Faculty of Life Sciences

Institute of Bio-Chemistry
Department of Botany
Department of Microbiology
Department of Zoology
1. Introduction

1.1. The Institute of Biochemistry, was established in 1986 initially as a research Institute entertaining only M.Phil / Ph.D students. Later in 1991 M.Sc. Program in Biochemistry was started. In 2006, BS (4 years) program in Biochemistry and Biotechnology has also been started.

1.2. Biochemistry seeks to understand & explain living systems at the molecular level. It is a scientific discipline that finds applications across the Biomedical & Biological sciences & underpins the Biotechnology revolution. It is developing at a rapid pace and have become an exciting and challenging subject.

1.3. Biochemistry tries to answer questions that are fundamental to life. What are the molecules that constitute living organisms? How are they made & how is their synthesis regulated? How are they organized into cells? How they interact with each other and how is their synthesis regulated? What is the molecular basis of such processes as genetic inheritance, immunological recognition of self & non- self? What goes wrong to cause human diseases such as Cancer, Heart attacks, Alzheimer and Diabetes and how can such errors be corrected? This knowledge finds practical application in Medicine, Agriculture, Brewing and Biotechnology. Biochemists devise new ways of diagnosing & treating human, animal and plant diseases.

2. Objectives

2.1. To prepare graduates in modern Biological Science such as Biochemistry/ Biotechnology who are able to make a valuable beginning to many different careers in their practical life.

2.2. To emphasis research program exploring variety of technically feasible projects having socioeconomic importance, so as to be on the front line in solving our own problems in the area of Biological Sciences.

2.3. To provide Educational programs which encourage students to think creatively, constructively and to communicate their ideas effectively.

2.4. To foster an environment that promotes learning through quality teaching and research while encouraging mutual respect, tolerance and sensitivity.

2.5. To provide qualified and focused professionals in the subject of Bio Chemistry to meet the future needs of educational institutes and industry.

2.6. To prepare researchers to meet the needs of industry and research organizations, science and technology.

3. Vocational Job Opportunities/Marketability of Graduates

3.1. Pharmaceutical /food industries.

3.2. Public/Private research Institutes/Centers relating to Medical and Agriculture

3.3. Educational Institutions-College/University level.

3.4. Balochistan at present has become an active of socio-economic field. It is expanding its infrastructure and encourages development of industry. Numerous Food & Pharmaceutical Industries are recently established in Hub. The PCSIR laboratory in Quetta is currently being expanded creating new job opportunities. In the teaching sector, a number of new Universities and Colleges in Balochistan are offering opportunities to Biochemistry graduates. At National level also, research in Biomedical Sciences is attracting attention.

4. Faculty

4.1. The Institute has two main functioning units i.e Biochemistry and Biotechnology. In addition to this there are two units i.e Analytical Biochemistry and Bioorganic Chemistry to support the main units. The faculty of the Institute of Biochemistry is highly qualified and experienced. Details are given below.
5. Programs of Study

5.1. M.Sc. Biochemistry

5.1. Two years program under the annual system.

5.2. M.Sc Program of Studies

5.2.1. M.Sc Previous

5.2.1.1 Biochemistry (Paper I)
5.2.1.1.1 Introduction to Biochemistry
5.2.1.1.2 Similarities of Eukaryotic & Prokaryotic cells.
5.2.1.1.3 Chemistry & Biological function of Biomolecules.
5.2.1.1.4 Biological fluids.
5.2.1.1.5 Enzymes.
5.2.1.1.6 Metabolism
5.2.1.1.7 Nutrition Principle of Nutrition

5.3.1 Bio-Organic (Paper II)
5.3.1.1 Introduction to general Organic Chemistry
5.3.1.2 Chemistry of Carbohydrates.
5.3.1.3 Chemistry of amino acids.
5.3.1.4 Chemistry of nucleotides, nucleosides and their polymers.
5.3.1.5 Chemistry of lipids.
5.3.1.6 Biodegradable polymers.

