DEPARTMENT OF BIOCHEMISTRY

Self Assessment Report
(2009-2010)

Program Self Assessment Team

Prof. Dr. S.M. Saqlan Naqvi (Coordinator)
Prof. Dr. Muhammad Gulfraz (Member)
Dr. Muhammad Javaid Asad (Member)
CONTENTS

Introduction 03
Criterion-1: Program Mission, Objectives and Outcomes 04
Criterion 2: Curriculum Design and Organization 121
Criterion 3: Laboratories and Computing Facilities 125
Criterion 4: Students Support and Advising 127
Criterion 5: Process Control 127
Criterion 7: Institutional Facilities 176
Criterion 8: Institutional Support 176

TABLES
Table-1: Programmes Objectives Assessment 05
Table-2: Objective vs Outcomes 06
Table-3: Quantitative Assessment of the Department 120
Table-3.1: Faculty Distribution in Biochemistry 120
Table-4: Present Performance Measures for Research Activities 121
Table-5: Scheme of studies for M.Sc, M.Phil and Ph.D 123
Table-6: Post Graduate Courses 123
Table-7: Curriculum Vs Program outcome 124
Table-8: Enrolment in Different Programs from 2001-2010 177

Annexure
Annexure I: Detailed course contents of degree programs 178
Annexure II: Result of Faculty Course Review/ Research Student Progress Form and Results of Faculty Survey 111
Annexure III: Graduating Students Survey 115

Summary 200
Conclusion 201
Introduction
The discipline of Biochemistry in PMAS-AAUR was introduced as a separate Department in 2003. Earlier it was under the umbrella of the Department of Biological Sciences, under which M.Sc. and Ph.D. degree programmes were started in 1998 and 2001 respectively. M.Phil degree programme was initiated in year 2006. The Department has highly competent and qualified faculty, most of whom by the Department of Biochemistry have post doctoral experience from reputable International Universities/Institutes and seven out of seven faculty members are HEC approved supervisors for Indigenous Ph.D. programme. The faculty has produced many publications in journals of international repute. The faculty members have specialization in the field of Biochemistry, Environmental Biochemistry, Molecular Biology, Biotechnology, Protein Chemistry and Enzymology. Presently the total strength of students in the Department is 193.

The courses offered for the degrees programs provide the students not only extensive exposure of basic Biochemistry but also of Molecular Biology and Biotechnology, to face the future challenges. As a result the Department has established good repute in a very short period of time. The Department has twelve HEC sponsored Ph.D students. To strengthen the academic and research activities, Department has an active collaboration with University of California Davis, USA and Iowa State University, Iowa, USA. The Department is further in process of developing active collaboration with Universities in UK.

The program of Biochemistry is designed to provide necessary skills and knowledge in applying biochemical and molecular approaches for solution of problems related to health, agriculture and environment.

With the latest development in the field of Biochemistry, the Department regularly updates its curriculum by keeping in view the recent advances in Biochemistry. The Department offers a variety of study programs to enhance students’ professional training and career opportunities. It regularly holds national and international training Workshop, Seminars to exchange knowledge and views. The faculty is actively engaged in a number of research projects; some of which are internationally collaborated and funded.
SECTION 1:

Components of Self Assessment Process:
This Self Assessment Report has been prepared on the basis of following eight criteria as described in Self Assessment Manual.

Criterion-1: Program Mission, Objectives and Outcomes

Introduction
The discipline of Biochemistry deals with the Molecular Biology, Genetic Engineering and Biotechnology. There are four main research domains in the Department, which are mainly focusing on the human and animal biochemistry, plant biotechnology and environment biotechnology.

Mission Statement of the Department of Biochemistry:
Mission of the Department of Biochemistry is to deliver quality teaching and to conduct basic and applied research.

Standard 1-1: Documented Measurable Objectives

1. To carry out teaching and research programs
2. To train young scientists and research students with advanced techniques in Biochemistry, Molecular Biology, Genetic Engineering and Biotechnology
3. To provide facilities for advanced research in Biochemistry, Molecular Biology and Biotechnology
4. To train academicians and scientists of other Universities and Institutes through seminars and workshops
5. To conduct scientific meetings/conferences/workshops/seminars to facilitate exchange of ideas between scientists and transfer of technology

Expected Outcomes

1. To produce different lot of students and researchers e.g. M.Sc, M.Phil and Ph.D in Biochemistry and Biotechnology.
2. To make the students and researchers able to handle the different techniques independently.
3. Different institutes and universities will be provided the facility of advance techniques for their research problems like Sequencer, GC, PCR, RT-PCR and Electrophoresis.
4. Approximately nine workshops have been organized since 2004
5. Different conferences have been organized to facilitate exchange of ideas.

Main Elements of Strategic Plan to Achieve Mission and Objectives

1. Post-graduate research with reports and theses
2. Setting up of well equipped specialized research laboratories depending on the available resources.
3. Development of a sound teaching system for the award of degrees based on the experience and vision gathered from world reviews, literature, innovations, proceedings, and symposia etc
4. Publication of scientific papers, books, manuals etc.
5. Designing and constantly updating the curricula involving core subjects, elective subjects and specialized areas and study tours.
6. Implementation of research projects funded by the universities and other agencies.
7. Development of linkages with National and International research organizations to faster research.
### TABLE-1: PROGRAM OBJECTIVES ASSESSMENT

<table>
<thead>
<tr>
<th>S. #</th>
<th>Objective</th>
<th>How Measured</th>
<th>When Measured</th>
<th>Improvement Identified</th>
<th>Improvement made</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To carry out teaching and research programs</td>
<td>On the basis of evaluation by students.</td>
<td>It is a continuous process as per requirement</td>
<td>Course Contents</td>
<td>Course contents time to time and more audio visuals aids are being improved</td>
</tr>
<tr>
<td>2</td>
<td>To train young scientists and research students with advanced techniques in Biochemistry, Molecular Biology, Genetic Engineering and Biotechnology</td>
<td>Pre requisite information and status of knowledge of researchers and students, through entry tests and student feedback</td>
<td>At the end of semester</td>
<td>Regular update curriculum</td>
<td>Revision of curriculum as per requirement. Scheme of Studies revised from time to time</td>
</tr>
<tr>
<td>3</td>
<td>To provide facilities for advanced research in Biochemistry, Molecular Biology and Biotechnology</td>
<td>Assessing interest of researcher and students</td>
<td>During routine exchange of various discussions</td>
<td>Students to make presentations and reports</td>
<td>Presentations, seminars, communication skill development</td>
</tr>
<tr>
<td>4</td>
<td>To conduct scientific meetings/conferences/workshops/seminars to facilitate exchange of ideas between scientists and transfer of technology</td>
<td>By inviting applications through proper channels</td>
<td>At the time of completion of seminars and workshops</td>
<td>By regular conducting seminars and workshops</td>
<td>Workshops and Seminars are conducted frequently</td>
</tr>
<tr>
<td>5</td>
<td>To train academician and scientists of other Universities and Institutes through seminars and workshops e.t.c</td>
<td>At the time of starting research and academic sessions</td>
<td>At the completion of research thesis</td>
<td>More need is required to trained academician and scientists</td>
<td>Academician and Scientists are trained</td>
</tr>
</tbody>
</table>
### TABLE-2  STANDARD 1-2: OBJECTIVES VS OUTCOMES

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>++</td>
<td>++</td>
<td>+++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>2</td>
<td>+++</td>
<td>++</td>
<td>++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>3</td>
<td>++</td>
<td>+++</td>
<td>++</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>4</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>5</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
</tbody>
</table>

**Key:**

++ = Relevant  
+++ = Highly Relevant

The program outcomes are fully supportive to program objectives mentioned above. Outcomes are based on actual details obtained from department documents.
Program Assessment Results:

Teachers Evaluation 2009

Overall Results of Performa 10 of Teacher 1, 2, 3, 4 and 5

The teachers were evaluated by the students at the end of the semester in accordance with Proforma-10. In the graph teachers are represented as 1, 2, 3…, instead of mentioning their names. The graph shows that most of the teachers have scored above 75% which may safely be considered as quite satisfactory. Results and performance of individual teachers will follow.
Result of Proforma 10 of Teacher 1 - (BCH-702)

The strongest point which students like about teacher 1, the Instructor is prepared for each class. 87% of the students either agreed or strongly agreed on this aspect (parameter 1). On the other hand very few people disagreed or strongly disagreed on any of the parameter.
The Instructor gives citations regarding current situations with reference to Pakistani context

- S.A: 38%
- A: 45%
- UC: 16%
- D: 0%
- S.D: 3%

The Instructor communicates the subject matter effectively

- S.A: 74%
- A: 23%
- UC: 3%
- D: 0%
- S.D: 0%

The Instructor shows respect towards students and encourages class participation.

- S.A: 7%
- A: 40%
- UC: 13%
- D: 40%
- S.D: 0%

The Instructor maintains an environment that is conducive to learning.

- S.A: 77%
- A: 23%
- UC: 0%
- D: 0%
- S.D: 0%

The Instructor arrives on time

- S.A: 40%
- A: 53%
- UC: 7%
- D: 0%
- S.D: 0%
The syllabus clearly states course objectives, requirements, procedures and grading criteria.

The course integrates theoretical course concepts with real-word applications.

The assignments and exams covered the materials presented in the course.

The course material is modern and updated.
Result of Proforma 10 of Teacher 2- (BIOL-711)
The overall compiled results of Teacher 2 show that the students were satisfied with the performance of Teacher. In almost half of the parameters, approximately 67% students have either agreed or strongly agreed which shows that Instructor returns the graded scripts etc in a reasonable amount of time. More than 57% of the students have either agreed or strongly agreed with the subject matter presented in the course has increased your knowledge of the subject.

The Instructor is prepared for each class

The Instructor demonstrates knowledge of the subject

The Instructor has completed the whole course

The Instructor provides additional material apart from text
The Instructor leaves on time

- 43% S.A
- 57% A
- 0% UC
- 0% D
- 0% S.D

The Instructor is fair in examination

- 37% S.A
- 41% A
- 15% UC
- 4% D
- 3% S.D

The Instructor returns the graded scripts, etc in a reasonable amount of time.

- 67% S.A
- 4% A
- 4% UC
- 7% D
- 18% S.D

The Instructor was available during the specified office hours and for after class consultations.

- 53% S.A
- 43% A
- 0% UC
- 0% D
- 4% S.D

The subject matter presented in the course has increased your knowledge of the subject.

- 32% S.A
- 57% A
- 0% UC
- 0% D
- 11% S.D
The syllabus clearly states course objectives, requirement procedures and grading criteria.  

- S.A: 31%  
- A: 46%  
- UC: 15%  
- D: 8%  
- S.D: 0%

The course integrates theoretical course concepts with real-word applications. 

- S.A: 32%  
- A: 47%  
- UC: 14%  
- D: 7%  
- S.D: 0%

The assignments and exams covered the materials presented in the course.  

- S.A: 25%  
- A: 61%  
- UC: 7%  
- D: 7%  
- S.D: 0%

The course material is modern and updated. 

- S.A: 43%  
- A: 32%  
- UC: 18%  
- D: 4%  
- S.D: 3%
Result of Proforma 10 of Teacher 3 – (BCH-710)
The results of proforma no. 10 for teacher 3 clearly shows that 70-77% students either strongly agreed or agreed regarding the Instructor is fair in examination.
The Instructor gives citations regarding current situations with reference to Pakistani context.

- S.A: 14%
- A: 23%
- UC: 54%
- D: 0%
- S.D: 9%

The Instructor communicates the subject matter effectively.

- S.A: 0%
- A: 39%
- UC: 52%
- D: 0%
- S.D: 9%

The Instructor shows respect towards students and encourages class participation.

- S.A: 5%
- A: 28%
- UC: 67%
- D: 0%
- S.D: 0%

The Instructor maintains an environment that is conducive to learning.

- S.A: 4%
- A: 39%
- UC: 57%
- D: 0%
- S.D: 0%

The Instructor arrives on time.

- S.A: 4%
- A: 35%
- UC: 57%
- D: 0%
- S.D: 0%
The Instructor leaves on time
- S.A: 59%
- A: 32%
- UC: 9%
- D: 0%
- S.D: 0%

The Instructor is fair in examination
- S.A: 77%
- A: 14%
- UC: 9%
- D: 0%
- S.D: 0%

The Instructor returns the graded scripts, etc in a reasonable amount of time.
- S.A: 52%
- A: 39%
- UC: 9%
- D: 0%
- S.D: 0%

The Instructor was available during the specified office hours and for after class consultations.
- S.A: 68%
- A: 27%
- UC: 0%
- D: 0%
- S.D: 5%

The subject matter presented in the course has increased your knowledge of the subject.
- S.A: 52%
- A: 44%
- UC: 4%
- D: 0%
- S.D: 0%
The syllabus clearly states course objectives, requirements, procedures, and grading criteria.

- 39% agree
- 57% strongly agree
- 4% disagree
- 0% strongly disagree

The course integrates theoretical course concepts with real-world applications.

- 9% agree
- 30% strongly agree
- 0% disagree
- 0% strongly disagree
- 61% strongly agree

The assignments and exams covered the materials presented in the course.

- 35% agree
- 0% strongly agree
- 0% disagree
- 0% strongly disagree
- 61% strongly agree

The course material is modern and updated.

- 48% agree
- 13% strongly agree
- 39% disagree
- 0% strongly disagree
Result of Proforma 10 of Teacher 4- (BCH-732)
The overall compiled results of Teacher-4 showed that his best point is parameter 13 i.e. “The Instructor was available during the specified office hours ans for after class consultations” the teacher secured 77% (strongly agreed and agreed) in the favour and 0% have strongly disagreed towards this point.
The instructor leaves on time

The instructor is fair in examination

The instructor returns the graded scripts, etc in a reasonable amount of time.

The instructor was available during the specified office hours and for after class consultations.

The subject matter presented in the course has increased your knowledge of the subject.
The syllabus clearly states course objectives requirements procedures and grading criteria.

The course integrates theoretical course concepts with real-world applications.

The assignments and exams covered the materials presented in the course.

The course material is modern and updated.
Result of Proforma 10 of Teacher 5 – (BCH-712)
Teacher performance assessment of Teacher 5 clearly indicates that 80-88% students were of view that instructor was well prepared for class, demonstrates knowledge of the subject, shows respect towards students and encourages class participation, arrives on time, leaves on time, available during the specified office hours and for after class consultations.
The Instructor gives citations regarding current situations with reference to Pakistani context

- S.A: 4%
- A: 20%
- UC: 32%
- D: 44%
- S.D: 0%

The Instructor communicates the subject matter effectively

- S.A: 4%
- A: 0%
- UC: 6%
- D: 24%
- S.D: 72%

The Instructor shows respect towards students and encourages class participation.

- S.A: 4%
- A: 12%
- UC: 0%
- D: 0%
- S.D: 84%

The Instructor maintains an environment that is conducive to learning.

- S.A: 4%
- A: 0%
- UC: 0%
- D: 40%
- S.D: 56%

The Instructor arrives on time

- S.A: 4%
- A: 0%
- UC: 16%
- D: 0%
- S.D: 80%
The teachers were evaluated by the students at the end of the semester in accordance with Proforma-10. In the graph teachers are represented as 1, 2, 3…, instead of mentioning their names. The graphs shows that most of the teachers have scored above 70% which may safely be considered as quite satisfactory. Results and performance of individual teachers will follow.
The overall compiled results of Teacher 1 show that the students were satisfied with the performance of Teacher. In almost half of the parameters, approximately 85% students have either agreed or strongly agreed which shows good acceptability of the teacher. More than 90% of the students have either agreed or strongly agreed that Instructor is prepared for each class.
The Instructor leaves on time

- S.A: 47%
- A: 14%
- UC: 12%
- D: 22%
- S.D: 5%

The Instructor is fair in examination

- S.A: 5%
- A: 2%
- UC: 70%
- D: 21%
- S.D: 2%

The Instructor returns the graded scripts, etc in a reasonable amount of time.

- S.A: 7%
- A: 4%
- UC: 0%
- D: 42%
- S.D: 47%

The Instructor was available during the specified office hours and for after class consultations.

- S.A: 2%
- A: 14%
- UC: 40%
- D: 44%
- S.D: 0%

The subject matter presented in the course has increased your knowledge of the subject.

- S.A: 28%
- A: 3%
- UC: 2%
- D: 0%
- S.D: 67%
The syllabus clearly states course objectives, requirements, procedures, and grading criteria. 65% of respondents found the syllabus clear, while 30% found it somewhat clear, 5% found it fair enough, and 0% found it not clear at all.

The course integrates theoretical course concepts with real-word applications. 57% of respondents found the course to effectively integrate theory and practice, 39% found it somewhat effective, 4% found it fair enough, and 0% found it not effective at all.

