



## Study Plan Bachelor Degree in Biological Sciences

Department of Biological Sciences/ Faculty of Science  
Yarmouk University  
(Irbid - Jordan)  
2021- 2022

### Contact Information:

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### معلومات الاتصال:

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البريد الالكتروني

|  |  |                           |
|--|--|---------------------------|
| <b>Department: Biological Sciences</b>   | <b>Program: Bachelor Degree in Biological Sciences</b> | <b>official<br/>Stamp</b> |
| <b>The study plan was approved by the decision of the Deans' Council no. .... on .....</b> |  |                           |

| Overview   |
|--|
| <p>The Department of Biological Sciences was founded in 1976, concurrently with the establishment of Yarmouk University. Initially, the department offered a Bachelor of Science degree as part of its Biology major program. Subsequently, in 1982, the department introduced a Master of Science degree program in various fields, including biochemistry, genetics, microbiology, parasitology, botany, taxonomy, and molecular biology.</p> <p>The first group of students graduated with B.Sc. and M.Sc. degrees in 1980 and 1982, respectively.</p> <p>Presently, approximately 100 to 120 students annually graduate with a B.Sc. degree, while the number of students graduating with an M.Sc. degree is between 10 to 15. The department currently has 500 undergraduate students and 100 graduate students enrolled.</p> <p>To date, more than 3000 students have graduated with a degree from the department, with over 1000 receiving a Master's degree. The department has a total of 39 staff members, including 20 faculty members, 7 teaching assistants, and 12 laboratory technicians. There are 7 laboratories for teaching and 11 for research purposes, which are equipped with state-of-the-art research equipment in various fields of Biological Sciences, including an electron microscope unit. Additionally, the department maintains a greenhouse and an animal house for teaching and research purposes.</p> <p>To keep up with the advancements in the field of Biological Sciences, the department has recently established a new program in Biotechnology at the M.Sc. level. The Department's objective is to provide a contemporary and comprehensive biology program that prepares students to work in different fields of science and education in their country or abroad, or to continue their higher studies.</p> |

| Vision and Mission |   |
|--------------------|---|
| <b>Vision</b>      | <p>The Department of Biological Sciences is looking to advance the biology specialty by introducing up to date knowledge and practice in nanotechnology, biochemistry, molecular biology and cell biology techniques and approaches. The department makes every effort for excellence in teaching, research, and service. We are aware to emphasize the importance of biology in the advancement of research in our university as well as in the country. Therefore, recognition of the essential of modern biology is the utmost priority in the next ten years.</p> <p>Including new tracks in the master degree program is a plan to be applied, which requires full equipped facilities in the teaching and research labs. Introducing new programs in the postgraduate studies is mandatory to establish Ph.D. program in the near future.</p> |
| <b>Mission</b>     | <p>The primary goal of the Department of biological Sciences is to provide and convey enough knowledge and practical approach about different living organisms such as animals, plants, bacteria, viruses, fungi and algae. Moreover, molecular biology, biochemistry, genetics, and cell biology are the major topics in understanding and coping with contemporary biology. In the postgraduate level, there are two major tracks of biological fields, biological sciences and biotechnology streams.</p>  |

| <b>Program Objective</b> |  |
|--------------------------|--|
| <b>1</b>                 | <b>Getting the program of biological sciences into excellence locally and regionally.</b>  |
| <b>2</b>                 | <b>The creation of scientific and research environment that enable students and faculty members to cope with the scientific progress in the world and the opening of scientific and research channels with universities of the advanced world.</b> |
| <b>3</b>                 | <b>Cooperation with other academic programs at the university to provide interdisciplinary service courses.</b>  |
| <b>4</b>                 | <b>Rehabilitation of the students and prepare them strongly to meet the needs of the Jordanian and regional markets at the academic and applied levels in the areas of education, health, environment, agriculture and energy.</b>                 |