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<table>
<thead>
<tr>
<th>S.No</th>
<th>Name</th>
<th>Designation</th>
<th>Qualification</th>
<th>Field of Specialization</th>
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<tbody>
<tr>
<td>1</td>
<td>Dr. Masoom Yasinza</td>
<td>Professor</td>
<td>Ph.D (UK)</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>2</td>
<td>Prof. Dr. M. Anver Panazai</td>
<td>Professor / Director</td>
<td>Ph.D (UoB)</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>3</td>
<td>Dr. Muhammad Azam</td>
<td>Associi: Professor</td>
<td>Ph.D (UK)</td>
<td>Polymers Science</td>
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<tr>
<td>4</td>
<td>Mr. Zahid Mehmood</td>
<td>Assistant Professor</td>
<td>M.Phil (UoB)</td>
<td>Biochemistry</td>
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<tr>
<td>5</td>
<td>Mr. Khalid Mehmood</td>
<td>Assistant Professor</td>
<td>M.Phil (UoB)</td>
<td>Biochemistry</td>
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<td>6</td>
<td>Dr. Ashif Sajjad</td>
<td>Assistant Professor</td>
<td>Ph.D (Italy)</td>
<td>Biochemistry</td>
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<tr>
<td>7</td>
<td>Dr. Dildar Ali</td>
<td>Assistant Professor</td>
<td>Ph.D (KU)</td>
<td>Organic Chemistry</td>
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<tr>
<td>8</td>
<td>Dr. Muhammad Ayub</td>
<td>Assistant Professor</td>
<td>Ph.D. (UoB)</td>
<td>Molecular Biology/Biochemistry</td>
</tr>
<tr>
<td>9</td>
<td>Mr. M. Sharif Jamali</td>
<td>Lecturer</td>
<td>M.Sc.(QAU)</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>10</td>
<td>Mr. Muhammad Hashim Jan</td>
<td>Lecturer</td>
<td>M.Sc.(UoB)</td>
<td>Biochemistry</td>
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<tr>
<td>11</td>
<td>Mrs. Pari Gul</td>
<td>Lecturer</td>
<td>M.Sc. (UoB)</td>
<td>Biochemistry</td>
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<tr>
<td>12</td>
<td>Ms. Samira Khaliq</td>
<td>Lecturer</td>
<td>M.Sc.(UOB)</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>13</td>
<td>Ms. Shahida Hussain</td>
<td>Lecturer</td>
<td>M.Sc. (QAU)</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>14</td>
<td>Mr. Sharif Hasni</td>
<td>Lecturer</td>
<td>MS. Sweden</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>15</td>
<td>Mr. Zia ur Rehman</td>
<td>Lecturer</td>
<td>MS (AIT)</td>
<td>Biochemistry</td>
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<tr>
<td>16</td>
<td>Mr. Imran Ali</td>
<td>Lecturer</td>
<td>MS (AIT)</td>
<td>Biochemistry</td>
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<tr>
<td>17</td>
<td>Mr. Noor Hassan</td>
<td>Lecturer</td>
<td>M.Sc. (UOB)</td>
<td>Biochemistry</td>
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<tr>
<td>18</td>
<td>Mr. Aamir Rasool</td>
<td>Lecturer</td>
<td>M.Sc.(KU)</td>
<td>Biochemistry</td>
</tr>
</tbody>
</table>
5.4.1. **Bio-Analytical (Paper III)**
5.4.1.1 Introduction to spectroscopy
5.4.1.2 Chromatography
5.4.1.3 Environmental Bio-analytical
5.4.1.4 Electrochemical techniques.
5.4.1.5 Radiochemical methods.
5.4.1.6 Statistics & Mathematics for Biochemistry

5.4.2. **Molecular Biology (Paper IV)**
5.4.2.1 Chemistry and Biochemistry of Nucleic acids.
5.4.2.2 Chromosome structure and functions
5.4.2.3 DNA replication.
5.4.2.4 Transcription and its mechanism.
5.4.2.5 Translation, genetic code, transnational process.
5.4.2.6 Gene expression.
5.4.2.7 Molecular basis of Mutations.
5.4.2.8 Biology of Cancer.
5.4.2.9 Repair of DNA.

5.5. **English Functional.**

6.3 M.Sc Final year.
6.3.1. **Contemporary Biochemistry (Paper 1)**
6.3.1.1 Genomics.
6.3.1.2 Biochemistry of Genetic Engineering.
6.3.1.3 Microbial Biochemistry.
6.3.1.4 Vaccine and Molecular Diagnostics
6.3.1.5 Structure and functions of Glycoconjugates.

6.3.2. **Current Trends in Biochemistry (Paper II)**
6.3.2.1 Protein Engineering.
6.3.2.2 Endocrinology.
6.3.2.3 Chemotherapy
6.3.2.4 Hematology.

6.3.3. **Specialized Topics (Paper III)**
6.3.3.1 Advanced Immunology.
6.3.3.2 Advanced Clinical Biochemistry.