The assignments and exams covered the materials presented in the course. 59% of respondents found the assignments and exams to cover the material in the course, 34% found them somewhat effective, 7% found them fair enough, and 0% found them not effective at all.

The course material is modern and updated. 86% of respondents found the course material to be modern and updated, 14% found it somewhat modern and updated, 0% found it fair enough, and 0% found it not modern and updated at all.
Result of Proforma 10 of Teacher 2 – (BCH-703)
The results of proforma no. 10 for teacher 2 clearly shows that 50-57% studnts either strongly agreed or agreed regarding insstructor’s over all performance as a assignments and exams covered the materials presented in the, availability during the specified house and after class and leaves the class on time.
The syllabus clearly states course objectives, requirements, procedures, and grading criteria.

- S.A: 9%
- A: 26%
- UC: 19%
- D: 37%
- S.D: 9%

The course integrates theoretical course concepts with real-world applications.

- S.A: 11%
- A: 21%
- UC: 13%
- D: 38%
- S.D: 17%

The assignments and exams covered the materials presented in the course.

- S.A: 57%
- A: 3%
- UC: 8%
- D: 3%
- S.D: 29%

The course material is modern and updated.

- S.A: 23%
- A: 12%
- UC: 14%
- D: 26%
- S.D: 25%
Result of Proforma 10 of Teacher 3 (BCH-724)
The overall compiled results of Teacher-3 showed that his best point is parameter 11 i.e. “The Instructor is fair in examination” the teacher secured 60% (strongly agreed and agreed) in the favour and 10% have agreed towards this point.
The Instructor gives citations regarding current situations with reference to Pakistani context

- S.A: 64%
- A: 23%
- UC: 4%
- D: 0%
- S.D: 0%

The Instructor communicates the subject matter effectively

- S.A: 68%
- A: 32%
- UC: 0%
- D: 0%
- S.D: 0%

The Instructor shows respect towards students and encourages class participation.

- S.A: 81%
- A: 19%
- UC: 0%
- D: 0%
- S.D: 0%

The Instructor maintains an environment that is conducive to learning.

- S.A: 77%
- A: 18%
- UC: 0%
- D: 0%
- S.D: 5%

The Instructor arrives on time

- S.A: 82%
- A: 14%
- UC: 4%
- D: 0%
- S.D: 0%
Result of Proforma 10 of Teacher 4 – (BCH-102)
Teacher performance assessment of Teacher 5 clearly indicates that 90-96% students were of view that instructor was well prepared for class, demonstrates knowledge of the subject and completed the whole course.
The Instructor gives citations regarding current situations with reference to Pakistani context

- S.A: 0%
- A: 46%
- UC: 54%
- D: 0%
- S.D: 0%

The Instructor communicates the subject matter effectively

- S.A: 0%
- A: 0%
- UC: 0%
- D: 87%
- S.D: 13%

The Instructor shows respect towards students and encourages class participation.

- S.A: 4%
- A: 4%
- UC: 0%
- D: 83%
- S.D: 0%

The instructor maintains an environment that is conducive to learning.

- S.A: 0%
- A: 17%
- UC: 0%
- D: 0%
- S.D: 83%

The Instructor arrives on time

- S.A: 0%
- A: 4%
- UC: 0%
- D: 96%
- S.D: 0%
The instructor leaves on time:
- 8% S.A
- 92% A

The instructor is fair in examination:
- 17% S.A
- 83% A

The instructor returns the graded scripts, etc in a reasonable amount of time.
- 33% S.A
- 67% A

The instructor was available during the specified office hours and for after class consultations.
- 87% S.A

The subject matter presented in the course has increased your knowledge of the subject:
- 67% A
- 29% D
- 4% S.D
The syllabus clearly states course objectives, requirements, procedures, and grading criteria.

The course integrates theoretical course concepts with real-world applications.

The assignments and exams covered the materials presented in the course.

The course material is modern and updated.
Result of Proforma 10 of Teacher 5 – (BCH-707)
Teacher performance assessment of Teacher 5 clearly indicates that 70-79% students were of view that instructor was well prepared for class, complete the whole course, arrive on time and course material is modern and updated.
The syllabus clearly states course objectives, requirements, procedures, and grading criteria. 

The course integrates theoretical course concepts with real-world applications.

The assignments and exams covered the materials presented in the course.

The course material is modern and updated.
Student Course Evaluation:

**Over all Results of Proforma No. 1 Teacher 1, 2, 3, 4 and 5**

Performa No. 1, deals with study of course observation regarding design of course contents (both theoretical and practical), its relevance with subject and teaching material. It also emphasizes on instructor’s role in, not only completing course within given time frame, but how instructor developed student’s interest in this course, used updated literature and was fair in evaluation at the end of a study course. Overall results of Performa I evaluation performed for five teachers clearly show that on a scale of 3.5%, course evaluation ranged between 2.60-3.50. Teacher 1 averaged 3.20 as compared to Teacher 2 (2.90), Teacher 3 (3.00). Teacher 4 and 5 ranged between 3.30 and 3.40 respectively.

![Course Evaluation 2009](image_url)
Results of Proforma No. 1 of BCH-702 - (Teacher 1)
Depending upon the results of Performa 1, approximately 80-94% students either strongly agreed that materials in practical were useful 80% were of view that demonstrators dealt effectively with my problems. On the other hand 6% students either strongly disagreed/disagreed regarding the above mentioned criteria in Performa I evaluated for Teacher 1.
I participated actively in the course

I think I have made progress in this course

I think the course was well constructed to achieve the learning outcomes (there was a good balance of lecture, tutorials, practical etc.)

The learning and teaching methods encouraged participation.

The overall environment in the class was conducive to learning.
The course stimulated by interest and thought on the subject area.

- S.A: 47%
- A: 50%
- UC: 3%
- D: 0%
- S.D: 0%

The pace of the course was appropriate.

- S.A: 48%
- A: 45%
- UC: 7%
- D: 0%
- S.D: 0%

Ideas and concepts were presented clearly.

- S.A: 67%
- A: 30%
- UC: 0%
- D: 0%
- S.D: 3%

The method of assessment were reasonable.

- S.A: 44%
- A: 40%
- UC: 0%
- D: 3%
- S.D: 3%

Feedback on assessment was timely.

- S.A: 35%
- A: 41%
- UC: 17%
- D: 7%
- S.D: 0%
Results of Proforma No. 1 of BIOL-711 (Teacher 2)
Course assessment based on Performa 1 thought by Teacher 2 yields that 60-68% students strongly agreed/agreed regarding the course was well constructed to achieve the learning outcomes (there was as good balance of lecture, tutorials practical etc. Whereas, 0% either strongly disagreed or disagreed with the above mentioned. Approximately 63% students were of the view that the pace of the course was appropriate. Whereas, 52% agreed regarding the course workload was manageable their active participation during course.
I participated actively in the course

I think I have made progress in this course

I think the course was well constructed to achieve the learning outcomes (there was a good balance of lecture, tutorials, practical etc.)

The learning and teaching methods encouraged participation.

The overall environment in the class was conducive to learning.
Classrooms were satisfactory

Learning materials (lesson plans, course notes etc.) were relevant and useful.

Recommended reading books etc. were relevant and appropriate.

The provision of learning resources in the library was adequate and appropriate.

The provision of learning resources on the web was adequate and appropriate. (If relevant)
The course stimulated by interest and thought on the subject area.

- SA: 56%
- A: 27%
- UC: 13%
- D: 4%
- S.D: 0%

The pace of the course was appropriate

- SA: 63%
- A: 25%
- UC: 10%
- D: 2%
- S.D: 0%

Ideas and concepts were presented clearly

- SA: 60%
- A: 23%
- UC: 11%
- D: 8%
- S.D: 0%

The method of assessment were reasonable

- SA: 50%
- A: 29%
- UC: 15%
- D: 4%
- S.D: 2%

Feedback on assessment was timely

- SA: 52%
- A: 17%
- UC: 19%
- D: 6%
- S.D: 6%
Results of Proforma No. 1 of BCH-710 (Teacher 3)
The course assessment taught by Teacher 3 shows 68% strong agreement on the provision of learning resources on the web was adequate and appropriate (if relevant). However, 59% of students agreed that material was well organized and presented. 56% of students showed that demonstrators dealt effectively with problems.
Classrooms were satisfactory

- 57% A
- 33% S.A.
- 62% DUC
- 0% DD
- 0% S.D.

Learning materials (lesson plans, course notes etc.) were relevant and useful.

- 5% A
- 0% S.A.
- 33% DUC
- 62% DD
- 0% S.D.

Recommended reading books etc. were relevant and appropriate.

- 40% A
- 55% S.A.
- 48% DUC
- 9% DD
- 9% S.D.

The provision of learning resources in the library was adequate and appropriate.

- 30% A
- 48% S.A.
- 9% DUC
- 4% DD
- 9% S.D.

The provision of learning resources on the web was adequate and appropriate. (If relevant)

- 27% A
- 68% S.A.
- 5% DUC
- 0% DD
- 0% S.D.
The course stimulated by interest and thought on the subject area.

The pace of the course was appropriate

Ideas and concepts were presented clearly

The method of assessment were reasonable

Feedback on assessment was timely
The material in the tutorials was useful

I was happy with the amount of work needed for tutorials

The tutor dealt effectively with my problems

The materials in practical was useful

The demonstrators dealt effectively with my problems.
Results of Proforma No. 1 of BCH-732 (Teacher 4)
Performa I based course assessment taught by Teacher 4 produced following results; 80-84% students either strongly agreed or agreed regarding the Instructor was responsive to student needs and problems. Approximately 78% student strongly agreed that the tutor deal effectively with my problems. On the other hand, 22% students were agreed with same.
I participated actively in the course
- S.A: 39%
- A: 56%
- UC: 5%
- D: 0%
- S.D: 0%

I think I have made progress in this course
- S.A: 53%
- A: 47%
- UC: 0%
- D: 0%
- S.D: 0%

I think the course was well constructed to achieve the learning outcomes (there was a good balance of lecture, tutorials, practical etc.)
- S.A: 50%
- A: 45%
- UC: 5%
- D: 0%
- S.D: 0%

The learning and teaching methods encouraged participation.
- S.A: 53%
- A: 42%
- UC: 5%
- D: 0%
- S.D: 0%

The overall environment in the class was conducive to learning.
- S.A: 47%
- A: 42%
- UC: 11%
- D: 0%
- S.D: 0%
Results of Proforma No. 1 of BCH-712 (Teacher 5)
Taught course based assessment of Teacher 5 revealed that 80% of the students (strongly agreed or agreed) regarding that I link the course was well constructed to achieve the learning outcomes (there was a good balance to lecture, tutorial, practical where as 79% students were of view that the material in the tutorials was useful. On the other hand 0% students either strongly disagreed or disagreed with that above mentioned criteria assessed in Performa 1.
Classrooms were satisfactory
- 48% S.A
- 44% A
- 4% UC
- 0% D
- 0% S.D

Learning materials (lesson plans, course notes etc.) were relevant and useful.
- 68% S.A
- 32% A
- 0% UC
- 0% D
- 0% S.D

Recommended reading books etc. were relevant and appropriate.
- 60% S.A
- 40% A
- 0% UC
- 0% D
- 0% S.D

The provision of learning resources in the library was adequate and appropriate.
- 60% S.A
- 32% A
- 8% UC
- 0% D
- 0% S.D

The provision of learning resources on the web was adequate and appropriate. (if relevant)
- 60% S.A
- 36% A
- 4% UC
- 0% D
- 0% S.D
The material in the tutorials was useful

- 79% positive feedback
- 17% neutral feedback
- 4% negative feedback

The tutor dealt effectively with my problems

- 62% positive feedback
- 38% neutral feedback
- 0% negative feedback

The materials in practical was useful

- 52% positive feedback
- 48% neutral feedback
- 0% negative feedback

The demonstrators dealt effectively with my problems.

- 56% positive feedback
- 36% neutral feedback
- 8% negative feedback
Student Course Evaluation:

**Over all Results of Proforma No. 1 Teacher 1, 2, 3, 4 and 5**

Performa No. 1, deals with study of course observation regarding design of course contents (both theoretical and practical), its relevance with subject and teaching material. It also emphasizes on instructor’s role in, not only completing course within given time frame, but how instructor developed student’s interest in this course, used updated literature and was fair in evaluation at the end of a study course.

Overall results of Performa I evaluation performed for five teachers clearly show that on a scale of 4%, course evaluation ranged between 0-4.00. Teacher 4 averaged 3.25 as compared to Teacher 2 (2.50), Teacher 3 (3.00). Teacher 4 and 5 ranged between 3.5 and 2.70 respectively.
Results of Proforma No. 1 of BCH-704- (Teacher 1)

Depending upon the results of Performa 1, approximately 80% students strongly agreed that Teacher 1 had been regular throughout the course. 691% were of view that learning and teaching methods encouraged participation. On the other hand 2% students either strongly disagreed/disagreed regarding above mentioned criteria in Performa I evaluated for Teacher 1.
Classrooms were satisfactory

Learning materials (lesson plans, course notes etc.) were relevant and useful.

Recommended reading books etc. were relevant and appropriate.

The provision of learning resources in the library was adequate and appropriate.

The provision of learning resources on the web was adequate and appropriate. (if relevant)
The course stimulated by interest and thought on the subject area.

- S.A: 35%
- A: 61%
- UC: 0%
- D: 0%
- S.D: 4%

The pace of the course was appropriate

- S.A: 49%
- A: 4%
- UC: 5%
- D: 2%
- S.D: 5%

Ideas and concepts were presented clearly

- S.A: 32%
- A: 7%
- UC: 2%
- D: 0%
- S.D: 59%

The method of assessment were reasonable

- S.A: 50%
- A: 9%
- UC: 2%
- D: 2%
- S.D: 37%

Feedback on assessment was timely

- S.A: 45%
- A: 4%
- UC: 35%
- D: 11%
- S.D: 5%
Results of Proforma No. 1 of BCH-703- (Teacher 2)
Course assessment based on Performa 1 thought by Teacher 2 yields that 62% students strongly agreed/agreed regarding that Instructor participated actively in the course whereas, 0% either strongly disagreed or disagreed with the above mentioned. Approximately 60% students were of the view that learning materials (lessons plans, course notes etc) were relevant and useful.
The course stimulated by interest and thought on the subject area.

The pace of the course was appropriate.

Ideas and concepts were presented clearly.

The method of assessment were reasonable.

Feedback on assessment was timely.
Results of Proforma No. 1 of BCH-724 (Teacher 3)
The course assessment taught by Teacher 3 shows 73% strongly agreed/agreed regarding the instructor has been regular throughout the course. However, 68% students strongly agreed with that the course was well organized (e.g., timely access to materials, notification of changes). As far as student learning, teaching methods, and students assessment during examination goes 64% either strongly agreed or agreed.

The course objectives were clear

- 64% agreed/agreed
- 36% agreed
- 0% disagreed
- 0% strongly disagreed

The course workload was manageable

- 36% agreed/agreed
- 55% agreed
- 9% disagreed
- 0% strongly disagreed

The course was well organized (e.g., timely access to materials, notification of changes, etc.)

- 68% agreed/agreed
- 23% agreed
- 9% disagreed
- 0% strongly disagreed

Approximate level of your own attendance during the whole course.

- 81% agreed/agreed
- 19% agreed
- 0% disagreed
- 0% strongly disagreed
I participated actively in the course

I think I have made progress in this course

I think the course was well constructed to achieve the learning outcomes (there was a good balance of lecture, tutorials, practical etc.)

The learning and teaching methods encouraged participation.

The overall environment in the class was conducive to learning.
Classrooms were satisfactory

Learning materials (lesson plans, course notes etc.) were relevant and useful.

Recommended reading books etc. were relevant and appropriate.

The provision of learning resources in the library was adequate and appropriate.

The provision of learning resources on the web was adequate and appropriate. (if relevant)
Results of Proforma No. 1 of BCH-102 (Teacher 4)

Performa I based course assessment taught by Teacher 4 produced following results; 83% students either strongly agreed or agreed regarding learning material were relevant and useful. Approximately 76% students agreed that the course was well organized access to materials, notification of charges etc. On the other hand, 67% students were of view that overall environment in the class was conducive to learning. Overall 33% students agreed with the above mentioned criteria in Performa 1.
Classrooms were satisfactory

Learning materials (lesson plans, course notes etc.) were relevant and useful.

Recommended reading books etc. were relevant and appropriate.

The provision of learning resources in the library was adequate and appropriate.

The provision of learning resources on the web was adequate and appropriate.
The course stimulated by interest and thought on the subject area.