| <b>Program Learning Outcomes PLOs</b> |  |
|---------------------------------------|--|
| <b>PLO1</b>                           | <b>Apply information from core subjects in the biological sciences, including cell biology, genetics and evolution.</b>  |
| <b>PLO2</b>                           | <b>Effectively communicate scientific ideas in both written and oral formats, data analysis, thinking, planning and decision making skills.</b>  |
| <b>PLO3</b>                           | <b>Demonstrate the scientific methods through the use of hypothesis testing in the design and implementation of an experiment.</b>   |
| <b>PLO4</b>                           | <b>Demonstrate informational literacy by having the ability and skills to effectively and legitimately use various sources of information requires for functioning in a global, information society.</b> |
| <b>PLO5</b>                           | <b>Critically analyze primary scientific literature.</b>   |
| <b>PLO6</b>                           | <b>Demonstrate that they can perform a set of basic laboratory skills.</b>   |
| <b>PLO7</b>                           | <b>Appreciate impact of living organisms' on their lives.</b>  |

## Study Plan for the Bachelor's Degree in Biological Sciences

The Department of Biological Sciences at Yarmouk University offers a Bachelor's Degree on the completion of the following requirements:

1. The fulfillment of the conditions Stated in the regulations of awarding the Bachelor's Degree at Yarmouk University No. (2) for the year 1991 and its amendments issued in accordance with the bylaws of awarding academic degrees and diplomas at Yarmouk University No. 76 for the year 1976.

| Credit hours to obtain a degree in Biological Sciences |              |           |            |
|--|--------------|-----------|------------|
|  | Credit Hours |           |            |
|  | Compulsory   | Elective  | Total      |
| University Requirements                                | 15           | 12        | 27         |
| Faculty Requirements                                   | 21           | -         | 21         |
| Department Requirements                                | 65           | 21        | 86         |
| <b>Total</b>   | <b>101</b>   | <b>33</b> | <b>134</b> |

| First: University Compulsory Courses (15) Credit Hours |            |   |                        |           |          |               |
|--|------------|---|------------------------|-----------|----------|---------------|
| Course Code  | Course No. | Course Name                             | Number of Credit Hours |           |          | Pre-requisite |
|  |            |   | Theoretical            | Practical | Total    |               |
| HUM  | 117        | Pioneering and Creativity               | 1                      | -         | 1        | -             |
| HUM  | 118        | Leadership and Society                  | 1                      | -         | 1        | -             |
| HUM  | 119        | Life Skills                             | 1                      | -         | 1        | -             |
| HUM  | 120        | Communication Skills (English Language) | 3                      | -         | 3        | -             |
| HUM  | 121        | Communication Skills (Arabic Language)  | 3                      | -         | 3        | -             |
| HUM  | 124        | National Education                      | 3                      | -         | 3        | -             |
| MILT   | 100A       | Military science                        | 3                      | -         | 3        | -             |
| EL   | 099        | English language skills –<br>إستدراكي   | إستدراكي               | -         | إستدراكي | -             |
| AL   | 099        | Arabic language –<br>إستدراكي           | إستدراكي               | -         | إستدراكي | -             |
| COMP   | 099        | Computer Skills –<br>إستدراكي           | إستدراكي               | -         | إستدراكي | -             |
| SA   | 100        | Volunteer works and ethics              | 0                      | -         | 0        | PASS/FAIL     |