6.3.4. **Thesis/ Practicals (Paper IV)**
6.3.4.1 Research work
   (Literature Search, Experimental Work, Thesis writing)
7. M.Phil & Ph.D in Biochemistry & Biotechnology
The entry to M.Phil / Ph.D. Program is through NTS qualifying Exam. M.Phil degree program comprises of two semester course work of 24 credit hours and 6 credit hours of research / dissertation and Seminar. Ph.D course has been designed in the line with International GRE course to cover 18 credit hours in total. Each course is of 3 credit hours and it spreads on two semester. Institute of Biochemistry runs regular classes of M.Phil / Ph.D 1st 2nd semester in the evening.

7.2.1. First Year

7.2.1.1. Semester-1

<table>
<thead>
<tr>
<th>Course 1</th>
<th>Chemistry of Biomolecules</th>
<th>3 Cr. hrs.</th>
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<tr>
<td>Course 2</td>
<td>Membrane Biochemistry.</td>
<td>3 Cr. hrs</td>
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<td>Course 3</td>
<td>Recombine net DNA technology.</td>
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<tr>
<td>Course 3</td>
<td>Metabolism. (Optional)</td>
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Total Cr. hrs. 12 Cr. Hrs

7.1.1.2. Semester-2

<table>
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<tr>
<th>Course 1</th>
<th>Bioanalytical techniques.</th>
<th>3 Cr. hrs</th>
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<tr>
<td>Course 2</td>
<td>Spectroscopy (Optional)</td>
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<tr>
<td>Course 2</td>
<td>Advanced cell biology</td>
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<tr>
<td>Course 3</td>
<td>Optional paper (Optional)</td>
<td>3 Cr hrs</td>
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</table>

Total Cr. hrs. 12 Cr. Hrs

7.2.2. Second Year

7.2.2.1. Semester III & IV

7.2.2.2. Seminar I

7.2.2.3. Seminar II

7.2.2.4. Dissertation/ Research 6 Cr hrs

7.3. Ph.D. Program of studies

7.3.1 First Year

7.3.1.1 Semester-I

<table>
<thead>
<tr>
<th>Course I</th>
<th>Biochemistry-I</th>
<th>3Cr. hrs</th>
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<tr>
<td>Course II</td>
<td>Cellular Biology</td>
<td>3CR. hrs</td>
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<tr>
<td>Course III</td>
<td>Molecular Biology &amp; Genetics (Optional)</td>
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Total Cr. hrs. 09.Cr.hrs.

7.3.2. Second Year

<table>
<thead>
<tr>
<th>Course IV</th>
<th>Advanced Molecular Biology</th>
<th>3 Cr. hrs</th>
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</thead>
</table>

A. Genomics.
B. Genome Maintenance
C. Gene Expression
D. Gene Regulation in Eukaryotes.
E. Bacteriophage & Animal & Plant Viruses.

**Course V.**  
**Protein Chemistry**  
3 Cr. hrs  
A. Protein Synthetic & Processing  
B. Cell Division, Differentiation & Development

**Course VI**  
**Protein Chemistry.**  
Protein Synthesis & Processing.

**Course VII.**  
**Biochemistry-II**  
Optional  
3 Cr. hrs  
A. Major Metabolic Pathways  
B. Bioenergetics (including respiration and photosynthesis)  
C. Regulation and Integration of Metabolism  
D. Catalysis and Binding

**Total Cr. hrs. 09. Cr. Hrs**

7.4 **Second Year**

7.4.1 Semester III & IV  
7.4.2 Seminar - I  
7.4.3 Seminar-II  
7.4.4 Seminar-III  
7.4.5 Dissertation / Research

8. **Eligibility Criteria for Admission**

8.1. **M.Sc. (2 years)**

8.1.1. B.Sc. With Chemistry & Biology (Second Division)

8.2. **M.Phil/Ph.D**

8.2.1.1. For M.Phil, M.Sc and for PhD M.Phil/MS in a Chemical/Biological Science Subjects, along with NTS qualifying exams.

9. **Number of Seats Available (35 Thirty Five)**

9.1.1. The Total number of seats in each program of study including all categories of reserved seats shall be 35 (thirty five). The distribution of seats in each department is as under:-

9.1.2 **Local and Domicile of Balochistan - Category “A”**

- Open merit: Balochistan 10% 03
- Open merit Quetta District 15% 04
- Open merit: District other than Quetta 75% 23

9.1.3 **Personnel Serving in Balochistan - Category “B”**

(Non-Local & Non Domicile) Daughter/Son/spouse 02

9.1.4 **University Employees/Nominees of AJK, Armed Forces/ Northern Areas/FATA and Federal School/ Reserved Seats for Disabled - Category “C”**

- Daughter/Son/Spouse 03

**Total Seats** 35

73
11. Achievements
11.1. Our excellence in both teaching & research has been recognized by the quality assurance & the research assessment exercise by the Pakistan Council for Science & Technology.