- 50% S.A
- 50% A

The pace of the course was appropriate

- 54% S.A
- 46% A

Ideas and concepts were presented clearly

- 71% S.A
- 29% A

The method of assessment were reasonable

- 67% S.A
- 33% A

Feedback on assessment was timely

- 50% S.A
- 50% A
The material in the tutorials was useful

- 48% S.A
- 43% A
- 9% UC
- 0% D
- 0% SD

I was happy with the amount of work needed for tutorials

- 62% S.A
- 29% A
- 9% UC
- 0% D
- 0% SD

The tutor dealt effectively with my problems

- 54% S.A
- 38% A
- 8% UC
- 0% D
- 0% SD

The materials in practical was useful

- 71% S.A
- 25% A
- 0% UC
- 0% D
- 4% SD

The demonstrators dealt effectively with my problems

- 67% S.A
- 29% A
- 4% UC
- 0% D
- 0% SD
Results of Proforma No. 1 of BCH-707 (Teacher 5)

Taught course based assessment of Teacher 5 revealed that 60% of the students (strongly agreed or agreed) regarding they have made progress in this course. Where 53% students were of view that learning materials were relevant and useful. On the other hand 0% students either strongly disagreed or disagreed with the above mentioned criteria assessed in Performa 1.
Feedback on assessment was helpful

I understood the lectures

The material was well organized and presented

The instructor was responsive to student needs and problems

Had the instructor been regular throughout the course?
Results of Proforma No. 2: Results of Faculty Course Review Report

According to the result of the proforma No. 2, most of the teachers pointed out that it will be an ideal to have modern lecture theaters equipped with internet and multimedia facility.

Results of Proforma No. 4: Research Student Progress Form/Result of Faculty Survey

According to the result of the proforma No. 4, the students of M.Phil. and Ph.D. pointed out the problems regarding to the administrative and financial approval of the budget/ and as well as maintenance. Most of the students of M.Phil. and Ph.D. are interested to take training from abroad and they also have keen interest to operate sophisticated equipments. They also pointed out the problems regarding to the availability of computers and they don’t have too much computer to download literature related to their research work.

Proforma No. 5: Results of Faculty Survey

According to Annexure II regarding the satisfaction of the Faculty, the weakest aspect is the amount of time teachers find to interact with their families. This is basically due to the shortage of teachers.

![Graph 1: Your mix of research, teaching and community service](image1)

![Graph 2: The intellectual stimulation of your work](image2)

![Graph 3: Type of teaching/research you currently do.](image3)
ANNEXURE III: RESULTS OF GRADUATING STUDENTS SURVEY

According to the results of Graduating Students Survey approximately 45% student were of view that “The program is effective in enhancing team working abilities”, “the Program administration is effective in supporting learning”, “The program is effective in developing analytical and problems solving skills”, “The program is effective in developing written communication skills”, “The program is effective in developing planning abilities”, “The objective of program fully achieved”, “The environment was conducive for learning” and “Whether scholarships were available student in case of hardship”. Where a as 35% were uncertain regarding to above mention criteria.

![Bar chart for The work in the program is too heavy and induces a lot of pressure](chart1.png)

![Bar chart for The program is effective in enhancing team working abilities](chart2.png)

![Bar chart for The program administration is effective in supporting learning](chart3.png)
The program is effective in developing analytical and problem solving skills

The program is effective in developing independent thinking

The program is effective in developing written communication skills
The program is effective in developing planning abilities.

The objectives of the program have fully achieved.

Whether the contents of curriculum are advanced and meet program objectives.
Faculty was able to meet the program objectives

The environment was conducive for learning

Whether the infrastructure of the department was good
Whether scholarships were available to students in case of hardship

Whether the program comprised of co-curricular and extra-curricular activities

Skills and Capabilities Reflected in Performance as Biochemistry:

Students develop ability to apply knowledge of Biochemistry and to work as professionals, to build confidence and communicate effectively in writing, oral and demonstration to use modern tools, techniques and skills for their profession, to formulate and design the experiments/project sand to work effectively in a team, to manage different problems and imbibe ability to recognize future needs.

Standard 1-3

Strength of the Department:
The department of Biochemistry have fully equipped laboratory with latest instruments. The main strength of the department is the availability of highly qualified and skilled teachers, with full acquaintance of their respective subjects, having vast knowledge of Biochemistry, Molecular Biology and Biotechnology. Majority of the faculty members have foreign degrees/post-doctoral expericence and are experts in their fields and knowledge of latest and modern molecular approaches. They have implemented National/International research projects and are highly conscious of the problems to be taken by the post-graduate students.
Weakness Identified in the Program:
There is shortage of faculty members in department and due to their heavy workload in teaching, activities are not at their full pace. Advanced teaching and research is being handicapped due to deficiency of lecture rooms and post-graduate laboratories. Access to literature has been erratic due to regular problem in internet. Though building of department is not sufficient and Unversity Institute of Biochemistry and Biotechnology (UIBB) in future will fulfill the purpose.

Major Future Improvement Plans:
- Developing of human resource for the highly advanced fields of biochemistry, biotechnology and bioinformatics to play a crucial role in national development.
- Strengthening graduate, post graduate and postdoctoral programmes in Biochemistry, Biotechnology and Bioinformatics.
- Up-gradation of research by integrating biochemistry, biotechnology and bioinformatics into existing traditional systems.
- To emphasize biochemical and molecular approaches in vitro techniques in plant propagation, crop improvement and plant disease management as well as animal disease management.
- Strengthening our capabilities in cloning animal, plant, viral and bacterial genes to be utilized in various ways.
- Introduction of genetic engineering of crops as a regular feature for crop improvement.
- Production of recombinant proteins, enzymes, hormones, antibiotics or vaccines etc for therapeutic use/diagnostic purposes for human, plants ,animals and industries.
- Development of efficient microbes for treatment of waste and other hazardous materials and to take care of environmental pollution.

<table>
<thead>
<tr>
<th>Sr. #</th>
<th>Particular</th>
<th>No.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>M.Sc produced</td>
<td>190</td>
<td>M.Sc. Graduates from the Department are working in public as well as private sector in research, teaching, diagnostics, pharmaceuticulas, chemical and equipment supplies. Many ex-students have joined M.Phil. and Ph.D. programs in PMAS-AUR, QAU, PU &amp; UAF</td>
</tr>
<tr>
<td>ii</td>
<td>M.Phil</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>Ph.D.</td>
<td>14</td>
<td>In employment</td>
</tr>
<tr>
<td>iv</td>
<td>Post-Doc fellowship by faculty</td>
<td>4</td>
<td>USA, UK and Canada</td>
</tr>
<tr>
<td>v</td>
<td>Students: Faculty ratio</td>
<td>29:1</td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>Technical : No Technical ratio</td>
<td>43:1</td>
<td></td>
</tr>
</tbody>
</table>

TABLE-3: QUANTITATIVE ASSESSMENT OF THE DEPARTMENT (Last three years)

Faculty

Table-3.1: Faculty Distribution in Biochemistry

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Qualification</th>
<th>Specialization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. S.M.Naqvi</td>
<td>Professor</td>
<td>Ph. D.</td>
<td>Molecular Biology/ Biotechnology</td>
</tr>
<tr>
<td>Dr. M.Gulfraz</td>
<td>Professor</td>
<td>Ph. D.</td>
<td>Biochemistry/Natural Product Chemistry</td>
</tr>
<tr>
<td>Dr. Ghazala Kakub Raja</td>
<td>Associate Professor</td>
<td>Ph. D.</td>
<td>Biochemistry/ Molecular Biology</td>
</tr>
<tr>
<td>Dr.M.Javaid Asad</td>
<td>Assistant Professor</td>
<td>Ph. D.</td>
<td>Industrial/Fermentation Biotechnology</td>
</tr>
<tr>
<td>Dr. M.Sheeraz Ahmad</td>
<td>Assistant Professor</td>
<td>Ph. D.</td>
<td>Biochemistry/Plant Biotechnology</td>
</tr>
<tr>
<td>Ms. Pakeeza Arzoo</td>
<td>Lecturer</td>
<td>Ph.D. in progress</td>
<td>Human molecular genetics</td>
</tr>
<tr>
<td>Dr.Feroza Watoo</td>
<td>Assistant Professor</td>
<td>Ph. D.</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Dr. Azra Khanum</td>
<td>Professor</td>
<td>Ph. D.</td>
<td>Biochemistry/Biotechnology</td>
</tr>
</tbody>
</table>
The department is well established and its distinguishing feature is the availability of all expertise (Molecular Biology, Plant Biotechnology, Environment Biotechnology and Enzymology).

The Department is providing following community Services:

To enhance the quality and quantity of scientific trainings, the Department has organized the workshops and seminars. The basic aim is also to provide a forum for knowledge/information exchange between academic disciplines and raising general awareness about Biochemistry and Biotechnology.

CRITERION 2: CURRICULUM DESIGN AND ORGANIZATION

Degree Title: M.Sc. (Biochemistry)

Intent:
Curriculum design and update is initiated by the faculty members of the Department after the approval of Board of Studies which is comprised of senior faculty members and subject specialist who is taken from other faculties or from other Universities or research Institutions. It is headed by the Chairman of the Department. The approved curriculum is then sent to Board of Faculty, headed by the Dean Faculty of Sciences. This Board consist senior faculty members from all the Departments of the faculty and subject specialists. Finally the curriculum is presented before the Academic Council which is comprised of the Professor, Associate Professor, Faculty Representatives and very senior subject specialists.

Definition of Credit Hour:
A student must complete a definite number of credit hours. One credit hour is one theory lecture or two hours laboratory (practical / week). One credit hour carries 20 marks. A semester is of 18 weeks.
Presently following degrees are offered by the Department:

<table>
<thead>
<tr>
<th>Degrees</th>
<th>Min. Course Hrs</th>
<th>Thesis</th>
<th>Duration (in Semesters)</th>
<th>Passing CGPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.Sc. (without thesis)</td>
<td>55</td>
<td>-</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.50</td>
<td></td>
</tr>
<tr>
<td>M.Sc (with thesis)</td>
<td>45</td>
<td>10</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.50</td>
<td></td>
</tr>
<tr>
<td>M.Phil.</td>
<td>30</td>
<td>10</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.50</td>
<td></td>
</tr>
<tr>
<td>Ph.D.</td>
<td>18</td>
<td>50</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.00</td>
<td></td>
</tr>
</tbody>
</table>

**Pre-requisites**

**Minimum Academic Requirements:**
A person holding B.Sc. in science or equivalent degree from any recognized institute with at least second division or overall 45 % marks is eligible to get admission.

The admission to the University is on merit which is determined by the percentage of last degree.

**Degree Requirements:**
Degrees are awarded after completing the required number of credit hours (courses). Minimum Grade Point Average for obtaining the degree is 2.50. To remain on the roll of the university, a student shall be required to maintain the following minimum GPA/CGPA in each semester:

<table>
<thead>
<tr>
<th>Semester</th>
<th>CGPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>1.50</td>
</tr>
<tr>
<td>Second</td>
<td>1.75</td>
</tr>
<tr>
<td>Third</td>
<td>2.00</td>
</tr>
<tr>
<td>Fourth</td>
<td>2.50</td>
</tr>
</tbody>
</table>

**Examination & Weight-age:**

a) **Theory**
In course work, student's evaluation is done by mid-term examination, assignments/quizzes and final examination. A student, who misses the mid-term examination, is not allowed a make-up examination and is awarded zero marks in that examination. In case a student does not appear in the final examination of a course, he shall be deemed to have failed in that course. In theory, weightage to each component of examination is as prescribed here under:

- Mid Examination 30%
- Assignments 10%
- Final Examination 60%

b) **Practical**
For practical examination (if applicable) 100% weightage is given to practical as scored final examination

**Eligibility for Examination:**
A student is eligible to sit for the examination provided that he/she has attended not less than 75% of the classes in theory and practical, separately.

The minimum pass marks for each course are 40 % for M.Sc. and M.Phil. while 50% for Ph.D.
TABLE-5: SCHEME OF STUDIES FOR M.SC. IN BIOCHEMISTRY

First semester

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCH-701</td>
<td>Biochemistry</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BIOL-701</td>
<td>Cellular Biology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BIOL-709</td>
<td>Fundamentals of Microbiology and Immunology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>STAT-700</td>
<td>Elements of Statistics and Biometry</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>ZOOL-703</td>
<td>Principle of Genetics</td>
<td>3(2-2)</td>
</tr>
</tbody>
</table>

Second semester

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCH-703</td>
<td>Metabolism</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-704</td>
<td>Molecular Biology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-705</td>
<td>Enzymology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-707</td>
<td>Cellular Signaling Mechanisms</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>BIOL-703</td>
<td>Plant Physiology</td>
<td>3(2-2)</td>
</tr>
</tbody>
</table>

Third semester

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCH-702</td>
<td>Bioinformatics</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-709</td>
<td>Biological Methods and Instrumentation</td>
<td>2(0-4)</td>
</tr>
<tr>
<td>BCH-710</td>
<td>Protein Chemistry</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>BCH-712</td>
<td>Genetic Engineering</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-720</td>
<td>Seminar I</td>
<td>1(1-0)</td>
</tr>
<tr>
<td>BIOL-711</td>
<td>Research Planning and Report Writing</td>
<td>3(1-4)</td>
</tr>
</tbody>
</table>

Fourth semester

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCH-706</td>
<td>Tissue and Cell Culture</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-708</td>
<td>Human Physiology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-711</td>
<td>Biomembranes</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>BCH-713</td>
<td>Biotechnology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BIOL-729</td>
<td>General Pharmacology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-714</td>
<td>Clinical Biochemistry</td>
<td>3(0-6)</td>
</tr>
<tr>
<td>BCH-716</td>
<td>Nutrition and Dietetics</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-721</td>
<td>Environmental Biochemistry</td>
<td>3(2-2)</td>
</tr>
</tbody>
</table>

TABLE-6: POST GRADUATE COURSES (M.Phil/Ph.D)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCH-701</td>
<td>Biochemistry</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-702</td>
<td>Bioinformatics</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-703</td>
<td>Metabolism</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-704</td>
<td>Molecular Biology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-705</td>
<td>Enzymology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-706</td>
<td>Tissue and Cell Culture</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-707</td>
<td>Cellular Signaling Mechanism</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>BCH-708</td>
<td>Human Physiology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>BCH-709</td>
<td>Biological Methods and Instrumentation</td>
<td>2(0-4)</td>
</tr>
<tr>
<td>Course/Group of Courses</td>
<td>Outcomes</td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>x</th>
<th>Satisfactory</th>
</tr>
</thead>
<tbody>
<tr>
<td>x x</td>
<td>Relevant &amp; satisfactory</td>
</tr>
<tr>
<td>x x x</td>
<td>Very relevant &amp; satisfactory</td>
</tr>
<tr>
<td>x x x x</td>
<td>Highly relevant &amp; highly satisfactory</td>
</tr>
</tbody>
</table>

- The curriculum fulfills and satisfies the core requirements for the program, as specified by the respective accreditation body and HEC.

**Standard 2.1: Assessment of the Biochemistry Curriculum**

The assessment of curriculum is given in the following table and courses are cross-tabulated according to the program outcomes.

**TABLE-7: CURRICULUM VS PROGRAMM OUTCOME**

<table>
<thead>
<tr>
<th>Course/Group of Courses</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

- The curriculum fulfills and satisfies the core requirements for the program, as specified by the respective accreditation body and HEC.

**Standard 2-2: Theoretical backgrounds, problem analysis, solution design given as**
### Meeting Standard 2-2: Percentage of Elements in Courses

<table>
<thead>
<tr>
<th>Elements</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only Practical</td>
<td>BCH – 709, BCH – 714</td>
</tr>
</tbody>
</table>

#### Standard 2-3: The curriculum satisfied the core requirements for the programmes as specified by HEC

#### Standard 2-4: The curriculum satisfied the core requirements for the programmes as specified by HEC

#### Standard 2-5: The curriculum satisfied the core requirements for the programmes as specified by HEC

#### Standard 2-6: Information technology components of the curriculum have been applied by offering a different course like Experimental Design and Computer Applications

#### Standard 2-7: Enhancing Oral and Written Communication Skills of the students
- One seminar in M.Sc. and two seminars carrying one credit hour each at M.Phil. and Ph.D. level are compulsory.
- Students are assigned to present generally the recent status/status on various global and local issues/problems.
- Assignments are given to M.Sc, M.Phil & Ph.D. students on specific titles (part of the course) which are submitted as written report, to increase their writing skills.

#### Criterion 3: Laboratories and Computer Facilities
There are four laboratories in the department. The facilities and shortcomings of these laboratories are listed as under.

