, different important complexes of the transition metals and coordination chemistry, heterocyclic compounds, synthesis and reactivity, physical organic chemistry including types of reactions and reaction mechanism, polymer molecules, different types of polymer structures, polymerization process, copolymerization process and different methods for the determination of polymer molecular weight.

A.14. Recognize the IR, laser, microwave, NMR and Raman spectroscopy.

A.15. Define the lanthanides, actinides, characteristic properties of f-block elements, crystal field, molecular orbital theories and their application to problems, the principles of a systems approach to electro-analytical concepts, and the principal of orbital symmetry and pericyclic reactions.

A.16. Describe the sources, methods of extraction and techniques that used for identification of natural products, organic compounds by using spectroscopic tools.

A.17. Mention the importance of automated analysis compared to manual instrumental methods of analysis, the information about the thermal gravimetric analysis, its types, instrumentations, kinetic methods of analysis for catalytic and non-catalytic reactions, the corrosion process, different types of corrosion, factors affecting the corrosion process and methods of the corrosion control, and the kinetics of chemical reactions.

A.18. Describe organometallic compounds and their classification, biochemical processes, dissociation of bio ligands and complex formation, the different types of petrochemicals such as crude oil and natural gas, the different types of colloidal systems, the phase rule, different types of phase diagrams, factor affecting the properties metal alloys and composites, the energy sources, different types of energy sources and cells used in energy conversion.

A.19. Mention the various application technique commonly used in the physical laboratory for calculating the numerical value for K_{eq} starting from partition coefficient K_c , the polymerization equation rate, different types of polymerization techniques, factor affecting the molecular weight of polymers and the industrial applications of organic polymers.

A.20. Describe the most common steps used in preparation of nanomaterial, the sources of every type of pollutions and the means of removing or treating the polluted media, and the preparation techniques of samples for real chemical analysis and theories dealing with the methodology to prevent the interference.

A.21. Describe the difference between the homogenous and heterogenous catalysis, the substitution reactions of square platinum complexes and charge transfer concept, chemical structure of various dyes, and different types of buffer solution.

-Intellectual skills

By the end of this program the graduate should be able to:

B.1. demonstrate the different theory and postulate in geometry, integration, algebra, statistics and differentiation.

B.2. Classified the different animals systems, plant taxonomy, crystals, minerals, soil and the different of properties between matter, light, waves, heat, crystal and radiation related basic science.

B.3. Mention on the role of computer, English languages, environment culture, management, human right, and philosophy terminology in science and environment.

B.4. differentiate between the different properties of matter types, phase systems, the mathematics equations of zero, 1st, 2nd and 3rd laws of thermodynamics, the types of reactions as being oxidation or reduction, common and IUPAC names of different classes of organic compound, different pH titration curves, and different types of polynuclear compounds, and different types of nucleophilic substitution reactions.

B.5. Illustrate black body radiation, the photoelectric effect and the postulates of quantum chemistry, the characteristic X-ray, type of unit cells, mechanisms used in preparation of organic compound.

B.6. Discuss how to differentiate between different types of s and p block elements, the electrolytic data, chiral compounds containing one or more chiral carbon atoms, essential and nonessential fatty acids, and the importance of sex hormones.

B.7. Deduce the mechanism and order of organic and inorganic reaction.

B.8. Compare between reversible and irreversible cell, the different electromagnetic regions IR, UV, H-NMR and the effect of every region on the atoms and molecules and also between the different chromatographic techniques and instruments used for analysis.

B.9. Demonstrate the rules for electronic distribution of transition metals, physical and chemical properties of transition metals, coordination number of transition elements and name and formula of ligands, the mechanism of substitution reactions, addition, nucleophilic and elimination reactions, the different types of molecular spectroscopy.

B.10. Distinguish between the different types of polymers initiators, and different types of buffer solution.

B.11. Suggest methods for pericyclic reactions, electrocyclic reactions, the general methods of structure elucidation of natural compounds.

B.12. Calculate the ν in IR using Hooke's law and λ_{\max} using Fieser-Woodward method in the UV spectra of organic molecules.

B.13. Differentiate between types and forms of corrosion, different types of energy, cells used as a source of energy, different types of adsorptions and factors affecting adsorption by kinetics of adsorption, the different types of manual and automated instrumental methods of analysis, chain and stepwise mechanism of polymerization, crude oil and

natural gas.