| <b>Second: University Elective Courses (12) Credit Hours: Student should select at least 3 credit hours from each package below</b> |            |   |                        |           |       |               |
|---|------------|---|------------------------|-----------|-------|---------------|
| <b>1. Humanities Courses Package:</b>   |            |   |                        |           |       |               |
| Course Code   | Course No. | Course Name                               | Number of Credit Hours |           |       | Pre-requisite |
|   |            |   | Theoretical            | Practical | Total |               |
| HUM   | 101        | Basic of Mass Communication               | 3                      | –         | 3     | –             |
| HUM   | 104        | Arts and Behaviors                        | 3                      | –         | 3     | –             |
| HUM   | 105        | Jordan Contribution to human Civilization | 3                      | –         | 3     | –             |
| HUM   | 106        | Introduction to Human Cultural Studies    | 3                      | –         | 3     | –             |
| HUM   | 107        | Human Rights                              | 3                      | –         | 3     | –             |
| HUM   | 109        | Islamic Systems                           | 3                      | –         | 3     | –             |
| HUM   | 110        | The Culture of Tourism and Hospitality    | 3                      | –         | 3     | –             |
| HUM   | 113        | Islamic Educational Thinking              | 3                      | –         | 3     | –             |
| HUM   | 115        | Legal Education                           | 3                      | –         | 3     | –             |
| HUM   | 123        | Performing Arts                           | 3                      | –         | 3     | –             |
| <b>2. Social Science Courses Package:</b>   |            |   |                        |           |       |               |
| HUM   | 102        | Citizenship and Allegiance                | 3                      | –         | 3     | –             |
| HUM   | 103        | Islamic: Intellect & Civilization         | 3                      | –         | 3     | –             |
| HUM   | 108        | Thinking Skills                           | 3                      | –         | 3     | –             |
| HUM   | 111        | History of Jerusalem                      | 3                      | –         | 3     | –             |
| HUM   | 112        | Geography of Jordan                       | 3                      | –         | 3     | –             |
| HUM   | 114        | Good Governance and integrity             | 3                      | –         | 3     | –             |
| HUM   | 116        | Ancient Writings of Jordan                | 3                      | –         | 3     | –             |
| HUM   | 122        | Economy and Society                       | 3                      | –         | 3     | –             |
| SCI   | 103        | Physical Education for All                | 3                      | –         | 3     | –             |
| SCI   | 104        | Effective Communication Skills            | 3                      | –         | 3     | –             |
| SCI   | 106        | Management and Society Development        | 3                      | –         | 3     | –             |
| <b>3. Package of Scientific and Technological Courses:</b>  |            |   |                        |           |       |               |
| SCI   | 102        | Information Technology and Society        | 3                      | –         | 3     | –             |
| SCI   | 105        | Renewable Energy                          | 3                      | –         | 3     | –             |
| SCI   | 107        | Scientific Research                       | 3                      | –         | 3     | –             |
| SCI   | 108        | Digital Culture                           | 3                      | –         | 3     | –             |
| SCI   | 110        | Development and environment               | 3                      | –         | 3     | –             |
| SCI   | 111        | Epidemiology and community immunity       | 3                      | –         | 3     | –             |

| Third: Faculty Compulsory Courses (21) Credit Hours |            |                               |                        |           |       |               |
|---|------------|-------------------------------|------------------------|-----------|-------|---------------|
| Course Code   | Course No. | Course Name                   | Number of Credit Hours |           |       | Pre-requisite |
|   |            |                               | Theoretical            | Practical | Total |               |
| MATH  | 101        | Calculus (1)                  | 3                      | -         | 3     |               |
| PHYS  | 101        | General Physics (1)           | 3                      | -         | 3     |               |
| CHEM  | 101        | General Chemistry (1)         | 3                      | -         | 3     |               |
| BIO   | 101        | General Biology               | 3                      | -         | 3     |               |
| STAT  | 101        | Principles of Statistics (1)  | 3                      | -         | 3     |               |
| EES   | 101        | General Geology (1)           | 3                      | -         | 3     |               |
| CS  | 110        | Selected Programming Language | 3                      | -         | 3     |               |
| Fourth: Faculty Elective Courses (0) Credit Hours   |            |                               |                        |           |       |               |
| Course Code   | Course No. | Course Name                   | Number of Credit Hours |           |       | Pre-requisite |
|   |            |                               | Theoretical            | Practical | Total |               |
|   |            |                               |                        |           |       |               |