1. Biotechnology and Molecular Biology Lab I
2. Biochemistry and Molecular Biology Lab II
3. Biotechnology Lab
4. General Biochemistry Lab
5. Biochemistry Lab 4

- **Location:** Faculty of Sciences 1st Floor, Main Campus Academic Block
- **Objectives:** Laboratories are used for: Practical exercise and demonstrations to the students in their introductory and major courses. Research work for the graduate and post-graduate students. For implementing the projects funded by the University, HEC, PSF, PARC and other agencies.
• **Shortcoming:** Laboratories are reasonably equipped but not spacious and adequate. However, these problems will be circumvented in the near future when the Department will be shifted to a new building.

• **Safety Regulations:** Fire extinguishers and first aid kits are available. However, the University maintains a Medical Dispensary for such incidents.

**Standard 3-1: Laboratory Manuals:**
Laboratory manuals for each subject are available. The departmental library **has** all the relevant books. However, **teachers also** have their own books to prepare the lectures.

**Standard 3-2: Support/Laboratory Personal for Maintenance of Laboratory**
One Lab Assistant is available to maintain laboratory equipment, glassware, chemicals, materials, etc. Three laboratory attendants assist the students in practicals, cleaning, and washing. The laboratory attendants may not have the relevant knowledge.

**Standard 3-3:**

**Computing Infrastructure and Facilities**

• **Computing facilities support:** Not available to all faculty members and the postgraduate students.

• **Shortcoming in computing infrastructure:** Computers with internet facilities should be available to all faculty members and postgraduate students.

• **Safety Arrangements:** There are proper safety arrangements and security plans available in case of emergency. The department is located on the 1st floor; there are no emergency exits for the labs.
Criterion 4: Student Support and Advising

Our University organizes support programs for students and provide information regarding admission, scholarship schemes etc. Department in its own capacity arranges orientation and guided tours of the department. Director Students Affairs is also arranges various cultural activities and solves the students’ problems. However currently there is no Parent/Teacher or student association/student union.

Standard 4-1: Frequency of Courses

- Courses are taught as per policy at the University/Academic Council.
- Elective courses are offered as per policy of HEC and the University.
- For post graduate programs, a variety of courses is offered according to demand of the profession.

Standard 4-2: Structure of the Courses

To ensure effective interaction between students, faculty and teaching assistants, at the time of course formulation both theoretical and practical aspects are focused. Theoretical problems are explained and assignments are also given to the students whereas practical are carried out in the labs. Study tours to various research organizations are also organized to keep them update on the latest developments in the area and to stimulate them for discussion through teacher/ student interaction.

Standard 4.3: Guidance to the students

Several steps have been taken to provide students guidance such as:

- Students are informed about the program requirement through the office of the head of the department.
- Through the personal communication of the teachers with the students.
- In case of some problem Director Student Affairs appointed by the university, helps the students. Students can interact with the teachers/scientist in universities or research organization whenever they needed and there is an open option for the students to get the membership in the professional societies.
- Realizing the need for exploring job opportunities for the university graduates, Directorate of Placement Bureau has been established.

Criterion 5: Process Control

It includes students admission, students registration and faculty recruitment activities which are dealt by various statutory bodies and the university administration.

Standard 5.1: Program Admission Criteria

- The process of admission is well established and followed as per rules and criteria set by HEC and the University. For this purpose an advertisement is published in the National News Papers by the Registrar Office.
- Admission criteria for M.Sc in Biochemistry is B.Sc.(with Chemistry) or equivalent.
- Admission criteria for M.Phil and Ph.D. are same as mentioned in section 2.
- Admission criteria are revised whenever needed.

Standard 5.2: Process of Registration

- The student name, after completion of the admission process, is forwarded to the Registrar Office for proper registration in the specific program and the registration number is issued to the student.
- Students are evaluated through Mid, Final and Practical exams and through Assignments.
Registration is done for one time for each degree but evaluation is done through the result of each semester. Only those students who fulfill the criteria of the University, they are promoted to the next semester.

In general, the students are registered on competition bases keeping in view the academic and research standards.

**Standard 5.3: Recruiting Process for Faculty**

Recruitment policy followed by the University is recommended by HEC. Induction of all posts is done as per rule:

- Vacant and newly created positions are advertised in the national newspapers, applications are received by the Registrar office, call letters are issued to the short-listed candidates on the basis of experience, qualification, publications and other qualities/activities as determined by the University.
- The candidates are interviewed by the University Selection Board and Vice Chancellor and alternate candidates are selected.
- Selection of candidates is approved by the Syndicate for issuing orders to join within a specified period.
- Induction of new candidates depends upon the number of approved vacancies.
- Standards set by HEC are followed.
- **Tenure Track System (TTS) recommended by HEC has been adopted by the University.**
- HEC also supports appointment of highly qualified members as foreign faculty Professors, National Professors and deputes them in concerned departments of the University.

**Standard 5.4: Teaching and Delivery of Course Material**

- To provide high quality teaching, department periodically revises the curriculum depending upon requirements, innovations and new technology.
- With the emergence of new fields, new courses are introduced, and included in the curriculum.
- Students usually buy cheap Asian editions of technology books. These are also available in the University library, where modest documentation, copying and internet facilities are available.
- Almost all the lectures are supplemented by multimedia, overheads, slides and animations.
- All efforts are made that the courses and knowledge imparted meet the objectives and outcome. The progress is regularly reviewed in the staff meetings.

**Standard 5.5: Completion of Program Requirements**

- The controller of examinations announces the dates of commencement of examination. After each semester, the controller office notifies the results of the students. The evaluation procedure consists of quizzes, mid and final examinations, practicals, assignments/reports, oral and technical presentations. The minimum pass marks for each course is 40% for undergraduate and Master degree and 50% for Ph.D. in theory and practical separately.
- In theory, weightage to each component of examination is as prescribed here under:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid Examination</td>
<td>30%</td>
</tr>
<tr>
<td>Assignments</td>
<td>10%</td>
</tr>
<tr>
<td>Final Examination</td>
<td>60%</td>
</tr>
</tbody>
</table>

- Grade points are as follows
<table>
<thead>
<tr>
<th>Marks obtained</th>
<th>Grade</th>
<th>Grade point</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>80-100 %</td>
<td>A</td>
<td>4</td>
<td>Excellent</td>
</tr>
<tr>
<td>65-79 %</td>
<td>B</td>
<td>3</td>
<td>Good</td>
</tr>
<tr>
<td>50-64 %</td>
<td>C</td>
<td>2</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>40-49 %</td>
<td>D</td>
<td>1</td>
<td>Pass</td>
</tr>
<tr>
<td>Below 40 %</td>
<td>F</td>
<td>0</td>
<td>Fail</td>
</tr>
</tbody>
</table>

- Gold medals are awarded to the M.Sc. students who secure highest marks. Degrees are awarded to the students on the annual convocation that is held every year.
## SURVEY OF DEPARTMENT OFFERING Ph.D. PROGRAMS

Information regarding Ph.D. program offered by the Department of Biochemistry

### 1 General Information:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Name of Department</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>1.2</td>
<td>Name of Faculty</td>
<td>Sciences</td>
</tr>
<tr>
<td>1.3</td>
<td>Date of initiation of Ph.D. program</td>
<td>2001</td>
</tr>
<tr>
<td>1.4</td>
<td>Total number of academic journals subscribed in area relevant to Ph.D. program.</td>
<td>HEC Digital Library Journals</td>
</tr>
<tr>
<td>1.5</td>
<td>Number of Computers available per Ph.D. student</td>
<td>Total 9</td>
</tr>
<tr>
<td>1.6</td>
<td>Total Internet Bandwidth available to all the students in the Department.</td>
<td>2 MB for whole Campus</td>
</tr>
</tbody>
</table>

### 2 Faculty Resources:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Number of faculty members holding Ph.D. degree in the department.</td>
<td>7 out of 7</td>
</tr>
<tr>
<td>2.2</td>
<td>Number of HEC approved Ph.D. Advisors in the department.</td>
<td>7</td>
</tr>
</tbody>
</table>

### 3 Research Output:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 3.1 | Total number of articles published last year in International Academic Journals that are authored by faculty members and students in the department. | In 2006 = 12  
In 2007 = 06  
In 2008= 25  
In 2009= 13  
In 2010 = 12 |
| 3.2 | Total number of articles published last year in Asian Academic Journals that are authored by faculty members and students in the department. | In 2006 = 05  
In 2007 = 13  
In 2008= 00  
In 2009= 00  
In 2010= 02 |
<p>| 3.3 | Total number of ongoing research projects in the department funded by different organizations | 07 |
| 3.4 | Number of post-graduate students in the department holding scholarships/fellowships. | 12 |
| 3.5 | Total Research Funds available to the Department from all sources. (Research Project + University Funding) | Rs. 8,588,052/- |
| 3.6 | Number of active international linkages involving exchange of researchers/students/faculty etc. (Attach Details). | 1 |</p>
<table>
<thead>
<tr>
<th></th>
<th>Student Information:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Number of Ph.D. degrees conferred to date to students from the Department during the past three academic years.</td>
<td>17</td>
</tr>
<tr>
<td>4.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Number of Ph.D. students currently enrolled in the department.</td>
<td>25</td>
</tr>
<tr>
<td>4.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ratio of number of students accepted to total number of applicants for Ph.D. Program.</td>
<td>60%</td>
</tr>
<tr>
<td>4.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Program Information</td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>Entrance requirements into Ph.D. Program (M.Sc. / M.Phil.) Indicate subjects or M.Sc. / M.Phil.</td>
<td>M.Phil.</td>
</tr>
</tbody>
</table>
| 5.2 | Is your Ph.D. program based on research only? (Y/N)                                                          | No. 
| 5.3 | Maximum number of years in which a Ph.D. degree has to be completed after initial date of enrollment in Ph.D. program. | 5 years 10 semester |
| 5.4 | Total number of post M.Sc. (16 year equivalent) courses required for Ph.D.                                    | 30+18=48 credit |
| 5.5 | Total number of M.Phil. level courses taught on average in a Term / Semester.                                 | 4 |
| 5.6 | Total number of Ph.D. level courses taught on average in a Term / Semester.                                   | 2 |
| 5.7 | Do your students have to take/write:                                                                        |   |
| 5.7.1 | a. Ph.D. Qualifying examination (Y/N)                                                                          | Y |
| 5.7.2 | b. Comprehensive examination (Y/N)                                                                             | Y |
| 5.7.3 | c. Research paper in HEC approved Journal                                                                     | Y |
| 5.7.4 | d. Any other examination (Y/N) International GRE                                                                 | International GRE |
| 5.8 | Total number of International examiners to which the Ph.D. dissertation is sent.                               | 54 |
| 5.9 | How is the selection of an examiner from technologically advanced countries carried out?                      | Based on Position Experience Relevance |
| 5.10 | Is there a minimum residency requirement (on campus) for award of Ph.D. degree?                               | Six Semesters |
| 6 | Additional Information                                                                                         |   |
| 6.1 | Any other information that you would like to provide.                                                         | TTS |
Faculty Resume
# Faculty Resume

<table>
<thead>
<tr>
<th>Name</th>
<th>Prof. Dr. S. M. Saqlan Naqvi</th>
</tr>
</thead>
</table>

## Personal
Chairman  
Department of Biochemistry  
Pir Mehr Ali Shah  
Arid Agriculture University Rawalpindi  
46300-Pakistan.  
Ph. No. 92(51)962246, 4845623, 92(51)9290151~2, Ext. 146

## Experience
List current appointment first, each entry as follows:  
**Date, Title, Institution.**  
**Attached Annex-I**

## Honor and Awards
List honors or awards for scholarship or professional activity.  
**Attached Annex-II**

## Memberships
List memberships in professional and learned Societies, indicating offices held, committees, or other specific assignments.  
**Attached Annex-III**

## Graduate Students
**Postdocs**  
**Undergraduate Students**  
**Honour Students**
List supervision of graduate students, postdocs and undergraduate honors theses showing:  
**Years**  
**Degree**  
**Name**
Show other information as appropriate and list membership on graduate degree committees.  
**Attached Annex - VI**

## Service Activity
List University and public service activities.  
**Attached Annex - V**

## Brief Statement of Research Interest
- Tissue culture for genetic transformation  
- Cloning of genes, cDNAs and regulatory elements and their application in agriculture/food industry.  
- Construction of transgenic plants for for improved agricultural productivity.  
- Bioinformatics & Nanobiotechnology; applications, teaching and tools development

## Publications
List publications in standard bibliographic format with earliest date first.  
- Manuscripts accepted for publication should be included under appropriate category as “in press;”  
- Segment the list under the following standard headings:  
  - Articles published by refereed journals.  
    (Annex – VI)  
  - Books. (Annex – VII)  
  - Scholarly and / or creative activity published through a refereed electronic venue.  
  - Contribution to edited volumes.
<table>
<thead>
<tr>
<th>Research Grants and Contracts.</th>
<th>Entries should include:</th>
<th>Total Award Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Date</td>
<td>Title</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Research or Creative Accomplishments</td>
<td>List patents, software, new products developed, etc.</td>
<td></td>
</tr>
<tr>
<td>Selected Professional Presentations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Higher Education

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2010- to date</td>
<td>Professor TTS</td>
<td>Department of Biochemistry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>University of Arid Agriculture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rawalpindi, 46300-Pakistan</td>
</tr>
<tr>
<td>Aug 2006-May 2010</td>
<td>Professor</td>
<td>Department of Biochemistry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>University of Arid Agriculture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rawalpindi, 46300-Pakistan</td>
</tr>
<tr>
<td>Dec 1999-Aug 2006</td>
<td>Associate Professor</td>
<td>Department of Biochemistry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>University of Arid Agriculture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rawalpindi, 46300-Pakistan</td>
</tr>
</tbody>
</table>

### Research

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 1995~Nov 1999</td>
<td>Senior Scientific Officer</td>
<td>Agricultural Biotechnology Institute</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pakistan Agricultural Research Council</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Islamabad, Pakistan</td>
</tr>
<tr>
<td>Jan 1986~April 1995</td>
<td>Scientific Officer</td>
<td>Agricultural Biotechnology Institute</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pakistan Agricultural Research Council</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Islamabad, Pakistan</td>
</tr>
<tr>
<td>July 1985~Jan 1986</td>
<td>Assistant Director</td>
<td>National Research Institute for Reproductive Physiology</td>
</tr>
<tr>
<td></td>
<td></td>
<td>National Institute of Health</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Islamabad, Pakistan</td>
</tr>
<tr>
<td>June 1985~July 1985</td>
<td>Abstractor/Indexer</td>
<td>Pakistan Scientific &amp; Technological Information Center</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pakistan Science Foundation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Islamabad, Pakistan</td>
</tr>
</tbody>
</table>

### Industry

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar 1979~May 1985</td>
<td>Assistant Manager II</td>
<td>(Quality Control/Production)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ghee Corporation of Pakistan.</td>
</tr>
</tbody>
</table>
Honor and Awards

- Focal Personal for Plant Biotechnology, Research and Development HEC, Islamabad.
- Member Technical Review Board of the Internation Research Support Initiative Program of HEC
- Member Technical Committee of the NSLP of Pakistan Science Foundation
- Selection of the theme of title page of the highly reputed journal the “Plant Physiology Volume 39(3), November 2005” from my research paper. (see publication list).
- Research Productivity Award (2001-2) from Ministry of Science & Technology, Government of Pakistan
- Accredited Ph.D. Supervisor declared by Higher Education Commission of Pakistan
- Merit Scholarship for Ph.D. from Turkish Government.
- First position in M.Phil. from Quaid-i-Azam University, Islamabad.
- Second position in M.Sc. Biology from Quaid-i-Azam University, Islamabad.
- Merit Scholarship during M.Sc.
- Fauji Foundation Scholarship during B.Sc.
- Merit Scholarship during Higher Secondary Schooling.
- Merit Scholarship during Secondary Schooling.
Memberships

MEMBER PROFESSIONAL SOCIETIES

▲ Life Member & Vice President  Botanical Society of Pakistan
▲ Member  International Society for Computational Biology
▲ Member  Pakistan Phytopathological Society
▲ Life Member  Pakistan Society for Biochemistry & Molecular Biology
# RESEARCH SUPERVISION

<table>
<thead>
<tr>
<th>Year</th>
<th>Degree</th>
<th>Name</th>
</tr>
</thead>
</table>
| B.Sc. Computer Science  
(Completed) |  
Development of Software for DNA restriction analysis, translation and ORF search |  |
| M.Sc Thesis  
(Completed) |  |  |
| 2006 | M.Sc. Biochemistry | Saima Riaz |
| 2004 | M.Sc. Biochemistry | Pakeeza A. Malik |
| 2003 | M.Sc. Biochemistry | Tasawar Sultana |
| 2003 | M.Sc. Biochemistry | Uzma Rani |
| 2003 | M.Sc. Biochemistry | S. Tanzeel-ur-Rehman |
| 2001 | M.Sc. Biochemistry | S. Qasim Raza |
| 2001 | M.Sc. Biochemistry | M. Zeeshan Raza |
| 2001 | M.Sc. Biochemistry | S. Tanzeel-ur-Rehman |