B.14. Illustrate analytical application of TGA, DSC, DTA, differential Logarithmic extrapolation and proportional- equation the methods of analysis for the determination of mixture species, the different mechanisms of organic and inorganic reactions.

B.15. Discuss the application of organometallic compounds in organic chemistry, the applications of colloidal systems in industry.

B.16. Discuss the structure and morphology of nanomaterials, and the method of preparation of bioplastic.

B.17. Classify the molecules according the point groups and use their character tables to know the symmetry operations, and the ways to increase the rate of reactions occurring in surface of metals, solid state materials.

B.18. Illustrate the global economic losses resulting from pollution problems, and the adverse effects of interferences from which each instrument suffers for chemical analysis.

B.19. Differentiate between quadrilateral symmetric and hexagonal symmetric complexes, different methods for synthesis of dyes.

-Professional and practical skills

By the end of this program the graduate should be able to:

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C.1. Use the basic information of calculus, algebra, statistics, geometry, physical laws, different types of motions in other disciplines.

C.2. categorize the principle of computer program, software, management, human right and anti-corruption, English language, and philosophy of science, in solving environmental problems.

C.3. Illustrate the complexity of tissues, morphology of plants, animal and insects organs, crystal systems, crystal classes and the different crystal forms using light microscope.

C.4. Examine Schrödinger equation for different systems and get the spectra (Eigen values), the electronic structures of some compounds and their oxidation state for every atom, the conductivity for different electrolyte, factors affecting on different types of nucleophilic substitution reactions.

C.5. Evaluate the Grin size, lattice parameters and other structural properties,

chemical and physical properties, atomic numbers, electronic configuration into metals, nonmetals, semimetals, Nobel elements, and new methods for separation of an optically active compounds.

C.6. Conduct of standard laboratory procedures for practice skills of accuracy to investigate the chemical structure of unknown organic compounds, protein and amino acids in prepare lab report.

C.7. Solve the problems using particle in a ring as a model for cyclization of compounds, the electrode potential and EMF of electrochemical cell, and the reaction ordered.

C.8. Apply the rules, naming coordinated compounds for naming different ligands and complexes, model the mechanism of some chemical reactions, obtained spectra together to identify the structure of compounds.

C.9. Compute the different scheme for synthesis and reactions of hetero cyclic compounds, different types of buffer, and Interpret the affecting of polymerization conditions on polymers structures and properties.

C.10. Apply different methods for molecular weight determination of polymer, suitable method and tools to prepare and analyze complexes, the extraction techniques in isolation of natural products, and investigate the diagrams of an electrocyclic reaction and pericyclic reactions.

C.11. Use spectroscopic techniques to know the structure of un known chemical compounds from chemical analysis charts e.g: UV- IR, H-NMR and Mass.

C.12. Use chemical tools to measure both partition coefficient K_c and equilibrium constant K_{eq} .

C.13. Use Gaussian program for calculating thermodynamics parameters using ab initio and DFT methods).

C.14. Apply new research idea in various research topics such as natural products, polymer chemistry and water treatment.

C.15. Apply the schemes for applications of materials, the phase rule for two and three components system practically.

C.16. Report the environmental problems in Egypt and the Globe.

C.17. Implement chemical investigation to know the structure of dyes as common industrial effective compounds, and the application of organometallic to catalyst, different energy transformation.

-General and transferable skills

By the end of studying the program, the graduate should be able to:

D.1. Accepts supervision and direction learn with others to simple verbal or written communication.

D.2. Learn how to search for information using the library or internet resources, working in a group, and make a short report in a written form and orally using appropriate scientific language.

D.3. Think independently, set tasks and solve problems on scientific basis.

D.4. Provide the students with the skills of self-learning through communicate with students via e-mails or websites to save time.

D.5. manage time, collaborate and communicate with others positively.

D.6. Encourage students to think critically and involve in discussions with the instructor in class room.

D.7. Apply scientific models, systems and tools effectively.

D.8. Learn how to search for information using the library or Use of technological tools.

D.9. Acquire self- and long life-learning.

- Ways of supporting students (those with disabilities and outstanding)

Care programs for students with limited abilities: - Academic support through:

1. New students who are struggling academically are detected by conducting periodic evaluation examinations throughout the semester and by grading the year's work in scientific subjects.

2. Follow-up forms are made for old and new faltering students to monitor performance and timely intervention from academic advisors or the faltering students follow-up committee.