12. Future Plans
12.1. The Institute has already envisioned its 2020 plan whereby this Institute will be strengthened and equipped so that it turns into a full fledged School of Biological Sciences with established setups for:

12.1.1. Biochemistry & Molecular Biology
12.1.2. Biotechnology and Bio-informatics
12.1.3. Biochemical Parasitology

12.1.4. Drugs Development

12.1.5. Clinical Biochemistry.

12.1.6. To achieve this we have already embarked upon the strengthening of our faculty and the in-service training of our teachers.
1. Introduction

1.1. Botany is the scientific study of plants and fungi. Plants are a vital component of the biosphere and are directly responsible for the conditions required for life on earth. Plant life can be studied from different perspectives, from the molecular, genetic and biochemical level through organelles, cells, tissues, organs, individuals, populations, and communities of plants. Plants are also the mainstay of human and animal diets and provide medicines, timber, paper, clothing and energy.

1.2. The Department of Botany was established in year 1979. Initially it was working as a Department of life sciences and later on started functioning separately as Department of Botany from March, 1980. It is responsible to impart training in the field of plant sciences at undergraduate and post graduate level. The academic program comprises up of courses leading to M.Sc. degree as well as research for M.Phil and Ph.D. degrees and independent research projects undertaken by the faculty members.

2. Objectives

2.1. To prepare graduates and highly qualified focused professionals in the subject of Botany to meet the future needs of educational institutions / research organizations / forestry / horticulture / agriculture.

2.2. To prepare researchers to meet the need of industry, science and technology.

2.3. To provide educational programs which encourage students to think creatively, constructively and to communicate their ideas and skills effectively.

2.4. To foster an environment that promotes learning through quality teaching and research while encouraging mutual respect, tolerance and sensitivity.

3. Vocational Job Opportunities / Marketability of Graduates

3.1. Educational Institutes, Colleges and Universities and Research Institutes

3.2. Pharmaceutical Industry and Fertilizer Industry


3.5. Public/Private Research Organizations.

4. Faculty

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name</th>
<th>Designation</th>
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<th>Specialization</th>
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<tr>
<td>1</td>
<td>Dr. Rasool Bakhsh Tareen</td>
<td>Professor (TTS)/Dean Life Sciences</td>
<td>Ph.D</td>
<td>Plant Taxonomy &amp; Systematics</td>
</tr>
<tr>
<td>2</td>
<td>Dr. A.K.K. Achakzai</td>
<td>Professor (TTS)/Chairperson</td>
<td>Ph.D</td>
<td>Plant Physiology &amp; Biochemistry</td>
</tr>
<tr>
<td>3</td>
<td>Dr. Atta M. Sarangzi</td>
<td>Associate Professor</td>
<td>Ph.D</td>
<td>Plant Ecology</td>
</tr>
<tr>
<td>4</td>
<td>Dr. Saeed-ur-Rehman</td>
<td>Associate Professor</td>
<td>Ph.D</td>
<td>Taxonomy &amp; Environmental Biology</td>
</tr>
<tr>
<td>5</td>
<td>Mrs. Gul Bano</td>
<td>Assistant Professor</td>
<td>M.Phil</td>
<td>Genetics</td>
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</table>
5. Programs of Study

5.1. M.Sc. (2 years)

5.2. M.Phil and Ph.D (2 and 3 years)

6. Description of Courses

6.1. All six courses in M.Sc. previous (1st year) are compulsory, whereas four courses are compulsory in M.Sc final year. However, M.Sc final year students also have to opt one optional paper in various disciplines of Botany i.e. Plant Physiology, Ecophysiology, Plant Biochemistry, Phycology, Advance Ecology, Advanced Taxonomy, Advance Genetics, Molecular Biology, Economic Botany, Introductory Bioinformatics and Genomics, Applied Ecology (Dendrochronology) and Soil Ecology etc.

6.2. M.Sc. (Previous) Course Work:

Courses offered in M.Sc. (Previous).