**Member Supervisory Committees**  
M.Sc. ~15  
(Degrees in Biochemistry, Botany, Biology & Zoology)

| M.Phil., M.Sc (Hons)  
In progress |  |  |
| 2006 | M.Phil. Biochemistry | Shahzad H. Shah |
| 2006 | M.Phil. Biochemistry | Iram Batool |
| 2006 | M.Phil. Biochemistry | Tauseef Tabassum |
| 2006 | M.Phil. Biochemistry | Saira Hussain |
| 2006 | M.Phil. Biochemistry | Muhammad Fiaz |

| M.Phil., M.Sc (Hons)  
Completed |  |  |
| 2010 | M.Phil. Biology | M. Usman Farooq |
| 2010 | M.Phil. Biochemistry | Farah Deeba |
| 2010 | M.Phil. Biochemistry | Farah Deeba |
| 2010 | M.Phil. Biochemistry | Safia Janjua |
| 2010 | M.Phil. Biochemistry | Sidra Younas |
| 2009 | M.Phil. Biochemistry | Sidra Batool |
| 2009 | M.Phil. Biochemistry | Nadia Majeed |
| 2009 | M.Phil. Biochemistry | Tasawar Sultana |
| 2009 | M.Phil. Biochemistry | Fariha Khan |
| 2009 | M.Phil. Biochemistry | Irtiza H. Shah Gardezi |
| 2009 | M.Phil. Biochemistry | Dure Shahwar |
| 2009 | M.Phil. Biochemistry | Shahzad H. Shah |
| 2009 | M.Phil. Biochemistry | Muhammad Fiaz |
| 2008 | M.Phil. Biochemistry | Tauseef Tabassum |
| 2008 | M.Phil. Biochemistry | Amna Khan |
| 2008 | M.Phil. Biochemistry | Saira Hussain |
| 2008 | M.Phil. Biochemistry | Iram Batool |

**Member Supervisory Committees**  
(Completed) ~25  
(Degrees in Food Technology, Plant Pathology, and Plant Breeding & Genetics)

| In Progress |  |  |
|  |  |  |

| Ph.D. Thesis  
Completed |  |  |
| 2010 | Ph.D. Biochemistry | Saeeda Raza |
| 2009 | Ph.D. Biochemistry | Tayyaba Yasmin |

Department of Biochemistry  
Department of Plant Breeding & Genetics

---

*Note: The table may contain some abbreviations which are not fully explained in the text.*
<table>
<thead>
<tr>
<th>Year</th>
<th>Field</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>Ph.D. Biochemistry</td>
<td>M. Zeeshan Hyder</td>
</tr>
<tr>
<td>2008</td>
<td>Ph.D. Biochemistry</td>
<td>Aish Muhammad</td>
</tr>
<tr>
<td>2007</td>
<td>Ph.D. Biochemistry</td>
<td>Tariq Mahmood</td>
</tr>
<tr>
<td>2007</td>
<td>Ph.D. Biochemistry</td>
<td>Abid Mahmood</td>
</tr>
</tbody>
</table>

*(Membership in Supervisory Committees)*

<table>
<thead>
<tr>
<th>Department</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Biochemistry</td>
<td>3</td>
</tr>
<tr>
<td>Department of Botany</td>
<td>2</td>
</tr>
<tr>
<td>Department of Zoology</td>
<td>2</td>
</tr>
<tr>
<td>Department of Entomology</td>
<td>1</td>
</tr>
<tr>
<td>Department of Food Technology</td>
<td>2</td>
</tr>
<tr>
<td>Department of Plant Pathology</td>
<td>2</td>
</tr>
<tr>
<td>Department of Plant Breeding &amp; Genetics</td>
<td>1</td>
</tr>
<tr>
<td>Department of Agronomy</td>
<td>1</td>
</tr>
</tbody>
</table>
SERVICE ACTIVITY

Total experience (>28 YEARS)

HIGHER EDUCATION

May 2009  (todate)  Chairman/Professor TTS
Department of Biochemistry
University of Arid Agriculture
Rawalpindi, 46300-Pakistan

May 2007-May 2009  Chairman/Professor
Department of Biochemistry
University of Arid Agriculture
Rawalpindi, 46300-Pakistan

Aug 2006-May 2007  Professor
Department of Biochemistry
University of Arid Agriculture
Rawalpindi, 46300-Pakistan

Dec 1999-Aug2006  Associate Professor
Department of Biochemistry
University of Arid Agriculture
Rawalpindi, 46300-Pakistan

Dec 1990-May 1993  Teaching/Research Assistant
Biology Department
Middle East Technical University,
Ankara, Turkey

RESEARCH

May 1995-Nov 1999  Senior Scientific Officer
Agricultural Biotechnology Institute
Pakistan Agricultural Research Council
Islamabad, Pakistan

Jan 1986-April 1995  Scientific Officer
Agricultural Biotechnology Institute
Pakistan Agricultural Research Council
Islamabad, Pakistan

July 1985-Jan 1986  Assistant Director
National Research Institute for Reproductive Physiology
National Institute of Health
Islamabad, Pakistan

June 1985-July 1985  Abstractor/Indexer
Pakistan Scientific & Technological Information Center
Pakistan Science Foundation
Islamabad, Pakistan

INDUSTRY

Mar 1979-May 1985  Assistant Manager II (Quality Control/Production)
Ghee Corporation of Pakistan.

Misc. ASSIGNMENTS/MEMBERSHIPS

In UAAR

- **Chairman**, Department of Biochemistry, UAAR (02.05.2007–todate)
- **Acting Chairman**, Department of Biochemistry, UAAR (16.8.2005 to 08.09.2005)
- **Acting Chairman**, Department of Biological Sciences, UAAR (05.8.2002 to 22.10.2002)
- **Incharge Biochemistry, development Program**, UAAR (Since 12.02.2001)
- **Member Academic Council**, UAAR (1999–todate)
Associate Editor, Journal of Arid Agriculture, UAAR (2001~2003)

Other Institutions
- Vice President, Pakistan Botanical Society.
- Member, HEC National Curriculum Revision Committee for Bioinformatics
- Technical Expert (Biotechnology), Selection Board, NWFP Agriculture University, Peshawar (Since 2002).
- Member Institutional Review Board, Quaid-i-Azam University, Islamabad. (2003-2006).
- External Examiner of Quaid-i-Azam University, NWFP Agriculture University, University of AJ&K and Bahauddin Zakaria University for M.Sc./M.Phil. and Ph.D. examination.
- Resource person for College Teachers Refresher Courses by HEC.

TEACHING

Post-Graduate courses
- Plant Molecular Physiology (2007)
- Molecular Biology (2000~2007)
- Cell and Tissue Culture (1999~2007)
- Advances in Biotechnology (2002~2006)
- Bioinformatics (2004, 2007)
- Biochemistry (2000)
Publications in HEC Journal carrying Impact Factor


In other HEC recognized Journals


Publications in Other National/International Journals


Annex - VII

Edited Books

Research Reports Submitted to Sponsored

Completed Projects: Six monthly and annual technical progress of:-

a. ALP Project No. 01-03-01-19

b. PSF Project No. R&D/P-UA/AA/Biotech (220)
## Research Grants and Contracts

### Completed:

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Agency/Organization</th>
</tr>
</thead>
</table>
| 3 years  | Co-Principal Investigator  
Marker assisted wheat breeding for rust resistance. Pak-China collaborative project.  
Cost: Rs. 3.5 million | Ministry of Sciences and Technology, Govt. of Pakistan                              |
| 4 years  | Principal Investigator  
Investigation of role of Germin-like proteins (Glps) during germination and early development by construction of rice plants engineered for sense and anti-sense expression of rice glps.  
Cost Rs. 2.473 million | Project No. 01-03-01-19 Agric. Linkages Prog., PARC.                               |
| 4 years  | Co-Principal Investigator  
Cloning, over-expression of somatotropin and its use as a lactogenic agent in indigenous buffalo breeds.  
Cost: Rs. 29.625 million | Higher Education Commission/Ministry of Science and Technology, Govt. of Pakistan   |
| 4 years  | Principal Investigator  
Tissue culture and genetic transformation studies in banana (*Musa*) for disease eradication/disease resistance.  
Cost Rs: 0.873 million | Project R&D/P-UAA/Biotech (220) Pakistan Science Foundation                        |

### On Going

| Duration: 3 years | Principal Investigator  
Study of polyphenol oxidase activity and its association with molecular markers in different wheat genotypes.  
Cost Rs. 3.789 million | Project 250-584/R&D/06 Higher Education Commission                                    |
# Faculty Resume

<table>
<thead>
<tr>
<th><strong>Name</strong></th>
<th>Dr. Muhammad Gulfraz</th>
</tr>
</thead>
</table>
| **Personal** | Professor Department of Biochemistry  
PMAS Arid Agriculture University Rawalpindi |
| **Experience** | **31-1- 2010**  
PMAS Arid Agriculture University  
**Professor**  
August 2003  
February 1998  
February 1987  
Associate Professor  
Assistant Professor  
Lecturer |
| **Honor and Awards** | One and half years scholarship awarded by DAAD  
1992-93  
3 Months Scholarship awarded by DAAD  
2002  
3 Months Scholarship awarded by HEC  
2005  
One year post doctorate Scholarship awarded by HEC  
2006-07 |
| **Memberships** | Member of Biochemical society of Pakistan |
| **Graduate Students** | **Years**  
2010  
2009  
December, 2008  
Degree  
Ph.D Biochemistry  
Ph.D Biochemistry  
Ph.D Biochemistry  
Name  
Ms. Farida Iftakhar  
Mr. Asif Ahmed  
Mr. Sajid Mehmood |
| **Postdocs** | 12 M.Phil  and 15 M.Sc thesis work was supervised |
| **Undergraduate Students** | **Honour Students**  
| **Service Activity** | **Professor Department of Biochemistry**  
Member Academic Council  
Member Examination committee  
Hostel Superintendent  
Member Board of Studies |
| **Brief Statement of Research Interest** | **Natural Product Chemistry**  
(i) Isolation Purification and analysis of active ingredients for drug discoveries  
**Fermentation Biotechnology**  
(ii) Production of Bioethanol and Biodiesel from agriculture waste and plant sources |


17. Irshad U. H, S. Ajmal, M. Munir and M. Gulfraz. 2010. Genetic action studies of different Quantitative traits in maize. Pak. J. Bot. 42 (2); 1021-1030. impact factor 0.5


23. M. Gulfraz. 2010. Quality assessment and antimicrobial activity of various honey types of Pakistan Australian journal of food and nutrition Accepted.


HEC non Recognized National Journals

48. Mehmood. S. M. Gulfraz, N.F. Rana and A. Ahmad.2008. Saccharomyces cereissiae strain BF001 Internal transcribed space, partial sequence 5.8S ribosomal RNA gene, complete sequence and internal transcribed spacer 2, partial sequence Accession No (GenBank) EU 551472
### Research Grants and Contracts

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Agency / Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004-2008</td>
<td>Production and utilization of biofuels from sweet sorghum</td>
<td>Funded by HEC (Completed)</td>
</tr>
<tr>
<td>2009-upto</td>
<td>Isolation purification and Monetary analysis of edible oil from wild olive</td>
<td>Funded by HEC (In progress)</td>
</tr>
<tr>
<td>2010</td>
<td>Production of ethanol and butanol from Agricultural and municipal waste</td>
<td>Funded by HEC (Grant sanction but fund not yet release)</td>
</tr>
</tbody>
</table>

### Other Research or Creative Accomplishments

- **Organizing of works/ conferences**
  - 6 days works on separation techniques during 2006
  - 2 days training workshop on biofuels during 2010

### Selected Professional Presentations

- **International seminar**
  - Utilization of Cellulosic Biomass of Agriculture Wastes for Production of Biofuel
  - 14-15 October, 2010
  - Academy of Sciences Islamabad Pakistan

- Biofuels as source of energy
- 2 days training workshop, April 2010.
# Faculty Resume

<table>
<thead>
<tr>
<th>Name</th>
<th>Dr. Ghazala Kaukab Raja</th>
</tr>
</thead>
</table>

## Personal

*May include address(s) and phone number(s) and other personal information that the candidate feels is pertinent.*

Department of Biochemistry, Pir Mehar Ali Shah Arid Agriculture University Rawalpindi. Phone: 9062 215

## Experience

List current appointment first, each entry as follows:

**Date, Title, Institution.**

- **28th April 2007-Present** Associate Professor
  Department of Biochemistry, PMAS Arid Agriculture University Rawalpindi
- **27th October 2001- 28th April 2007** Assistant Professor
  Department of Biochemistry, PMAS Arid Agriculture University Rawalpindi
- **26th August 1999- 27th October 2001** Lecturer
  Department of Biochemistry, PMAS Arid Agriculture University Rawalpindi
- **March 1999-July 1999** Visiting Lecturer
  Department of Biochemistry, PMAS Arid Agriculture University Rawalpindi

## Honor and Awards

List honors or awards for scholarship or professional activity.

- **PhD Scholarship:** Funded by John Crawford Scholarship Scheme, Australia
- **Postdoctoral Research Fellowship** November 2003-September 2004 Funded by Ministry of Science and Technology, Pakistan

## Memberships

List memberships in professional and learned Societies, indicating offices held, committees, or other specific assignments.

## Graduate Students

List supervision of graduate students, postdocs & undergraduate honors theses showing:

<table>
<thead>
<tr>
<th>Years</th>
<th>Degree</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 2009</td>
<td>PhD</td>
<td>Nafeesa Qudsiya Hanif</td>
</tr>
<tr>
<td>2. 2008</td>
<td>M.Phil</td>
<td>Rizwana Abdul Ghani</td>
</tr>
<tr>
<td>3. 2008</td>
<td>M.Phil</td>
<td>Abid Mehmood</td>
</tr>
<tr>
<td>4. 2008</td>
<td>M.Phil</td>
<td>Shagufta Jabeen</td>
</tr>
<tr>
<td>5. 2009</td>
<td>M.Phil</td>
<td>Abdul Rehman</td>
</tr>
<tr>
<td>6. 2009</td>
<td>M.Phil</td>
<td>Muhammad Saqlain</td>
</tr>
<tr>
<td>7. 2009</td>
<td>M.Phil</td>
<td>Nazia Shaheen</td>
</tr>
<tr>
<td>8. 2009</td>
<td>M.Phil</td>
<td>Nasib Zaman</td>
</tr>
<tr>
<td>9. 2010</td>
<td>M.Phil</td>
<td>Iffat Tahir</td>
</tr>
</tbody>
</table>

Show other information & list membership on graduate degree committees.

## Service Activity

List University and public service activities

1. Member Departmental (Biochemistry) Board of Studies
2. Member Faculty (Sciences) Board of Studies
3. Member University Academic Council
4. Member Biochemistry M.Phil, PhD Comprehensive Examination Committee
5. Member M.Sc Hons. M.Phil, PhD Comprehensive Examination Committees
6. Member Biochemistry Scrutiny Committee for PhD Synopsis/Thesis
7. Departmental (Biochemistry) Student Advisor

**POST-GRADUATE COURSES TAUGHT/ TEACHING**

**Lectures Courses:**

Protein Chemistry, Bio-membranes, Numerical problems in biochemistry, Proteomics, Principles of biotechnology, Fundamentals of biotechnology
### Brief Statement of Research Interest

May be as brief as a sentence or contain additional details up to one page in length.

**Current Research Interests:** Exercise Biochemistry, Metabolism, Genetic polymorphism

### Research Grants and Contracts

Entries should include:

- **Date**
- **Title**
- **Agency / Organization**
- **Total Award Amount**

Segment the list under following headings:

- Completed
- Funded and in progress
- In review

1. 2002-2003: Cloning of RG1 from Rat Skeletal Muscle
   - University of Arid Agriculture Rawalpindi. (Completed)

2. 2010: Prevalence of Non-alcoholic fatty liver disease (NAFLD) in Pakistani Population
   - Pakistan Science Foundation (Funded and in progress)

3. 2010, Identification of genetic risk factors for metabolic diseases in Pakistani populations INSPIRE (Submitted)

### Other Research or Creative Accomplishments

List patents, software, new products developed, etc.

### Publications

List publications in standard bibliographic format with earliest date first.