3. The reasons for stumbling are searched through discussion sessions with each student and the follow-up committee, then between the follow-up committee and the professors of the courses in which the student stumbled and the guardian, if necessary.

4. A mechanism will be developed that the student agrees on with the committee and the course instructor to overcome the reasons for failure, according to what each case requires.

5. Strengthening groups are made from outstanding students to struggling students (student teachers).

6. Periodic meetings are held with the struggling student and the committee until the stumbling blocks is overcome.

7. The results are presented semi-monthly to the department heads, then the college dean for education and student affairs, and the guardian is notified.

Sponsorship programs for outstanding students:

2. Moral support by announcing the names of the top ten on bulletin boards and on the website.

3. Professional support by including distinguished students in scientific competitions and training courses.

4. Social support: by participating in trips for free, and obtaining a free textbook.

- Program Guide:

Available (), Not available ()

- System of periodic review of the program:

Available (), Not available (), Annual (), More than a year ()

- Measurement reference standards of the program

The graduate specifications are reviewed according to societal changes and in light of the program's adoption of national academic standards, as the first approval of the chemistry program graduate specifications was on November 16, 2015 (attached 7/1/2 Approval of the program graduate specifications in 2015). There is a system for periodic review of the program graduate specifications that was approved on October 19, 2015 (attachment 8/1/2 Approval of the system for periodic review of graduate specifications). The latest update to the graduate specifications after review was approved on December 11, 2019 (attached 8/1/2). The program periodically spreads awareness regarding the renewal of the definition of graduates' specifications for students and the labor market.

- Regulatory and administrative obstacles

- There are no administrative obstacles to achieving the knowledge and skills targeted by the scientific program, which graduates must acquire in accordance with the strategic objectives of the college.

- The College's Quality Assurance Center adopts support for the efforts of the Department's Quality Assurance Unit to achieve the targeted learning outcomes through the Education Development Center's courses and external review committees for the college's course files.

Programs and curricula are periodically reviewed to achieve the targeted learning outcomes of the program at several levels, including academic departments, the Educational Affairs and Educational Development Committee, the college's Quality Assurance Unit, and the College Council.

- Lack of financial resources to finance various activities.

- Weak labor market participation in updating graduate qualifications.

-Comments of External evaluator (if available):

- The external evaluator of the program descriptions, syllabuses and reports of the program syllabuses was carried out by Prof. Dr. Alaa El-Din Abdel Aziz Al-Nanaa'i, Emeritus Professor in the Department of Zoology, Faculty of Science, Menoufia University.

The examination and review revealed that the following items need review and scrutiny in course reports:

1. Compatibility between the teaching and learning methods used in the course description and the course report.
2. Compatibility between evaluation methods and teaching methods mentioned in the course report.
3. Administrative obstacles.
4. The improvement plan is almost uniform for most reports. Here, it is requested that the improvement points be consistent with the course requirements.
5. Internal and external review of the program and courses.
6. Signature of the instructor or course coordinator.

Please also review the following course reports and correct the errors contained therein in light of the aforementioned points:

- Inorganic 1 & Physical chemistry 1
- Principles of systematic and microbiology
- Fundamentals of Zoology 2 (Invertebrate & Vertebrate)
- Ordinary differential equations
- Chemistry of Transition Metals 1 and coordination chemistry
- Chemistry of Transition Metals (2)

7. Please unify the method of describing courses according to the model of the National Authority for Educational Quality Assurance.

8. There must be dedicated teaching methods for students with limited abilities (struggling).

9. The following course descriptions need careful review:

- General physics 3
- Chemistry of main group elements
- Kinetics of chemical reactions
- Applied chemistry
- Organometallic Chemistry
- Solid state chemistry
- Chemistry of Transition Metals (2)
- Chemistry of colloidal solutions
- Bioinorganic Chemistry Natural products chemistry

11. Learning Resources

1. - Analyzing the results of the examinations and inquiring with the course coordinators after informing them in the department councils of the results of their examinations about any unusual results, such as an increase in the percentage of failures or an unreasonable increase in the percentage of those receiving an excellent or acceptable grade.

2. - Examination of the examination paper through a committee formed by the program from the department's faculty members in the Scientific Department Council on June 2017. Its mission is to examine the examination paper in terms of form, ensure the extent and scope of its measurement of the targeted educational outcomes, and submit a report

of the examination result to the Department Council. Scientific, which in turn notifies the examiners of the results of the examination and the completion of the proposed observations.