<table>
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<th>Title</th>
<th>Marks</th>
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<td>Theory</td>
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<td>Practical</td>
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<tr>
<td>1</td>
<td>Phycology, Bryology &amp; Research Methodology</td>
<td>75</td>
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<tr>
<td>2</td>
<td>Bacteriology, Virology, Mycology &amp; Plant Pathology</td>
<td>75</td>
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<tr>
<td>3</td>
<td>Plant Physiology</td>
<td>75</td>
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<tr>
<td>4</td>
<td>Plant Ecology</td>
<td>75</td>
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<tr>
<td>5</td>
<td>Plant Systematic, Biodiversity and Conservation</td>
<td>75</td>
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<tr>
<td>6</td>
<td>Plant Anatomy and Diversity of Vascular Plant</td>
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6.3. M.Sc. (Final) Course Work:

Courses offered in M.Sc. (Final).

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<td>Theory</td>
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<tr>
<td>7</td>
<td>Genetics</td>
<td>75</td>
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<tr>
<td>8</td>
<td>Plant Biochemistry</td>
<td>75</td>
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<tr>
<td>9</td>
<td>Environmental Biology &amp; Biostatistics</td>
<td>75</td>
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<tr>
<td>10</td>
<td>Research Paper &amp; Presentation</td>
<td>70</td>
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<tr>
<td>11</td>
<td>Optional Paper (The students of final year will opt only one of the following courses) i.e. Plant Physiology, Ecophysiology, Plant Biochemistry, Advance Phycology, Advance Ecology, Advance Taxonomy, Advance Genetics, Molecular Biology, Economic Botany, Introductory Bioinformatics and Genomics, Applied Ecology (Dendrochronology) and Plant Soil System &amp; Environment etc.</td>
<td>75</td>
</tr>
</tbody>
</table>

6.4. M.Phil/PhD Course Work:

A candidate seeking admission in M.Phil/PhD needs to complete a minimum of 30 credit hours for M.Phil and 38 for PhD. Twenty four (24) credit hours will be reserved for course work of M.Phil and eighteen (18) for PhD. Whereas six (06) and twenty (20) credit hours are fixed for research work and thesis of M.Phil and PhD programs respectively. The core courses of fifteen (15) and twelve (12) credit hours are mandatory for all scholars seeking admission in M.Phil/PhD respectively. However, the Department offers the following courses for M.Phil/PhD scholars:
- Natural Resources Management & Land Evaluation
- Introduction to Biotechnology
- Advances in Molecular Biology
- Bioinformatics
- Recombinant DNA Technology
- Agro-Economic Botany
- Air Pollution & Air Quality Management
- Advances in Genomics & Proteomics
- Biodiversity & Conservation
- Plant-Soil System & Environment etc.

7. Eligibility Criteria for Admission

7.1. M.Sc.

7.1.1. Passed B.Sc. with Botany

7.1.2. Written test and interview to be qualified with 45% marks.

7.2. M.Phil/PhD.

For detail read the “Statues and Regulations Governing the M.Phil & PhD Programs” which can be obtained from the office of the registrar, University of Balochistan, Quetta.

8. Facilities

8.1. The Department is fully equipped with modern sophisticated equipments. The Department has a Seminar Library, Museum, Herbarium, Botanical Garden and Laboratories of Anatomy, Biochemistry, Ecology, Economic Botany, Environmental Biology, Molecular Biology, Phycology, Physiology and Taxonomy. Departmental Library has a large number of text and reference books and some back issues of various Journals of national and international repute.

8.1.1. Teaching Laboratories. The Department of botany has three General Laboratories along with the supporting staff to cater to the needs of M.Sc. Students.
8.1.2. **Research Laboratories.** Nine research Laboratories in the field of Plant Physiology, Phycology, Environmental Biology/Taxonomy, Genetics, Economic Botany/Anatomy, Ecology, Phytosociology and Dendrochronology have been developed with sophisticated equipments.

8.1.3. **Plant Tissue Culture Technology Laboratory.** It deals with the mass production of plants, under aseptic environment employing artificial growing conditions in glass (*In-vitro*). This important technology is based on the principle that production of genetically modified plant is only possible if the target species have a successful and efficient regeneration system. The success of modern Plant Biotechnology is attributed to this very important technique, which plays an important role in *in-vitro* propagation of disease free plants and multiplying with unmatched speed of endangered species as well as species of difficult to regenerate.


8.1.5. **Computer Laboratory.** Department has well established computer laboratory equipped with 24 Pentium IV computers, connected with 2 printers and photocopier, which can be used by research scholars and faculty.


8.1.7. **Internet Facility.** The internet facility is available. A large number of international research Journals are also available on Digital Library provided by Higher Education Commission (HEC) and research article of interest can also be down loaded.