- Manuscripts accepted for publication should be included under appropriate category as “in press;”
- Segment the list under the following standard headings:
  
  - Articles published by refereed journals.
  - Books.
  - Scholarly and / or creative activity published through a refereed electronic venue.
  - Contribution to edited volumes.
  - Papers published in refereed conference proceedings.
  - Paper or extended abstracts published in conference proceedings. (referred on the basis of abstract)
  - Articles published in popular press.
  - Articles appearing in in-house organs.
  - Research reports submitted to sponsors.
  - Articles published in non-refereed journals.
  - Manuscripts submitted for publication. (include where and when submitted).


female patients along with different risk factors. Int. J. Agri. Biol. 9 (5). 735-740


**Research Grants and Contracts.**

<table>
<thead>
<tr>
<th>Entries should include:</th>
<th>Date</th>
<th>Title</th>
<th>Agency / Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Completed</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Funded and in progress</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>In review</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total Award Amount      |                              |

Segment the list under following headings:

1. 2002-2003: Cloning of RG1 from Rat Skeletal Muscle University of Arid Agriculture Rawalpindi. **(Completed)**

2. 2010: Prevalence of Non-alcoholic fatty liver disease (NAFLD) in Pakistani Population Pakistan Science Foundation **(Funded and in progress)**

3. 2010, Identification of genetic risk factors for metabolic diseases in Pakistani populations **INSPIRE (Submitted)**

**Other Research or Creative Accomplishments**

| List patents, software, new products developed, etc. |
Proforma 9

Faculty Resume

<table>
<thead>
<tr>
<th>Name</th>
<th>Dr Muhammad Javaid Asad</th>
</tr>
</thead>
</table>

**Personal**
- **Assistant Professor**
- Department of Biochemistry
- Arid Agriculture University Rawalpindi
- 46300-Pakistan.
- Ph. No. +92-51-9062268, 92-51-9290151-2, Ext.171/146

**Experience**
- 14-10-06 to date: Assistant Professor Department of Biochemistry PMAS Agriculture University Rawalpindi.
- 01-07-04 to 14-10-06: Lecturer Department of Chemistry and Biochemistry, University Faisalabad.
- 11-01-01 to 30-06-04: Assistant Professor Department of Biochemistry, Independent Medical College, Faisalabad.

**Honor and Awards**
Availed Post Doctorate Fellowship awarded by HEC from 2009-2010 in Biotechnology.
Approved Ph.D. supervisor (Biochemistry), Higher Education Commission of Pakistan.
Issued appreciation letter by Vice Chancellor, University of Arid Agriculture Rawalpindi for delivering technical lecture as Resource person to participants of International Workshop on Techniques Related to Molecular Biology and Immunology, held at Department of Biochemistry University of Arid Agriculture Rawalpindi. (December 18-23, 2006)
Issued appreciation letter by Vice Chancellor, University of Arid Agriculture Rawalpindi for delivering technical lecture as Resource person to participants of International Workshop on RT-PCR, held at Department of Biochemistry University of Arid Agriculture Rawalpindi. (June 8-11, 2010)

**Memberships**
- Biochemical Society, Department of Chemistry and Biochemistry, University of Agriculture, Faisalabad. (Permanent Member)
- The Biochemical Society UK (2005-to date)
- Canadian Society of Biochemistry, Molecular and Cell Biology (CSBMCB), (2005-to date)
- Pakistan Society of Biochemistry and Molecular Biology (permanent member)
- Pakistan Society of Food Scientists and Technologists (permanent member).
- International Society of Environmental Sciences, University of Karachi (permanent member).
- Pakistan Society for Microbiology, Department Microbiology QAU Islamabad (permanent member)
- Pakistan Botanical Society (2007-to date)
- Pakistan Phyto Pathological Society (2007-to date)

**Graduate Students**
Member Supervisory Committees of M.phil/M.Sc.
- Department of Biochemistry 10
- Department of Botany 6
- Department of zoology 7
- Department of Agronomy 1
- Department of Plant Pathology 5
- Department of Plant Breeding and Genetics 6

**Postdocs**

**Undergraduate Students**

**Honour Students**

**Department of Biochemistry 5**
| Department of Entomology   | 1 |
| Department of zoology      | 2 |
| **M.Phil, M.Sc. students in progress.** | |
| 2009 M.Phil. Biochemistry  | 3 |
| 2009 M.Phil Biology        | 1 |

| Service Activity | Teaching and Research |
**Brief Statement of Research Interest**

Fermentation process development | Bioconversion of lignocellulosic biomass and production of amylases, cellulases and lignases, single cell protein, organic acids and other industrial products. Biocatalysis: Enzyme kinetics, purification, characterization, enzyme engineering, immobilization and industrial application of microbial enzymes; Liquid and solid waste management. Bioremediation of textile dyes and industrial effluents by white rot fungi, Biosediel, Bioenergy and Nutrition.

**Publications**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>


### Research Grants and Contracts.

**Entries should include:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Agency / Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Completed</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Funded and in progress</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>In review</strong></td>
</tr>
</tbody>
</table>

### Other Research or Creative Accomplishments

*List patents, software, new products developed, etc.*

### Selected Professional Presentations
# Faculty Resume

<table>
<thead>
<tr>
<th>Name</th>
<th>M. SHEERAZ AHMAD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal</strong></td>
<td>M. SHEERAZ AHMAD</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td></td>
</tr>
<tr>
<td>Department of Biochemistry,</td>
<td></td>
</tr>
<tr>
<td>PMAS-Arid Agriculture University Rawalpindi, Pakistan.</td>
<td></td>
</tr>
<tr>
<td>Tel: +92-333-5706221</td>
<td></td>
</tr>
<tr>
<td>Email: <a href="mailto:dr.sheeraz@uaar.edu.pk">dr.sheeraz@uaar.edu.pk</a></td>
<td></td>
</tr>
<tr>
<td><strong>Experience</strong></td>
<td>M. SHEERAZ AHMAD</td>
</tr>
<tr>
<td>Assistant Professor Ad-Hoc BPS-19, (01-04-2010 to Continue),</td>
<td></td>
</tr>
<tr>
<td>Department of Biochemistry, PMAS-Arid Agriculture University Rawalpindi, Pakistan.</td>
<td></td>
</tr>
<tr>
<td>Lecturer BPS-18, (10-09-2008 to 01-04-2010), Department of</td>
<td></td>
</tr>
<tr>
<td>Biochemistry, PMAS-Arid Agriculture University Rawalpindi, Pakistan.</td>
<td></td>
</tr>
<tr>
<td><strong>Honor and Awards</strong></td>
<td>M. SHEERAZ AHMAD</td>
</tr>
<tr>
<td>HEC Approved PhD Supervisor</td>
<td></td>
</tr>
<tr>
<td>Throughout First Divisions in Academic Career</td>
<td></td>
</tr>
<tr>
<td>Position in M.Sc with 84.5% marks</td>
<td></td>
</tr>
<tr>
<td>Merit Scholarship of QAU in M.Phil on having 95% marks in M.Phil</td>
<td></td>
</tr>
<tr>
<td>Merit List</td>
<td></td>
</tr>
<tr>
<td>HEC PhD Scholarship (2004-2008) Pakistan</td>
<td></td>
</tr>
<tr>
<td>IRSP, HEC Scholarship for PhD Research in Lancaster University UK</td>
<td></td>
</tr>
<tr>
<td>GRE (Biochemistry, Cell and Molecular Biology) ETS, USA in April 2007</td>
<td></td>
</tr>
<tr>
<td><strong>Memberships</strong></td>
<td>M. SHEERAZ AHMAD</td>
</tr>
<tr>
<td>---</td>
<td></td>
</tr>
<tr>
<td><strong>Graduate Students</strong></td>
<td>M. SHEERAZ AHMAD</td>
</tr>
<tr>
<td>Years</td>
<td>Degree</td>
</tr>
<tr>
<td>2010</td>
<td>M. Phil</td>
</tr>
<tr>
<td><strong>Postdocs</strong></td>
<td>M. SHEERAZ AHMAD</td>
</tr>
<tr>
<td><strong>Undergraduate Students Honour</strong></td>
<td>M. SHEERAZ AHMAD</td>
</tr>
<tr>
<td><strong>Students</strong></td>
<td>M. SHEERAZ AHMAD</td>
</tr>
<tr>
<td><strong>Service Activity</strong></td>
<td>M. SHEERAZ AHMAD</td>
</tr>
<tr>
<td>Teaching M.Sc, M.Phil and PhD courses.</td>
<td></td>
</tr>
<tr>
<td>Demonstrating practical to the graduate classes.</td>
<td></td>
</tr>
<tr>
<td>Supervising PhD and M.Phil Research Students.</td>
<td></td>
</tr>
<tr>
<td><strong>Brief Statement of Research Interest</strong></td>
<td>M. SHEERAZ AHMAD</td>
</tr>
<tr>
<td>Biochemistry, Plant Biotechnology.</td>
<td></td>
</tr>
<tr>
<td>Publications</td>
<td>List publications in standard bibliographic format with earliest date first.</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>PUBLICATIONS:</td>
<td></td>
</tr>
</tbody>
</table>
| 9. Muhammad Hanif, Mukhtiar Hussain, Saqib Ali, Moazzam H. Bhatti, **Muhammad Sheeraz Ahmad**, Bushra Mirza and Helen S. Evans: Synthesis, Spectroscopic Investigation, Crystal Structure, and Biological Screening, Including Antitumor

**ACCEPTED MANUSCRIPTS:**


**SUBMITTED MANUSCRIPTS:**


2. Farzana Ramzan, Muhammad Sheeraz Ahmad: Biological Activities of *Polygonum amplexicaulis* rhizome extract. (under construction)

**ABSTRACT PUBLICATIONS:**


<table>
<thead>
<tr>
<th>Research Grants and Contracts.</th>
<th>2009-2010  “Determination of antioxidant potential of <em>Polygonum amplexicaule</em> and its suitability for cosmetics” AAUR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010-2010  “Determination of Biological Activities and Micropropagation of <em>Polygonum amplexicaulis</em>: a popular medicinal plant of North Pakistan.” Approved by PSF technical committee on biotechnology. Rs. 1.8 million</td>
</tr>
</tbody>
</table>

**Other Research or Creative Accomplishments**

---

**Selected Professional Presentations**

Resource person for “Basics of Laboratory Biosafety” Session in HEC/AAUR Workshop on RT-PCR

Resource person for “Fermentation Biotechnology” Session in Two days “Training Workshop on Biofuel Production from Agriculture Waste”, PMAS-Arid Agriculture University Rawalpindi, Pakistan, April 13-14, 2010.
## Faculty Resume

<table>
<thead>
<tr>
<th>Name</th>
<th>Prof. Dr. Azra Khanum</th>
</tr>
</thead>
</table>

### Personal

**Professor of Biochemistry**  
Pir Mehr Ali Shah Arid Agriculture University Rawalpindi (PMAS-AAUR) Murree Road, Rawalpindi 46300 - Pakistan  
Tel: 92-051-445 1772  
Fax: 92-051-4845623  
azrakhanum@uaar.edu.pk; akhanum@hotmail.com; azkiak@yahoo.com

### Experience

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Institution</th>
</tr>
</thead>
</table>
| February 9, 2009 to date | Professor | Department of Biochemistry  
Pir Mehr Ali Shah Arid Agriculture University Rawalpindi, Murree Road, Rawalpindi, 46300 Pakistan |
| February 9, 2009 to date | Director | Division of Continuing Education, Home Economics & Women Development  
Pir Mehr Ali Shah Arid Agriculture University Rawalpindi, Murree Road, Rawalpindi, 46300 Pakistan |
| February 9, 2009 to date | Chairperson | Department of Sociology and Anthropology  
Pir Mehr Ali Shah Arid Agriculture University Rawalpindi, Murree Road, Rawalpindi, 46300 Pakistan |
| April 24, 2007 to Feb. 8, 2009 | Dean | Faculty of Sciences  
Pir Mehr Ali Shah Arid Agriculture University Rawalpindi, Murree Road, Rawalpindi, 46300 Pakistan |
| May, 2007 to Feb. 8, 2009 | Acting Director | Division of Continuing Education, Home Economics & Women Development  
Pir Mehr Ali Shah Arid Agriculture University Rawalpindi, Murree Road, Rawalpindi, 46000, Pakistan |
| May, 2007 to Feb. 8, 2009 | Acting Chairperson | Department of Statistics / Mathematics  
Pir Mehr Ali Shah Arid Agriculture University Rawalpindi, Murree Road, Rawalpindi, 46000, Pakistan |
| May, 2007 to 15 January, 2009 | Acting Chairperson | Department of Zoology / Biology  
Pir Mehr Ali Shah Arid Agriculture University Rawalpindi, Murree Road, Rawalpindi, 46000, Pakistan |
| August 2003 to April 23, 2007 | Chairperson & Professor | Department of Biochemistry  
Pir Mehr Ali Shah Arid Agriculture University Rawalpindi, Murree Road, Rawalpindi, 46000, Pakistan |
| December 2002 to August 2003 | Chairperson & Professor | Department of Biological Sciences  
Pir Mehr Ali Shah Arid Agriculture University Rawalpindi, Murree Road, Rawalpindi, 46000, Pakistan |
| March 1998 to November 2002 | Chairperson & Asst. Professor | Department of Biological Sciences  
Pir Mehr Ali Shah Arid Agriculture University Rawalpindi, Murree Road, Rawalpindi, 46000, Pakistan |
| August 2002 to September 2002 | Adjunct Scientist | NICHD, NIH, Bethesda, MD, USA |
| August 2001 to September 2001 | Adjunct Scientist | NICHD, NIH, Bethesda, MD, USA |
| August 2000 to September 2000 | Adjunct Scientist | NICHD, NIH, Bethesda, MD, USA |
| July 1999 to September 1999 | Adjunct Scientist | NICHD, NIH, Bethesda, MD, USA |
| December 1997 to January 1998 | TOKTEN Consultant | Department of Biological Sciences, Quaid-e-Azam University, Islamabad, Pakistan |
| March 1995 to October 1997 | Visiting Scientist | NICHD, NIH, Bethesda, MD, USA |
| February 1993 | Guest Scientist | Division of Cellular Biochemistry |
**November 1994**

**The Netherlands Cancer Institute,**

The Netherlands

---

**July 1993 to September 1993**

Adjunct Scientist, NICHD, NIH, Bethesda, MD, USA

---

**May 1990 to September 1990**

Adjunct Scientist, NICHD, NIH, Bethesda, MD, USA

---

**March 1984 to September 1991**

Assistant Professor, Department of Biological Sciences
Quaid-e-Azam University Islamabad, Pakistan

---

**October 1984 to October 1987**

Post-Doctoral Fellow Fellow, NICHD, NIH, Bethesda, MD, USA

---

**January 1979 to February 1984**

Lecturer Department of Biological Sciences
Quaid-e-Azam University, Islamabad, Pakistan

---

**October 1978 to Dec.1978**

Research Officer Department of Biological Sciences
Quaid-e-Azam University, Islamabad, Pakistan

---

**March 1977 to July 1978:**

Research Officer Department of Biological Sciences
Quaid-e-Azam University, Islamabad, Pakistan

---

**April 1974 to December 1976**

Research Associate Department of Physiology
University of Karachi, Karachi Pakistan and
Department of Biological Sciences
Quaid-e-Azam University, Islamabad, Pakistan

---

**May 1972 to March 1974**

Research Fellow Department of Physiology,
University of Karachi, Karachi, Pakistan

---

**Honors and Awards**

- Tamgha-e-Imtiaz, a civil award, 2008
- Best Teacher Award, HEC, 2001.
- Consultant: TOKTEN (Transfer of Knowledge through Expatriate Nationals) Program at Quaid-e-Azam University, Islamabad, Sponsored by United Nation Development Project, National Talent Pool (UNDP-NTP), Ministry of Labor, Manpower and Overseas Pakistan, December 1997-January 1998
- Visiting Scientist, NIH, MD, USA 1995-1997
- International Fogarty Post Doctoral Fellow, NIH, MD, USA 1984-1987