| Fifth: Department Compulsory Courses (65) Credit Hours |            |                                 |                        |           |       |                        |
|--|------------|---------------------------------|------------------------|-----------|-------|------------------------|
| Course Code  | Course No. | Course Name                     | Number of Credit Hours |           |       | Pre-requisite          |
|  |            |                                 | Theoretical            | Practical | Total |                        |
| BIO  | 102        | General Biology (2)             | 3                      | -         | 3     | BIO 101                |
| CHEM   | 102        | General Chemistry (2)           | 3                      | -         | 3     | CHEM 101               |
| BIO  | 105        | General Biology Practical (1)   | -                      | 3         | 1     | BIO 101 or concurrent  |
| CHEM   | 105        | General chemistry Practical (1) | -                      | 3         | 1     | CHEM 101 or concurrent |
| BIO  | 106        | General Biology Practical (2)   | -                      | 3         | 1     | BIO 105                |
| CHEM   | 106        | General chemistry Practical (2) | -                      | 3         | 1     | -                      |
| BIO  | 107        | General Biology (3)             | 3                      | -         | 3     | BIO 106 or concurrent  |
| SCC  | 103        | Organic chemistry               | 3                      | -         | 3     | -                      |
| CHEM   | 216        | Organic chemistry practical     | -                      | 6         | 2     | -                      |
| BIO  | 215        | Invertebrate Zoology            | 2                      | 3         | 3     | BIO 102                |

|     |     |                                |   |   |   |                    |
|-----|-----|--------------------------------|---|---|---|--------------------|
| BIO | 216 | Comparative Vertebrate Anatomy | 2 | 3 | 3 | BIO 102            |
| BIO | 221 | Plant Anatomy                  | 2 | 3 | 3 | BIO 107            |
| BIO | 227 | Plant morphology               | 2 | 3 | 3 | BIO 107            |
| BIO | 251 | Cell Biology                   | 3 | – | 3 | BIO102             |
| BIO | 304 | Biochemistry                   | 2 | 3 | 3 | SCC 103 & CHEM 216 |
| BIO | 317 | Developmental Biology          | 2 | 3 | 3 | BIO 216 & BIO 251  |
| BIO | 333 | Microbiology                   | 2 | 3 | 3 | Bio 304 & Bio 251  |
| BIO | 345 | Genetics                       | 2 | 3 | 3 | BIO 251            |
| BIO | 352 | Molecular Biology              | 2 | 3 | 3 | BIO 345            |
| BIO | 415 | Animal Physiology              | 2 | 3 | 3 | BIO 216            |
| BIO | 425 | Plant Physiology               | 2 | 3 | 3 | BIO 221& BIO 227   |
| BIO | 432 | Immunology                     | 2 | 3 | 3 | BIO 304& BIO 333   |
| BIO | 448 | Ecology                        | 2 | 3 | 3 | 216 BIO & 227BIO   |
| BIO | 453 | Biotechnology                  | 2 | – | 2 | BIO 345 & BIO 333  |
| BIO | 455 | Bioinformatics                 | 2 | 3 | 3 | BIO 352            |
|     |     |                                |   |   |   |                    |

| Sixth: Department Elective Courses (15) Credit Hours |            |                                  |                        |           |       |                   |
|--|------------|----------------------------------|------------------------|-----------|-------|-------------------|
| Course Code  | Course No. | Course Name                      | Number of Credit Hours |           |       | Pre-requisite     |
|  |            |                                  | Theoretical            | Practical | Total |                   |
| BIO  | 222        | Plant Taxonomy                   | 2                      | 3         | 3     | BIO 221 & BIO 227 |
| BIO  | 223        | Economic Botany                  | 3                      | –         | 3     | BIO 221           |
| BIO  | 229        | Medicinal Plant                  | 2                      | 3         | 3     | BIO 227 & BIO 107 |
| BIO  | 261        | Microtechnique                   | 1                      | 6         | 3     | BIO 215 & BIO 216 |
| BIO  | 305        | Radiation Biology                | 3                      | –         | 3     | BIO 251           |
| BIO  | 307        | Hematology                       | 2                      | 3         | 3     | BIO 304           |
| BIO  | 314        | Parasitology                     | 2                      | 3         | 3     | BIO 215           |
| BIO  | 319        | Reproductive Biology             | 3                      | –         | 3     | BIO 317           |
| BIO  | 341        | Evolution                        | 3                      | –         | 3     | BIO 216 & BIO 227 |
| BIO  | 346        | Human Genetics                   | 3                      | –         | 3     | BIO 345           |
| BIO  | 417        | Endocrinology                    | 3                      | –         | 3     | BIO 415           |
| BIO  | 444        | Cytogenetics                     | 2                      | 3         | 3     | BIO 345           |
| BIO  | 452        | Assisted Reproductive Technology | 3                      | –         | 3     | BIO 317           |
| BIO  | 456        | Cancer Biology                   | 3                      | –         | 3     | BIO 352           |