8.1.8 **Research Journal.** The Department of Botany is associated with the International Society of Pure and Applied Biology (ISPAB) to publish a research journal entitled as “**Pure and Applied Biology (PAB)**”. PAB is an online, peer-reviewed; open-access scientific journal and is devoted to publish selected papers of latest advancement dealing with original research in the field of Biology. It is published quarterly per year. The aim of the PAB journal is to offer a platform for research students/scientists and academicians all over the world to promote, share and discuss various new issues and developments in different areas of Biology. **Dr. Muhammad Younas Khan Barozai** is the Editor-in-Chief of the PAB.
1. Introduction

1.1. Microbiology is the study of microorganisms; include Bacteria, Fungi, Viruses, and Protozoa etc. (both useful and harmful for human beings Plants and fish etc.) through applying different scientific techniques, microorganisms and microbial enzymes can be used in industrial processes to carry out reactions that are not economically feasible by chemical means. Microbiology offers the possibility of major improvements in the way medicines are developed and manufactured.

1.2. Microbiologists are employed principally in health care (animal and Human beings), fine chemicals, brewing & distilling, food and food related industries, where they are involved in research and development, in process design & control, in management and in quality control. Therefore, various disciplines of Microbiology are prime choice of men and women, mainly because of its laboratory-based activities.

1.3. The Department of Microbiology was established in May 2006 and is aimed at the production of marketable and qualified product capable of finding solution / remedies against prevalent and new emerging diseases, production of different vaccines and preservation of different foods etc. through research and development.

2. Objectives

2.1. To foster an environment that promotes learning through quality teaching and research while encouraging mutual respect, tolerance and sensitivity.

2.2. To provide qualified and focused professionals in the subject of Microbiology to meet the future needs of educational institutes and/or industries.

2.3. To prepare researchers to meet the needs of industry and research organizations, science and technology.

2.4. To develop the department as a nursery for the advanced level degree program at other institutions particularly in the province of Balochistan.

3. Vocational Job Opportunities / Marketability of Graduates

3.1. Food packaging and processing industry
3.2. Quality control operations of safe drinking water
3.3. Public Health Institutions
3.4. Pharmaceutical Industry
3.5. Diagnostic Laboratory Technicians / Experts
3.6. Biological production industry
3.7. Biotechnological interventions in environmental sciences like Bioremediation

4. Faculty

4.1 The details of faculty members is as under:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name</th>
<th>Designation</th>
<th>Qualification</th>
<th>Field of Specialization</th>
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<tbody>
<tr>
<td>1</td>
<td>Dr. Abdul Malik Tareen</td>
<td>Assistant Professor / Chairperson</td>
<td>Ph.D</td>
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<tr>
<td>2</td>
<td>Mr. Abdul Wadood</td>
<td>Assistant Professor</td>
<td>M.Phil</td>
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<tr>
<td>3</td>
<td>Mr. Kifayatullah</td>
<td>Lecturer</td>
<td>M.Phil</td>
<td>Microbiology</td>
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</table>
5. Programs of Study

5.1. M.Sc. (2 years) (eligibility)

5.2. Students (Male/Female) with at least 2nd division in B.Sc (Zoology, Botany, Bio-chemistry and organic chemistry) are eligible to apply for two years M.Sc program under the annual system.

6. Description of Courses

6.2 MSc-2 Year Program

6.2.1 M.Sc Previous

6.2.1.1 Paper-I General Microbiology
6.2.1.2 Paper-II Microbial Genetics
6.2.1.3 Paper-III General Immunology
6.2.1.4 Paper-IV Introduction to Mycology (3 hours)
6.2.1.5 Paper-V Environmental Microbiology & Biostatistics
6.2.1.6 Paper-VI General Virology & Cell Culture
6.2.1.7 Paper-VII English Functional

6.2.2 M.Sc Previous

6.2.2.1 Paper-I Diagnostic Microbiology
6.2.2.2 Paper-II Soil Microbiology
6.2.2.3 Paper-III Marine Microbiology
6.2.2.4 Paper-IV Medical Microbiology
6.2.2.5 Paper-V Biotechnology & Bioinformatics
6.2.2.6 Paper-VI Research Report / Thesis

7. Facilities

7.1. Teaching Laboratories: - A laboratory has been established at the Department of Microbiology to teach basic techniques in bacteriology, immunology virology, hematology and mycology. The laboratories of the Department Zoology are being shared for teaching different microbiological techniques, where desired equipment and other required facilities are available.

7.2. Research Laboratories: - The research laboratories of CASVAB are being utilized for the research projects till the establishment of full-fledged research laboratories with required facilities become available at the Department of Microbiology.