3. - Internal and external evaluator report of the program.
4. - Survey of the opinions of beneficiaries in the labor market.
5. Online learning.

1. Weight of assessments:

Assessment	% practical and theoretical courses	% theoretical courses
Mid-term exam	5	1
Practical exercises	5	15
Oral exam	10	10
Practical exams	20	--
Final exams	60	60
Total	100%	100%

Schedules:

The adopted system relies on direct and indirect methods to evaluate student learning outcomes:

- Direct methods: include a written test with various types of questions that measure different skills, in addition to a practical test, direct observation, field training, presentations, research, and mid-semester evaluation for students.
- Indirect methods: include semi-semester course evaluation by students, course reports, student participation rate in active learning, external review reports, questionnaires, and interviews regarding the opinions of final team students, graduates, beneficiaries and faculty members on the extent to which learning outcomes have been achieved. Targeted. Finally, students' assessments and results upon graduation are in addition to the system stipulated in the college's academic regulations, as the college's academic regulations stipulate a system of evaluation and examinations for students.
- All evaluation systems are announced in the student handbook, as well as through awareness-raising on the part of faculty members within the framework of lectures, communication during office hours, or academic advising groups.

The system is announced on the college's website and in the student handbook. The practice of the system is also considered an announcement of it, and students are notified

of the controls for setting evaluation grades, whether on tests, discussion, assignments, etc., through the faculty member and through course descriptions in which the evaluation methods, timings, and grades are clear.

Assessment schedules/semester:

Method	Week(s)
Mid-term exam	6 th
Oral exam	13 th
Practical exams	15 th
Final exams	managed by administrations (in the last two weeks of semester)

Methods of program evaluation:

Evaluator	Tool	Samples
1- Senior Students	Questionnaires and open discussion	50%
2- Alumni	Meeting and Questionnaires	50%
3- Stakeholders (Employers)	Meeting and Questionnaires	Approximate sample
4- External Evaluators	Test reviews	All participants in the programmer
Other (External examiners)	Personal interview	All participants in the programmer

a. Ratio of faculty members to students

- The ratio of faculty members to the total number of students enrolled in the program for the academic year 2022/2023 is sufficient according to the National Academic Reference Standards (NORMS) for human potential, and is as follows: Number of students: Number of faculty members = 124/69

First term: 1: 2

Second term: 1: 2

b. Matching of faculty members' specialization their load to program needs.

Available (), to some extent (), not available (), (why)

Number of theoretical hours in the program / Number of faculty members in the program = 94/52 (2:1) each member teaching 2 hours in chemistry program

c. Library:

Available (), to some extent (), not available (), (why)

- The area of the college library is about 210 square meters, and it is proportional to the number of students, as the space allocated to each student is 2 square meters, and it has a number of workers and technicians that conform to the specifications. All of them are graduates of the Department of Documents and Libraries at the College of Arts and have taken qualification and training courses on electronic classification and indexing.
- There are approximately 4,300 foreign books in the library, 500 Arabic books, and more than 1,000 master's and doctoral theses. Most of the books have at least two copies available and are updated periodically. The library has also been provided with some scientific periodicals.
- Security and safety procedures are available in the library in accordance with the national academic reference standards and the conditions of the Civil Defense and Fire Authority.
- The library has 15 computers equipped with the Internet to access databases for students and faculty members. A university email has also been created for both the student and the faculty member, through which they can contact the knowledge bank, the digital library, and the educational platform.
- Borrowing methods and facilities provided to students and faculty members in the library, which are as follows:

Borrowing is personal, and the book is not permitted to be delivered to anyone other than the borrower, with the approval of the book's owner, if any.

The borrower is obligated to compensate for every book he destroys or loses by paying three times its price, and for a lost book from a collection, the borrower is obligated to pay the price of the collection.

- It is not permitted to lend general references, magazines, old and rare books, manuscripts, single copies, or first copies in the library.

Photocopying of master's and doctoral copies is not permitted until three years have passed, and only the introduction and references are photocopied.

- Viewing messages takes place inside the library.

- Do not allow copying of works in a way that constitutes an infringement on copyright to protect scientific works.