---

**Memberships**

- Fellow - Pakistan Academy of Sciences, Pakistan, 2005
- Fellow - Pakistan Academy of Medical Sciences, Pakistan, 2003
- Fellow - Zoological Society of Pakistan, 2000
- Member - Chemical Society of Pakistan, 2007
- Member - Agriculture Foundation Pakistan 2006
- Member - American Association for the Advancement of Science, USA, 2005
- Member - Endocrine Society, USA, 2002
- Member - American Society for Biochemistry and Molecular Biology, USA, 2001
- Member - Society for Biochemistry and Molecular Biology of Pakistan, 1999
- Member – New York Society of Sciences, USA, 1998
<table>
<thead>
<tr>
<th>Year</th>
<th>Degree</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>M.Sc. (Biochemistry)</td>
<td>Syed Irtiza Hussain</td>
</tr>
<tr>
<td>2005</td>
<td>-do-</td>
<td>Azmat Sohail</td>
</tr>
<tr>
<td>2005</td>
<td>-do-</td>
<td>Asima Zia</td>
</tr>
<tr>
<td>2005</td>
<td>-do-</td>
<td>Jamil Akhtar</td>
</tr>
<tr>
<td>2005</td>
<td>-do-</td>
<td>Muhammad Rizwan Alam</td>
</tr>
<tr>
<td>2005</td>
<td>-do-</td>
<td>Khawar Sohail Abbasi</td>
</tr>
<tr>
<td>2005</td>
<td>-do-</td>
<td>Sumera Naz</td>
</tr>
<tr>
<td>2005</td>
<td>M. Sc. (Biology)</td>
<td>Saima Rehman</td>
</tr>
<tr>
<td>2005</td>
<td>-do-</td>
<td>Muhammad Saqlain</td>
</tr>
<tr>
<td>2005</td>
<td>-do-</td>
<td>Qudsia Bashir</td>
</tr>
<tr>
<td>2004</td>
<td>-do-</td>
<td>Muhammad Khan Jadoon</td>
</tr>
<tr>
<td>2004</td>
<td>-do-</td>
<td>Sardar Faisal Mahmood</td>
</tr>
<tr>
<td>2003</td>
<td>-do-</td>
<td>Irum Nawaz Awang</td>
</tr>
<tr>
<td>2003</td>
<td>-do-</td>
<td>Imran Shaltaz Mirza</td>
</tr>
<tr>
<td>2003</td>
<td>-do-</td>
<td>Reheela Ashraf</td>
</tr>
<tr>
<td>2003</td>
<td>-do-</td>
<td>Noorain Yaqoob</td>
</tr>
<tr>
<td>2003</td>
<td>-do-</td>
<td>Amtul Waddo Wajeeha</td>
</tr>
<tr>
<td>2003</td>
<td>-do-</td>
<td>Sidra Saleem</td>
</tr>
<tr>
<td>2002</td>
<td>-do-</td>
<td>Muhammad Zia-ul-Haq</td>
</tr>
<tr>
<td>2000</td>
<td>-do-</td>
<td>Irum Mahmood</td>
</tr>
<tr>
<td>2009</td>
<td>M. Phil (Biochemistry)</td>
<td>Aamir Ali Khattak</td>
</tr>
<tr>
<td>2009</td>
<td>-do-</td>
<td>Munazza Fatima</td>
</tr>
<tr>
<td>2009</td>
<td>-do-</td>
<td>Sadia Rahim</td>
</tr>
<tr>
<td>2008</td>
<td>-do-</td>
<td>Nadiya Sial</td>
</tr>
<tr>
<td>2008</td>
<td>-do-</td>
<td>Hahaha Islam Butt</td>
</tr>
<tr>
<td>2008</td>
<td>-do-</td>
<td>Sadiq Noor Khan</td>
</tr>
<tr>
<td>2008</td>
<td>-do-</td>
<td>Syed Kumail Ali Rizvi</td>
</tr>
<tr>
<td>2009</td>
<td>M. Phil (Biology)</td>
<td>Uzma Jabeen</td>
</tr>
<tr>
<td>2009</td>
<td>-do-</td>
<td>Hafiz Muhammad Tahir</td>
</tr>
<tr>
<td>2008</td>
<td>-do-</td>
<td>Saima Rehman</td>
</tr>
<tr>
<td>2008</td>
<td>-do-</td>
<td>Qudsia Bashir</td>
</tr>
<tr>
<td>1989</td>
<td>M. Phil (Biochemistry/Molecular Biology)-QAU</td>
<td>Ishrat Waheed</td>
</tr>
<tr>
<td>1984</td>
<td>-do-</td>
<td>Waseem Ahmad</td>
</tr>
<tr>
<td>1984</td>
<td>-do-</td>
<td>Syed Muhammad Sagar Naqvi</td>
</tr>
<tr>
<td>1983</td>
<td>-do-</td>
<td>Muhammad Ishtiaq Qadri</td>
</tr>
<tr>
<td>2009</td>
<td>Ph.D. (Biochemistry)</td>
<td>Rakshshada Munir</td>
</tr>
<tr>
<td>2008</td>
<td>-do-</td>
<td>Sumbul Khalid</td>
</tr>
<tr>
<td>2008</td>
<td>-do-</td>
<td>Tanvir Ahmad</td>
</tr>
<tr>
<td>2008</td>
<td>-do-</td>
<td>Darakhshanda Kaukab</td>
</tr>
<tr>
<td>2007</td>
<td>-do-</td>
<td>Raja Razi Ul Hussnain</td>
</tr>
</tbody>
</table>

Member, Supervised Committee

<table>
<thead>
<tr>
<th>Year</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>M.Sc. Anthropology</td>
</tr>
<tr>
<td>2009</td>
<td>M. Sc. (Biochemistry)</td>
</tr>
<tr>
<td>Year</td>
<td>Degree</td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
</tr>
<tr>
<td>2005</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2005</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2004</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2004</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2004</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2004</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2004</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2004</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2003</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2003</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2002</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2002</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2005</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2005</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2005</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2005</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2005</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2005</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2005</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2005</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2005</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2004</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2004</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2003</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2003</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2003</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2003</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2003</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2003</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2003</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2003</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2002</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2009</td>
<td>Ph.D</td>
</tr>
<tr>
<td>2009</td>
<td>Ph.D</td>
</tr>
<tr>
<td>2008</td>
<td>Ph.D</td>
</tr>
<tr>
<td>2008</td>
<td>Ph.D</td>
</tr>
<tr>
<td>2008</td>
<td>Ph.D</td>
</tr>
<tr>
<td>2009</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2008</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2008</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2009</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2009</td>
<td>Ph.D</td>
</tr>
<tr>
<td>2009</td>
<td>Ph.D</td>
</tr>
<tr>
<td>2009</td>
<td>Ph.D</td>
</tr>
<tr>
<td>2008</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2008</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2007</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2007</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2009</td>
<td>Ph.D</td>
</tr>
<tr>
<td>2009</td>
<td>Ph.D</td>
</tr>
<tr>
<td>2008</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2008</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2007</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2007</td>
<td>M. Phil</td>
</tr>
<tr>
<td>2006</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2007</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2005</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2005</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>2006</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>1999</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>1999</td>
<td>M. Sc.</td>
</tr>
<tr>
<td>1999</td>
<td>M. Sc.</td>
</tr>
</tbody>
</table>
Thesis Supervising

<table>
<thead>
<tr>
<th>M.Phil in Biochemistry</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2009-onward -do-</td>
<td>Sofia Naseem</td>
</tr>
<tr>
<td>2009-onward -do-</td>
<td>Madia Khalid</td>
</tr>
<tr>
<td>2009-onward -do-</td>
<td>Maryam Yousuf</td>
</tr>
<tr>
<td>2010-onward -do-</td>
<td>Ayesha Iftikhar</td>
</tr>
<tr>
<td>2010-onward -do-</td>
<td>Irum Shaheen</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biology</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2009-onward -do-</td>
<td>Irum Naheed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ph.D. (Biochemistry)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Submitted-2010 -do-</td>
<td>Imran Shahzad</td>
</tr>
<tr>
<td>-do-</td>
<td>Irum Nawaz Awan</td>
</tr>
<tr>
<td>2007 - on ward -do-</td>
<td>Sadia Rehman</td>
</tr>
<tr>
<td>2007 - on ward -do-</td>
<td>Sadiq Noor Khan</td>
</tr>
</tbody>
</table>

Member, Supervising Committee (Supervising)

<table>
<thead>
<tr>
<th>M. Phil (Biochemistry)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-onward -do-</td>
<td>Ayesha Yasmin</td>
</tr>
<tr>
<td>2008-onward -do-</td>
<td>Noor ul sabah</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ph.D. (Zoology)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Submitted-2010 -do-</td>
<td>Zafarullah Bhatti</td>
</tr>
<tr>
<td>2009-onward -do-</td>
<td>Majid Mahmood</td>
</tr>
</tbody>
</table>

Service Activity

I. University Service Activities:

- Graduate/Post Graduate Courses taught – 20
- Subject Expert - Various selection boards of different Universities of Sindh, Punjab, NWFP and Federal
- Curriculum Development - M.Sc., M.Phil & Ph.D. Biochemistry at PMAS-AAUR
- Curriculum Revision - M.Sc., Sociology/Anthropology
- Curriculum Development, M.Sc. and M. Phil Education
- Organized - Seminars/Workshops sponsored by HEC/NCB
- Organized Conference - Pakistanian Society for Biochemistry and Molecular Biology
- Organized short courses in English Language and Computer Application
- Reviewer / Evaluator of Projects and Manuscripts - PSF, PCST, PARC, PTCL, PJC, HEC, MoST
- Chairperson - Institutional Bio Safety Committee and Ethics Committee
- Chaired/Co-Chaired - Various sessions in Seminars / Symposia / Conferences of National and International
- Examiner/Evaluator - M.Phil / Ph.D thesis
- Member - Board of Studies of Various Departments of different Universities of Sindh, Punjab, NWFP and Federal
- Attended - Number of Symposia / Seminars / Workshops / Training Courses

II. Public Service Activities.

- Life Member, Institute of Overseas Pakistani (IOP)
- Member, Board of Directions, Institute of Overseas Pakistani (IOP)
- Member, Executive Committee, Overseas Pakistanis Educational Network (OPEN)
- Representative of OPEN on Management Committee of IOP sponsored schools with the cooperation of Prime Minister Literacy Commission (PMLC), 2001
- Wrote articles in Newspapers and Literary Magazines (1966-1972)
- Did Radio Programs on Science (1978-1980)
- Worked as Translator in Scientific Society of Pakistan (1972-74)

Brief Statement of Research Interest

- To express and purify therapeutics using gene cloning techniques or isolate, purify antimicrobial peptide(s) against mammalian pathogens from vegetables like pea, kerala etc using conventional techniques
- Development of Vaccine and Diagnostic method for tuberculosis
- To understand signal transduction mechanisms in eukaryotic cell
- To understand mechanism leads normal cell to become abnormal cell
<table>
<thead>
<tr>
<th>Publications</th>
<th>i. Cumulative Impact Factor: 53.284</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact Factor Journals</strong></td>
<td></td>
</tr>
</tbody>
</table>


HEC Recognized Journals


Other Journals and Proceedings


55. Nusrat ullah Khan, Syed Yasir, Zafar Malik and Azra Khanum. Evaluation of concentration of cardiac enzymes, lipids and their relationship with myocardial


<table>
<thead>
<tr>
<th>Completed</th>
<th>Date</th>
<th>Title</th>
<th>Agency/Organization</th>
<th>Total Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>September 1984-August 1985</td>
<td>Study of epididymal function in the Rhesus monkey (Macaca mulata): Androgen dependent proteins, their characterization and regional distribution</td>
<td>Pakistan Science Foundation, Islamabad</td>
<td>Rs. 86,200</td>
</tr>
<tr>
<td></td>
<td>1989-1990</td>
<td>Development of sensitive in vitro bioassay for the measurement of circulating LH</td>
<td>Quaid-e-Azam University, Islamabad</td>
<td>Rs. 20,000</td>
</tr>
<tr>
<td></td>
<td>1989-1990</td>
<td>Studies on the mechanism of action of LHRH: The role of arachidonic acid and its metabolites</td>
<td>University Grants Commission, Islamabad</td>
<td>Rs. 100,000</td>
</tr>
<tr>
<td></td>
<td>2002-2005</td>
<td>Cloning, over-expression of somatotropin and its use as a lactogenic agent in indigenous buffalo breeds</td>
<td>Ministry of Science and Technology/HEC, Islamabad</td>
<td>Rs. 29.625 millions</td>
</tr>
</tbody>
</table>

- On-going

<table>
<thead>
<tr>
<th>Completed</th>
<th>Date</th>
<th>Title</th>
<th>Agency/Organization</th>
<th>Total Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2007-2010</td>
<td>Multiplex immunoassays for the detection of tuberculosis</td>
<td>HEC-USA</td>
<td>$ 181,535</td>
</tr>
<tr>
<td></td>
<td>2008-2010</td>
<td>Mutator <em>M. tuberculosis</em> in Tehran and Rawalpindi: A comparative study on fingerprinting, mutator genes and antibiotic resistance genes of the isolates.</td>
<td>EMRO-COMSTECH</td>
<td>$ 15,000</td>
</tr>
</tbody>
</table>

Other Research or Creative Accomplishments List patents, software, new products developed, etc. -N/A-
<table>
<thead>
<tr>
<th>Selected Professional Presentations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14. Lectures on Molecular Biology of the Cell, Genetic Engineering and Recombinant DNA in HEC sponsored workshop for College teachers of Biology, 12-17 September, 2005, Department of Biochemistry, University of Arid Agriculture Rawalpindi.</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Title</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>19</td>
<td>Report of work at Department of Biochemistry, University of Arid Agriculture Rawalpindi.</td>
</tr>
<tr>
<td>20</td>
<td>Evaluation and characterization of antimicrobial agents from some seasonal vegetables – edible and inedible parts.</td>
</tr>
<tr>
<td>22</td>
<td>A lecture on Protein Structure and Function in NCB/UAAR Workshop on Biotechnology for Secondary School Teachers.</td>
</tr>
<tr>
<td>23</td>
<td>A lecture on Protein sequencing – An important Tool in Life Sciences – HEC sponsored First National Pakistan proteomics Society Workshop.</td>
</tr>
<tr>
<td>25</td>
<td>A lecture on Protein Structure and Function in NCB/UAAR Workshop on Biotechnology for Secondary School Teachers.</td>
</tr>
<tr>
<td>29</td>
<td>Development of serodiagnosis test and DNA based vaccine for tuberculosis.</td>
</tr>
<tr>
<td>32</td>
<td>Serodiagnosis of tuberculosis by multiplex microbead immunoassay.</td>
</tr>
<tr>
<td>34</td>
<td>Regulatory Mechanisms Involved in Control of Steroidogenesis.</td>
</tr>
<tr>
<td>36.</td>
<td>Regulatory Mechanisms Involved in Control of Steroidogenesis. 3rd National Symposium on “Recent Trends in Endocrinology and Reproductive Sciences Sponsored by the Pakistan Academy of Sciences, Centre for Research in Molecular Medicine, University of Lahore, Lahore. 15-16 May, 2010.</td>
</tr>
<tr>
<td>38.</td>
<td>Regulatory Mechanisms Involved in Control of Steroidogenesis. 3rd National Symposium on “Recent Trends in Endocrinology and Reproductive Sciences Sponsored by the Pakistan Academy of Sciences, Centre for Research in Molecular Medicine, University of Lahore, Lahore. 15-16 May, 2010.</td>
</tr>
</tbody>
</table>
Criterion 7: Institutional Facilities

The institution must have the infrastructure to support new trends in learning such as e-learning including digital publications, library, video conference room and journals etc.

- The library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personnel.
- These aspects need to be strengthened in number and space.
- Class rooms must be air conditioned and adequately equipped and offices must be adequate to enable faculty to carry out their responsibilities.
- The university did not provide computer facility to faculty members which adversely affect the quality of education.

Standard 7-1: Infrastructure:

The faculty has access to E-library which is very helpful for the high quality education and producing research of international standard. They also have access to the internet. However the department has the following shortcomings/problems:

- Majority of the faculty members have their own PCs. Computers are not provided by the university.
- The Internet services provided by the university are poor. The speed of internet is slow and often internet does not work. The telephones are also connected with the internet and the services are often breached.
- Breach of power intermittently, due to which research and academic work both are suffered, however university has provided quite a reasonable back-up by local generator
- Untrained supporting staff.
- Scanty budget for consumables.
- Water coolers are out of order and are not properly and timely repaired.
- Washrooms are inadequate for males and females and as well for staff.
- The common rooms for male and female are not available in whole university
- Lifts are not available.

Standard 7-2: Library Facilities:

The University Central Library has very limited number of books, journals and periodicals. It’s a small library in term of space and facilities with no catalogue systems. It does not meet the standards of a University Library. However department itself owns few books.

Standard 7.3: Class Room and Faculty Offices

Currently the class rooms are not enough and the space is not only limited but also some basic facilities are lacking. Multimedia are not available for the lecture halls. Lecture rooms are not air conditioned and well ventilated, due to which teachers and students face extreme difficulty in summer. Many time students faint in class-rooms and need to be transported to medical facility/hospitals. Practical lab space is also lacking. This affects the quality of teaching. The faculty offices are another serious problem of the department. Some faculty members are sharing small rooms and the others are having their desks in the laboratories.

Criterion 8: Institutional Support

Unfortunately, this aspect is very weak; however it will be addressed after moving in to new building.

- There must be sufficient support and financial resources to attract and retain high quality faculty and provide the means for them to maintain competence as teachers and scholars.
Space limitation is the major constraint in the development and strengthening of discipline.