7.2.1. Research is carried out in the fields/area of:-

- Bacteriology
- Virology
- Mycology
- Immunology
- Molecular Biology
- Public Health problems
- Disease Diagnosis (Viral, Bacterial, Fungal & Protozoan)
- Biological Product (vaccines etc) production
- Serology & modern diagnostic/research techniques
- Food preservation techniques
- Drugs efficacy against diseases.
7.3 **Computer Laboratory:** The central computer laboratory of the University is located in the department of Physics and could also be used by research scholars/teachers of other departments. An independent computer laboratory has also been established at the Department where the students are also allowed to avail the facility to acquaint with latest available knowledge through internet facility.

7.4 **Department Library:** A department library has been established and about 100 books on different topic of basis microbiology subjects are available for the students. Purchase of relevant books is in progress. Facility of Central Library has also been extended to the students, to increase their desired knowledge. Further, the library of CASVAB has all the relevant text/reference books and laboratory manual concerning to the subject which are also made available for the students enrolled at the Department of Microbiology.

7.5 **Internet Facility:** 10 Computers along with internet facility are available at the Department and students are allowed to use the internet after university timings.

7.6 **Journals and Articles:** A large number of international research journals and articles are also available on Digital Library provided by here Higher Education Commission and facility has been extended to the students for downloading research articles etc.

7.7 **Multimedia and overhead Projector Facility:** For teaching subjects on modern lines facility of Overhead project is available at the department.
1. Introduction

1.1. Zoology is the study of organisms and their surrounding environment. Basically it is a combination of various disciplines such as Genetics, Physiology, Ecology, Developmental Biology, Microbiology, Parasitology, Entomology, Limnology, Fisheries and Wildlife etc. It plays a pivotal role in socio-economic alleviation of poverty and in human resource development.

1.2. Department of Zoology is one of the oldest departments, started since 1979 under the Chairmanship of Doctor Maqsood Ali, Ph.D (USA). It is offering graduate, post graduate and Doctoral programmes in various disciplines of Zoology.

2. Objectives

2.1. To provide qualified and focused professionals in the subject of Zoology to meet the future needs of educational institutes, industry and society.

2.2. To prepare researchers to meet the needs of industry and research organizations, science and technology.

2.3. To impart knowledge of major disciplines of Zoology, enabling the students to understand the principles of organization and inter-relationship in the Biological Systems with particular references to Animal diversity.

2.4. To teach different methods to exploration, investigations, organization to data and its utilization in practical life.

2.5. To equip students with knowledge and skill for better planning and management of Animal resources, Environment, Health, Medicine, Agriculture and pest control.

2.6. To provide educational programs, which encourage students to think creatively.

2.7. To foster an environment that promotes learning through quality teaching and research while encouraging mutual respect, tolerance and sensitivity.

3. Vocational Job Opportunities/Marketability of Graduates

3.1. Teaching and Research in public and private organizations.

3.2. Forestry, Agriculture and Biological Control Programmes.

3.3. Integrated Pest Management.

3.4. Poultry, Fisheries and livestock Industry.

3.5. Wildlife Management and Conservation, Government/NGO.

4. Faculty

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name</th>
<th>Designation</th>
<th>Qualification</th>
<th>Field of Specialisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dr. Asmatullah Kakar</td>
<td>Professor / Chairperson</td>
<td>Ph.D</td>
<td>Parasitology / Entomology</td>
</tr>
<tr>
<td>2</td>
<td>Dr. Rehana Mushtaq</td>
<td>Assistant Professor</td>
<td>Ph.D</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>3</td>
<td>Dr. M. Iqbal Yasinzai</td>
<td>Associate Professor</td>
<td>Ph.D</td>
<td>Entomology / Parasitology</td>
</tr>
<tr>
<td>4</td>
<td>Dr. Asim Iqbal</td>
<td>Assistant Professor</td>
<td>Ph.D</td>
<td>Entomology / Immunology</td>
</tr>
<tr>
<td>5</td>
<td>Mr. Shahbuddin</td>
<td>Assistant Professor</td>
<td>M.Phil</td>
<td>Parasitology</td>
</tr>
<tr>
<td>6</td>
<td>Mr. Zahoor Ahmed</td>
<td>Lecturer</td>
<td>M.Phil</td>
<td>Parasitology</td>
</tr>
<tr>
<td>7</td>
<td>Mr. Faizullah Khan</td>
<td>Lecturer</td>
<td>M.Phil</td>
<td>Parasitology</td>
</tr>
<tr>
<td>8</td>
<td>Mr. Ghulam Dastagir</td>
<td>Lecturer</td>
<td>M.Phil</td>
<td>Fisheries / Limnology</td>
</tr>
<tr>
<td>9</td>
<td>Mr. Wali Muhammad</td>
<td>Assistant Professor</td>
<td>M.Phil</td>
<td>Fisheries / Parasitology</td>
</tr>
<tr>
<td>10</td>
<td>Mrs. Umbreen Shaheen</td>
<td>Lecturer</td>
<td>M.Sc.</td>
<td>Parasitology</td>
</tr>
<tr>
<td>11</td>
<td>Mr. Saeed Ahmed</td>
<td>Lecturer</td>
<td>M.Sc.</td>
<td>Entomology</td>
</tr>
<tr>
<td>12</td>
<td>Ms. Tahsen Ara</td>
<td>Lecturer</td>
<td>M.Sc.</td>
<td>Entomology</td>
</tr>
<tr>
<td>13</td>
<td>Mr. Kashif Kamran</td>
<td>Museum Curator</td>
<td>M.Sc.</td>
<td>Animal Science</td>
</tr>
</tbody>
</table>