The loan period is as follows:

- | | |
|----------------------------------|------------------------------|
| - Professor Doctor 15 days | Assistant Professor 15 days |
| - Teacher for 7 days. | Assistant teacher for 7 days |
| - Teaching assistant for 3 days, | student for 3 days |

d. Laboratories:

Available (), to some extent (), not available (), (why)

- The college has nine laboratories necessary to achieve the knowledge and skills targeted by the scientific program, which graduates must acquire in accordance with the strategic goals of the college.
- Security and safety procedures are available in the laboratories in accordance with the national academic reference standards and the conditions of the Civil Defense and Fire Authority.
- The laboratories are compatible with the number of students allowed in accordance with the educational quality standards issued by the National Authority for Accreditation and Quality: The number of students in the laboratories is 25 students (with an increase in numbers allowed within a maximum of 10%).

The capacity and space allocated to each student in the laboratories are consistent with the National Academic Reference Standards (NORMS) for laboratories.

- The college has a committee responsible for managing all the college's laboratories, including the program, which works on periodic maintenance of the laboratories and follows up on security and safety procedures within the laboratories, and this follow-up takes place on a periodic basis.

e. Computer:

Available (), to some extent (), not available (), (why)

The use of 15 computers in the library equipped with the Internet was made available to access databases for students and faculty members. A university email was also created for both the student and the faculty member, through which they can contact the knowledge bank, the digital library, and the educational platform.

f. Field/practical training resources.

Available (), to some extent (), not available (), (why)

There is fruitful and mutual cooperation with a diverse number of business entities, for example:

1. Cooperation agreement with Beni-Suef Cement Company (Titan Egypt)
2. Holding the college's employment forum, through which many companies are invited and thus provide opportunities for graduates of the program to work in those companies.
3. In cooperation with the college's dean for community service and environmental development, a number of third-level students in the program are nominated for training in some entities such as (the Health Directorate - the Water and Sanitation Company - some medical laboratories - the yeast factory in Beni-Suef).

g. Any other program needs.

Available (), to some extent (), not available (), (why)

- Learn and apply the English language.
- The subject of research and essay is more than one year, meaning that the graduation project is not enough and we must provide the student with more methods.

13. Quality Management and Enhancement

Formation of the organizational structure of special chemistry program:

Name	Job
Prof. Dr. Hanafy Mahmoud Abdel Salam,	Program director
Dr. Ali Hassan Mohammad,	Program Coordinator (Executive Director of the Program)
Prof. Dr. Yasser Hassan Zaki,	member of the Examinations, Evaluation and Learning Outcomes Committee
Ass.Prof. Ashraf Al-Basiouni,	member of the program's academic advising committee
Ass.Prof. Omaima Fawzi Abdel Gawad,	member of the program's review and development committee
Dr. Shaima Abdel Latif	member of the student committee and faculty members of the program
Dr. Sahar Mahmoud,	member of the program's Academic Standards and Courses Committee
Dr. Israa Jaber Arafa,	media coordinator of the program
Eng. Abdul Rahman Jamal,	Secretary of the Program
Mr. Gamal Eid,	member of the program's administrative systems committee

a. Effectiveness of the Follow-up system for deficiencies

Effective (), to some extent (), Not effective (), (why)

The program seeks to achieve standards of quality performance, and accountability and accountability are one of the effective methods by which the extent of achieving comprehensive performance quality standards is recognized and approved by activating the regulations for accountability and accounting in the field of educational effectiveness, and given that the university law in its current state does not allow for much accountability. As for accountability, with regard to educational effectiveness, the college must be careful to establish an internal system to ensure quality, evaluate its performance periodically, and develop new mechanisms for accountability and accounting. Applied practices in this field include the following:

1. The program is keen to review and activate current regulations and laws related to accountability in the areas of educational effectiveness.
2. Developing new mechanisms for accountability and accountability, which were approved by the Department and College Council (6/2017).

b. Effectiveness of Faculty and University laws and regulations for progression and completion.

Suitable (), to some extent (), not suitable (), (why)

Within the framework of its authority, the program and the institution rely on the Universities Organization Law, the Faculty Member Duties Clause, Articles 11-11, the duties of the supporting staff in accordance with Articles 411-411, and the Disciplinary Clause, Articles 421-442, in which the penalties include drawing attention, censure, and removal from the job.