|     |     |                               |   |   |   |                     |
|-----|-----|-------------------------------|---|---|---|---------------------|
| BIO | 457 | Molecular Evolution           | 3 | - | 3 | BIO 341 & Bio 352   |
| BIO | 458 | Plant diversity and evolution | 3 | - | 3 | BIO 341 & BIO 227   |
| BIO | 461 | Histology                     | 2 | 3 | 3 | BIO 216             |
| BIO | 492 | Special Topics                | 3 | - | 3 | Department approval |
| BIO | 499 | Research Project              | 3 | - | 3 | Department approval |
|     |     |                               |   |   |   |                     |

| Seventh: Specialization Compulsory Courses (6) Credit Hours |            |                             |                        |           |       |               |
|---|------------|-----------------------------|------------------------|-----------|-------|---------------|
| Course Code   | Course No. | Course Name                 | Number of Credit Hours |           |       | Pre-requisite |
|   |            |                             | Theoretical            | Practical | Total |               |
| STAT  | 111        | Principles of Probability 1 | 3                      | -         | 3     | -             |
| STAT  | 372        | Applied Biostatistics       | 3                      | -         | 3     | -             |
| EES   | 102        | Environmental Geology       | 3                      | -         | 3     | -             |
| EES   | 363        | Ecosystem Management        | 3                      | -         | 3     | -             |
| CHEM  | 231        | Analytical Chemistry (1)    | 3                      | -         | 3     | -             |
|   |            |                             |                        |           |       |               |

- Second: Major / Minor
  1. Department Obligatory Courses (65 Credit Hours according to table fifth above).
  2. Minor (21 Credit Hrs.) to be selected from any department of the following Faculties: Science, Information Technology and Computer Sciences according to their lists of minor courses of the selected department.
- Third: Minor in Biology (21 Credit Hrs)
  - A. Obligatory courses (15 Credit Hrs.)

| Fifth: Department Compulsory Courses (15) Credit Hours |            |                     |                        |           |       |               |
|--|------------|---------------------|------------------------|-----------|-------|---------------|
| Course Code  | Course No. | Course Name         | Number of Credit Hours |           |       | Pre-requisite |
|  |            |                     | Theoretical            | Practical | Total |               |
| BIO  | 102        | General Biology (2) | 3                      | -         | 3     | -             |
| BIO  | 107        | General Biology (3) | 3                      | -         | 3     | -             |



|     |     |                   |   |   |   |   |
|-----|-----|-------------------|---|---|---|---|
| BIO | 251 | Cell Biology      | 3 | – | 3 | – |
| BIO | 345 | Genetics          | 2 | 3 | 3 | - |
| BIO | 415 | Animal Physiology | 2 | 3 | 3 | - |

B. Elective courses (6 Credit Hrs.), student can select them from the following courses:

| Ninth: Department Compulsory Courses (6) Credit Hours |            |                      |                        |           |       |                    |
|---|------------|----------------------|------------------------|-----------|-------|--------------------|
| Course Code   | Course No. | Course Name          | Number of Credit Hours |           |       | Pre-requisite      |
|   |            |                      | Theoretical            | Practical | Total |                    |
| BIO   | 215        | Invertebrate Zoology | 3                      | –         | 3     | –                  |
| BIO   | 227        | Plant morphology     | 2                      | 3         | 3     | BIO 107            |
| BIO   | 304        | Biochemistry         | 2                      | 3         | 3     | SCC 103 & CHEM 216 |
| BIO   | 333        | Microbiology         | 2                      | 3         | 3     | Bio 304 & Bio 251  |
| BIO   | 425        | Plant Physiology     | 2                      | 3         | 3     | BIO 221& BIO 227   |
| BIO   | 448        | Ecology              | 2                      | 3         | 3     | 216 BIO & 227BIO   |