5. Programs of Study

5.1. M.Sc 02 years duration (Annual System) Morning (Regular Classes) / Evening (Self Finance, approved by Academic council in its meeting held on 17 + 18 July 2012.

5.2 M.Phil 02 years duration (Term System) one term = 6 months.

5.3 Ph.D. 02-05 years as a regular student (Term System)

6. Description of Courses

6.1. **M.Sc Zoology (Previous)**

<table>
<thead>
<tr>
<th></th>
<th>Theory</th>
<th>Practical</th>
<th>Marks</th>
</tr>
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<tbody>
<tr>
<td>I.</td>
<td>Cell Biology and Biochemistry</td>
<td>75</td>
<td>25</td>
</tr>
<tr>
<td>II.</td>
<td>Animal Diversity and Wild Life</td>
<td>75</td>
<td>25</td>
</tr>
<tr>
<td>III.</td>
<td>Physiology and Animal Behavior</td>
<td>75</td>
<td>25</td>
</tr>
<tr>
<td>IV.</td>
<td>Genetics and Biostatistics</td>
<td>75</td>
<td>25</td>
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<tr>
<td>V.</td>
<td>Environmental Biology</td>
<td>75</td>
<td>25</td>
</tr>
<tr>
<td>VI.</td>
<td>Development Biology</td>
<td>75</td>
<td>25</td>
</tr>
<tr>
<td>VII.</td>
<td>Functional English</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
6.1. M.Sc Zoology (Final) Theory Prac. Marks

XIII. Evolution & Principles of Systematic Zoology 75 25 100
IX. Zoo-Geography & Paleontology 75 25 100
X. Special Paper A (Entomology/Parasitology/Fisheries) 75 25 100
XI. Special Paper B (Entomology/Parasitology/Fisheries) 75 25 100
XII. Economic Zoology 75 25 100
VIII. Insects of Medical & Veterinary Importance 75 25 100
XIV. Research and Presentation - - 100

Detail of special Paper A and Special Paper B

a. Parasitology A (Principals of Parasitology)

Parasitology B (Animal parasitology (Protozoology, Helminthology, veterinary & Medical entomology)

b. Entomology A (Morphology and Physiology & Social Behaviour of Insects)

Entomology B (Insects classification, pest control & Management)

c. Fisheries A (Fish Morphology & Eco-physiology)

Fisheries B (Aquaculture & Fisheries)

All courses in M.Sc. (previous) are compulsory, while specialization is offered in M.Sc. (final) in the above mentioned disciplines.

7. Eligibility Criteria for Admission

7.1. For M.Sc: Bachelor in Science with Zoology + Chemistry
7.2. For M.Phil: M.Sc Ist division / GAT(NTS) General.
7.3. For PhD: M.Phil with 3.0 CGP for Semester System and GAT subjective / for term system Ist division with GAT subjective.

8. Facilities

8.1. Computer Laboratory An air conditioned computer lab, for the student is established, comprising 24 computers along with printers and internet connectivity.

8.2. Departmental Library Departmental library under qualified librarian has more than 1450 books covering a wide range of disciplines in Zoology for teaching and research purposes are available.

8.3. Zoology Museum Full fledge wide range of collection including stuff animals and preserved animals for various respective courses are arranged.

8.4. All basic biological research facilities are available including Central Lab of Faculty of life Sciences.