However, due to development needs, the following mechanism is relied upon without violating the law:

1. In the event of poor performance of a faculty member through the report received for the first time about the evaluation of the course assigned to him, a friendly meeting is held with the head of the department or the dean of the college, followed by an official letter addressed to him, after which the faculty member is deprived of teaching that course if the poor performance continues without improvement. In the following evaluation report, this also applies to assistant faculty members from the results of the

opinion poll to measure their competence by the laboratory supervisor, students, or department head.

2. In the event of a complaint filed against any faculty member or supporting staff, the validity and seriousness of the complaint is verified by the department head and the necessary action is taken to return the rights to their owners through amicable and then legal means if necessary.

c. Effectiveness of program internal evaluation system:

- Internal evaluation system develops the program through the following points:

1. Submit a detailed report to the Program Quality Management Board on the status of the program, explaining the strengths, weaknesses, and priorities for improvement for each of the standards of the National Authority for Academic Accreditation and Evaluation, and the level of the program among other programs.

2. The program became aware of their level of quality assurance, and documented the program's quality work within permanent locations in the college, which helped the program meet the requirements for program accreditation.

3. Determine the training needs and areas of technical support for program faculty members.

4. The presence of tools and models for internal audit.

5. Activating the spirit of competition among the university's academic programs.

6. Internal audit helped form an accreditation team at the college.

7. It helped the program to continuously improve its performance through the recommendations it provided.

8. Transferring distinguished experiences between academic programs.

d. Effectiveness of program external evaluation system:

i- External evaluators

The program description is good. Please review the program structure and review the evaluation methods mentioned in the course descriptions in accordance with the program regulations. Please also review the compatibility matrix of the program's targeted learning outcomes with the adopted academic standards. The compatibility matrix of learning outcomes for the program and courses and carefully review the course descriptions and complete the teaching and learning methods for students with

limited abilities. The program and courses, unifying the description methods to include a matrix of compatibility of the course content with the learning outcomes, and making observations included in the body of the report.

ii- Students

Strength points: -

- The program's mission and objectives are specific and clear
- It is easy to find information about the program before registering for it
- A student guide is available that includes information about the program and its student support services
- The student guide explains the program's objectives in a way that allows one to learn what needs to be learned during the study period
- Faculty members adhere to the dates and number of lectures and the specified curriculum
- Students are notified of the outcome of their complaint
- The program contains various courses that are characterized by integration and diversity
- The courses are characterized by good and useful scientific content
- Faculty members and supporting staff are well acquainted with the courses and their objectives
- Faculty members adhere to the dates and number of lectures and the specified curriculum
- The program has training programs with external entities for post-graduation qualification
- Students participate in preparing the examination schedule
- The halls are characterized by good ventilation, lighting and cleanliness
- The graduation project gives the student new skills and helps him qualify for the labor market
- I used the Internet to search for information/study topic
- I do scientific activities with the participation of my classmates
- I carry out scientific activities with the participation of my colleagues under the guidance of faculty members at the college

Points to be improved: -

- Laboratory equipment, including devices, chemicals, etc., is compatible with the program requirements.

iii- Other Stakeholders

Strength points: -

- Scientific material and the ability to keep up with updates.
- Adapting to the work environment (different specializations) and quickly absorbing work techniques.
- Diversity of skills (working well under pressure - self-learning - quick understanding - taking responsibility - accuracy)
- Commitment to professional ethics.
- The ability to think, constantly develops, and plans to reach goals.
- The ability and knowledge to deal well and appropriately with chemicals.

Points to be improved: -

- Lack of sufficient training in aspects of industrial security and the environmental aspect.
- The strong link between the scientific subject during study and the labor market requires more different education methods that benefit the labor market.
- Weak capabilities in laboratories due to lack of financial resources.

14. Proposals for program development

a. Program structure (units/credit-hours).

Program duration: four years

94 theoretical hours + 42 practical hours, for a total of 136 hours.

- Basic science courses: 36, with a percentage of 26.47%
- Humanities and Social Sciences Courses: Number 8, with a percentage of 5.88%
- Specialized science courses: 84, with a percentage of 61.76%
- Computer Science Courses: Number 8, with a percentage of 5.88%.

courses	The latest list since the academic year 2019/2020 (94 theoretical hours + 42 practical hours, for a total of 136 credit hours)		The old list from the academic year 2011/2012 (112 theoretical hours + 34 practical hours, for a total of 146 credit hours)		Reference ratio
	ratio	credit hours	ratio	credit hours	
Basic science courses	26.47	36	20.55	30	29-27
Humanities courses	5.88	8	4.11	6	7-5
Specialized science courses	66.29	82	72.6	106	52-48
Computer science courses	5.88	8	1.37	2	7-5
graduation project	1.47	2	1.37	2	3-1

b- Courses, deletions and additions and modifications.

Based on a survey of student opinions and the labor market, some new courses have been added that serve the industry, and the surrounding environment:

1. Electrical cells (4235-019).
2. Principle of nanotechnology (4217-03).
3. Chemical pollution (4237-039).
4. Catalysis and Surface Chemistry (4218-041).
5. Chemistry of colloidal solutions (4218-042).
6. Pesticide Chemistry (4248-066).
7. Advanced Electro-analytical Chemistry (4237-036).
8. Corrosion chemistry and double layer (4218-043).
9. Corrosion chemistry and double layer (4218-043).

Courses deletions:

1. Principle of biochemistry (2) (Ch. 251)
2. Principle of biochemistry (2) (Ch. 252).
3. Environmental organic chemistry (Ch. 442).
4. Environmental and Electro-organic chemistry (Ch. 415).

Analysis of examination results for the academic year 2022-2023 showed the following:

- There is a relative conformity with the normal distribution curve in 84 courses out of a total of 93 courses, i.e. 90.3%.

- The curve tends towards higher grades in 9 courses out of a total of 93 courses, i.e. 9.67%.
- The curve tends towards lower estimates in 1 course out of a total of 93 courses, i.e. 1.07%.

After discussing the results in the Scientific Department Council, the Council recommended taking the following corrective actions:

- 1- Holding a training course entitled “Testing Vocabulary to Measure Targeted Learning Outcomes” for faculty members, especially those who found a defect in their exam results.
- 2- Updating the reference and change teaching method of courses whose results tend toward higher grades.
- 3- Activating the role of the college’s measurement and evaluation unit. To follow up on the work of evaluation, analysis, electronic correction, and review of the examination paper.
- 4- The faculty member teaching some courses changed due to stable success ratings in his courses and a defect in his exam results.

c- Training and skills.

In addition to training inside and outside the college at the level of some neighboring industrial bodies, other bodies have been added to allow students to be trained, through joint cooperation agreements with them, such as the Titan Cement Industry Company, or in a community manner, such as the North Upper Egypt Food Industries Company. The college also holds an employment forum every year, where In which students interact with the labor market and its people to gain their own expertise and experiences.

- Increasing the hours allocated for field training.

d-- Action Plan (referring to Business sector proposals and annual course reports).

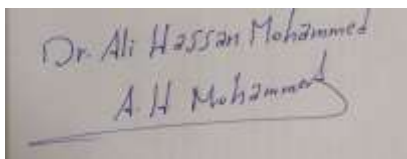
Based on a report on the analysis of the student opinion survey questionnaire and the labor market for graduates of special Chemistry Program, it was proposed to add a group of new courses that serve the field of industry:

1. A study material on quality control because it is the basis in most fields.
2. Industrial materials related to the labor market, such as:

- Proposing a study material on the cement industry and its components.
- Suggesting a study material on the ceramic and porcelain industry and its components.
- Proposing a study material related to the purification and treatment of wastewater, industry and agriculture.
- It is preferable to work in the Department of Applied Chemistry and work on teaching and teaching students in the field of occupational safety and health.
- Increasing the number of workshops, seminars and conferences to raise students' efficiency.
- There should be additional hours in the summer, which are optional but prepare the student professionally for the labor market.
- The existence of mechanisms and methods for communicating with labor market authorities and graduates, such as:
 1. Having pages on social media sites to facilitate communication with labor market authorities.
 2. Create a special group for graduates of the program to communicate.
 3. Announcing jobs on the program and college groups so that we can maintain continuous contact with the graduate.

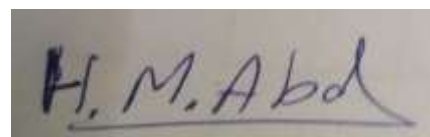
Program Coordinator

Dr. Ali Hassan Mohammed

A rectangular box containing a handwritten signature in black ink. The signature reads "Dr. Ali Hassan Mohammed" on the top line and "A. H. Mohammed" on the bottom line, with a horizontal line underneath the second line.

Program Director

Prof. Dr. Hanafy M. Abdel Salam

A rectangular box containing a handwritten signature in black ink. The signature reads "H. M. Abd" in a stylized, cursive font.