Insufficient secretarial support, technical staff and office equipment Due to unavailability of classrooms, classes are taken in the labs.

The department at present avails all the human resources.

Faculty offices are inadequate and therefore two or three teachers share one office room

The university administration has been struggling hard to strengthen all the departments, upgradation of departments and establishing new faculties and Institutes.

Support and Financial Resources

At present department is having a very meager financial resource to maintain its present needs. Individual research grants for students and faculty are mainly supporting the departmental research activities. There is a dire need for increasing the financial resources allocated to the department to establish a library, laboratories and computer facilities. Biochemistry department has recently started a project for establishing a University Institute of Biochemistry and Biotechnology which will be one of the prime national institutions.

Standard 8-2: High Quality Graduate Students and Research Scholars

The M.Sc. and M.Phil students are admitted once in a year. However Ph.D. students may be enrolled in each semester. A strict merit policy is applied for admission coupled with GRE/NTS. A detail of the Students enrolled during the past years is given in the following Table.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>M.Sc.</td>
<td>61</td>
<td>61</td>
<td>59</td>
<td>69</td>
<td>70</td>
<td>70</td>
<td>70</td>
<td>67</td>
<td>71</td>
</tr>
<tr>
<td>M.Phil</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>14</td>
<td>14</td>
<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Ph.D.</td>
<td>8</td>
<td>5</td>
<td>8</td>
<td>5</td>
<td>1</td>
<td>--</td>
<td>3</td>
<td>05</td>
<td>12</td>
</tr>
</tbody>
</table>

Standard 8-3: Financial Resources

Total budget of the department for the financial year 2009-10 is Rs. 57,81325/- which fulfill the departmental needs particularly for the purchase of equipments, chemicals for laboratories and books for the department library.
## ANNEXURE I: DETAILED COURSE CONTENTS OF SCHEME OF STUDIES

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BCH-701</td>
<td>Biochemistry</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>2</td>
<td>BCH-702</td>
<td>Bioinformatics</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>3</td>
<td>BCH-703</td>
<td>Metabolism</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>4</td>
<td>BCH-704</td>
<td>Molecular Biology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>5</td>
<td>BCH-705</td>
<td>Enzymology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>6</td>
<td>BCH-706</td>
<td>Tissue and Cell Culture</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>7</td>
<td>BCH-707</td>
<td>Cellular Signaling Mechanism</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>8</td>
<td>BCH-708</td>
<td>Human Physiology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>9</td>
<td>BCH-709</td>
<td>Biological Methods and Instrumentation</td>
<td>2(0-4)</td>
</tr>
<tr>
<td>10</td>
<td>BCH-710</td>
<td>Protein Chemistry</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>11</td>
<td>BCH-711</td>
<td>Biomembranes</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>12</td>
<td>BCH-712</td>
<td>Genetic Engineering</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>13</td>
<td>BCH-713</td>
<td>Biotechnology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>14</td>
<td>BCH-720</td>
<td>Seminar</td>
<td>1(1-0)</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>Comprehensive Examination</td>
<td>0(0-0)</td>
</tr>
</tbody>
</table>

### Core Courses

In addition to the above courses, the students are required to take compulsory course:

i.) STAT-700 Elements of Statistics and Biometry 3(3-0)

ii.) BIOL-711/BOT-712/ZOOL-711 Research Planning and Report Writing 3(1-4) (This course would be compulsory only for non-thesis students)

iii.) Thesis would be given to students in place of two optional courses and BIOL-711/BOT-712/ZOOL-711 (Research Planning and Report Writing). Thesis would carry weightage of 10 credit hours. The thesis grading will be based on satisfactory/unsatisfactory.

### Minor Courses

In order to fulfill the requirement of minimum of 55 credit hours for the M.Sc. degree in Biochemistry, the students will have to take $\frac{1}{3}$rd of the total courses from other discipline in consultation with Major Supervisor.

### Optional Courses

Remaining credit requirement to be fulfilled by the courses from those offered by the Department for post graduation studies in consultation with major supervisor.
SCHEME OF STUDIES FOR M. Phil. BIOCHEMISTRY
PROGRAMME AT UAAR

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BCH-719</td>
<td>Special Problem</td>
<td>1(1-0)</td>
</tr>
<tr>
<td>2</td>
<td>BCH-720</td>
<td>Seminar-I</td>
<td>1(1-0)</td>
</tr>
<tr>
<td>3</td>
<td>BCH-720</td>
<td>Seminar-II</td>
<td>1(1-0)</td>
</tr>
<tr>
<td>4</td>
<td>BCH-731</td>
<td>Advances in Biochemistry</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>5</td>
<td>BCH-799</td>
<td>Comprehensive Examination</td>
<td>0(0-0)</td>
</tr>
<tr>
<td>6</td>
<td>BCH-799</td>
<td>Thesis</td>
<td>10(----)</td>
</tr>
</tbody>
</table>

Core Courses:

In addition to the above courses, the students are required to take compulsory course:

i.) STAT-700 Elements of Statistics and Biometry 3(3-0)

Minor Courses

In order to fulfill the requirement of minimum of 30 credit hours of course work for the M.Phil. degree in Biochemistry, the students will have to take 1/3rd of the total courses from other discipline in consultation with Major Supervisor.

Optional Courses

Remaining credit requirement to be fulfilled by the courses from those offered by the Department for post-graduate studies in consultation with major supervisor.
### SCHEME OF STUDIES FOR Ph.D. BIOCHEMISTRY

PROGRAMME AT UAAR

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BCH-720</td>
<td>Seminar-I</td>
<td>1(1-0)</td>
</tr>
<tr>
<td>2</td>
<td>BCH-720</td>
<td>Seminar –II</td>
<td>1(1-0)</td>
</tr>
<tr>
<td>3</td>
<td>BCH-751</td>
<td>Advances in Biotechnology</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Comprehensive Examination</td>
<td>0(0-0)</td>
</tr>
<tr>
<td>5</td>
<td>BCH-799</td>
<td>Thesis</td>
<td>50</td>
</tr>
</tbody>
</table>

**Core Courses**

In addition to the above courses, the students are required to take compulsory course:

1. BOT-751    Integrated Agro-biological Resource Management    3(3-0)
2. ZOOL-751   Project Planning, Monitoring and Evaluation        3(3-0)
3. STAT-702   Experimental Design and Computer Application       3(2-2)

### Optional Courses

Remaining credit requirement to be fulfilled by the courses from those offered by the Department for post graduate studies in consultation with major supervisor.
## LIST OF COURSES FOR UNDER-GRADUATES

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BCH-101</td>
<td>General Biochemistry</td>
<td>4(3-2)</td>
</tr>
<tr>
<td>2</td>
<td>BCH-102</td>
<td>Applied Biochemistry</td>
<td>4(3-2)</td>
</tr>
<tr>
<td>3</td>
<td>BCH-201</td>
<td>Molecular Biology</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>4</td>
<td>BCH-302</td>
<td>Introduction to Biochemistry</td>
<td>3(2-2)</td>
</tr>
</tbody>
</table>
THEORY

Introduction

Hydrogen ion concentration, ionic product of water, The relationship between pH and pKa, Buffer solutions, Regulation of acid-base balance, functions of acid-base buffers, The Henderson Hasselbalch equation, The buffer systems of body fluids, Respiratory acids base balance, renal regulation of hydrogen ion concentration, Biomembrane; structure and related process, transport, passive diffusion, facilitated diffusion, Active transport, Carbohydrates; General characteristics, classification, Stereosomerism, Optical isomerism and Optical activity, Cyclic forms of sugars, Glycosidic linkage, Chemical properties, Disaccharides, Poly saccharides, Proteins and amino acids; Structure, Amino acids occurring in protein molecules, Peptide linkage, Physiological significance, Classification, Amphoteric Properties, Isomerism, Structure, Primary secondary and tertiary, enzymes; General characteristics, Chemical nature, difference with non biological catalysts, Activity and unit, Mechanisms of enzyme reaction. Coenzymes, Factors affecting enzyme action, Inhibition, Importance in diagnosis. Lipids; Compound lipids, Derived lipids, fatty acids, Saturated and unsaturated with physical chemical properties. Triglycerides, Properties, Steroids and sterols, Cholesterol, 7-dehydrocholesterol, Ergosterol, Nucleic acids; Chemical composition and structures of DNA and RNA. Functions of DNA and different types of RNA in the cell. Extracellular DNA and plasmids. Central DOGMA and its significance. Introduction to replication, transcription and translation process.

Practical


Books Recommended


THEORY

Comparative biochemistry, Carbohydrate metabolism: Glycolytic pathway, Glycolysis, Tricarboxylic acid cycle, Electron transport chain, Oxidative phosphorylation and formation of ATP, Pentose phosphate shunt, pathway. GI Glucoronic acid pathway, Glucogenesis, Glycogenesis and Gluconeogenesis, Metabolism of Fructose and Galactose, Integration with amino acid metabolism, Protein and amino acid metabolism: Plasma amino acids, synthesis of nonessential amino acids, Fate of amino acids, Urea formation, other pathways of ammonia utilization, Fate of non-nitrogenous residues of amino acids, creatinine and urea formation. Lipids metabolism. The Lipoprotein and their special function in transporting cholesterol and phospholipids. Biosynthesis of fatty acid, Triglycerides, Cholesterol and prostaglandins. Role of adipose tissue in fat metabolism, Metabolism of free fatty acids, Use of triglycerides for energy and formation of ATP, Factors affecting plasma cholesterol concentration. Ketogenesis and utilization of ketone bodies, Ketosis, Metabolism of bile acids and salts. Integration of metabolisms of carbohydrates, Proteins and Fats. Spectroscopy. Fate of carbohydrates, lipids and proteins in monogastric and ruminant animals. Importance of volatile fatty acids in ruminants, Use of agro-industrial wastes for the production of antibiotics, enzymes, hormones, proteins, steroids etc.

PRACTICAL


Books Recommended

THEORY

Chromosome structure and genomic organisation, DNA as a carrier of genetic information, double helical structure of DNA, forces stabilising nucleic acid structures, supercoiled DNA, DNA replication general aspects and enzymes involved, prokaryotic and eukaryotic replication, mechanisms, repair of DNA, RNA, polymerase and transcription, post transcriptional processing, splicing, regulation of transcription in prokaryotes, genetic code, structure of transfer RNA, ribosome structure, translation mechanism, inhibitors of protein synthesis, post-translational modifications, nucleic acid fractionation and sequencing, chemical synthesis of oligonucleotides, DNA cloning technology. Vectors, hosts, enzymes involved in cloning Genomic and cDNA libraries, PCR and its use in forensics. Molecular Biology in veterinary medicine.

Books Recommended


Books Recommended


Practical

Preparation of laboratory solutions and pH determination. Estimation of sugars from different biological samples, differentiation of sugars like, monosaccharide and disaccharides, reducing and non-reducing sugars. Extraction and detection of proteins. Fat extraction from plant material by using soxhlet methods. Determination of moisture in plant samples Determination of vitamin C or ascorbic acid from citrus fruit. Determination of nucleic acids.

Books Recommended

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BCH-701</td>
<td>Biochemistry</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>2</td>
<td>BCH-702</td>
<td>Bioinformatics</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>3</td>
<td>BCH-703</td>
<td>Metabolism</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>4</td>
<td>BCH-704</td>
<td>Molecular Biology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>5</td>
<td>BCH-705</td>
<td>Enzymology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>6</td>
<td>BCH-706</td>
<td>Tissue and Cell Culture</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>7</td>
<td>BCH-707</td>
<td>Cellular Signaling Mechanism</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>8</td>
<td>BCH-708</td>
<td>Human Physiology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>9</td>
<td>BCH-709</td>
<td>Biological Methods and Instrumentation</td>
<td>2(0-4)</td>
</tr>
<tr>
<td>10</td>
<td>BCH-710</td>
<td>Protein Chemistry</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>11</td>
<td>BCH-711</td>
<td>Biomembranes</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>12</td>
<td>BCH-712</td>
<td>Genetic Engineering</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>13</td>
<td>BCH-713</td>
<td>Biotechnology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>14</td>
<td>BCH-714</td>
<td>Clinical Biochemistry</td>
<td>3(1-4)</td>
</tr>
<tr>
<td>15</td>
<td>BCH-715</td>
<td>Medical Microbiology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>16</td>
<td>BCH-716</td>
<td>Nutrition and Dietetics</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>17</td>
<td>BCH-718</td>
<td>Plant Biochemistry</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>18</td>
<td>BCH-719</td>
<td>Special Problem</td>
<td>1(1-0)</td>
</tr>
<tr>
<td>19</td>
<td>BCH-720</td>
<td>Seminar-I</td>
<td>1(1-0)</td>
</tr>
<tr>
<td>20</td>
<td>BCH-720</td>
<td>Seminar-II</td>
<td>1(1-0)</td>
</tr>
<tr>
<td>21</td>
<td>BCH-721</td>
<td>Environmental Biochemistry</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>22</td>
<td>BCH-722</td>
<td>Recent Topics in Molecular Biology</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>23</td>
<td>BCH-723</td>
<td>Current Topics in Microbiology</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>24</td>
<td>BCH-724</td>
<td>Fundamentals of Biotechnology</td>
<td>4(3-2)</td>
</tr>
<tr>
<td>25</td>
<td>BCH-725</td>
<td>Trends in Immunology</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>26</td>
<td>BCH-726</td>
<td>Advanced Biochemistry</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>27</td>
<td>BCH-727</td>
<td>General Microbiology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>28</td>
<td>BCH-728</td>
<td>Immunology and Immunochemistry</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>29</td>
<td>BCH-731</td>
<td>Advances in Biochemistry</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>30</td>
<td>BCH-732</td>
<td>Medical Nutrition Therapy</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>31</td>
<td>BCH-733</td>
<td>Plant Molecular Physiology</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>32</td>
<td>BCH-734</td>
<td>Numerical Problems in Biochemistry</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>33</td>
<td>BCH-735</td>
<td>Principles of Advanced Biochemical Techniques</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>34</td>
<td>BCH-736</td>
<td>Proteomics</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>35</td>
<td>BCH-737</td>
<td>Nanobiotechnology</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>36</td>
<td>BCH-751</td>
<td>Advances in Biotechnology</td>
<td>3(3-0)</td>
</tr>
</tbody>
</table>
Theory

Practical
Titration curves, pKa determination, buffer preparation, amino acid and proteins determination, protein precipitations, carbohydrate and lipid determination. Sugar identification using paper chromatography, amino acid separation by two dimensional paper chromatography, steroid separation by thin layer chromatography (TLC).

Books Recommended

Pre-requisite BCH-702 (Molecular Biology)

Theory

Practical:
Introduction to Computers, DNA sequence manipulation tools, Codon usage analysis, Restriction digestion and analysis, Primer designing and primer analysis, ORF finding and Gene prediction in prokaryotes and eukaryotes. Homology searches, Global and local alignment using CLUSTAL and BLAST programs, Phylogenetic analysis.

Recommended Books

### Theory


### Practical

Analysis of milk, egg, meat, wheat flour, bread, potato and blood for amino acids, peptides, enzymes, lipids, nucleic acids and carbohydrates. Determination of vitamin A, carotenes, riboflavin, ascorbic acid (vitamin C). Techniques include a variety of chromatographic methods, electrophoresis, UV/Visible spectroscopy.

### Book Recommended:


### Molecular Biology


### Practical

Laboratory ethics. Spectrophotometry; Quantification of nucleic acids, Melting kinetics of DNA, Protein estimation by Lowry and Bradford methods. Protein separation by SDS-PAGE. Centrifugation; Density gradient centrifugation. Column and thin layer chromatography.

### Books Recommended:

### BCH-705  
**Enzymology**  
| 3(2-2) |

**Theory**


**Practical**


**Books Recommended**


### BCH-706  
**Tissue and Cell Culture**  
| 3(2-2) |

**Theory**

Introduction, laboratory safety, culture environment, cell lines, media/components, cell culture theory, tissue types, genetic engineering of cultured animal and plant cells, selection strategies, virus elimination, micro-propagation, somaclonal variations, haploid culture, embryo rescue, protoplast culture and somatic hybridization, protoplast culture.

**Practical**

Aseptic technique, microscopy, screening for contamination, freezing cells, media preparations, growth cycle, histology, DNA transfection, selection and analysis of transformed cells, tobacco anther culture, fern micro-propagation, protoplast isolation.

**Books Recommended:**


### BCH-707  
**Cellular Signaling Mechanism**  
| 3(3-0) |

**Theory:**

This course both basic and state-of-art knowledge in: I. Biosynthetic and secretion of steroids, peptides and other hormones, II. Modes and mechanisms of hormone action at the cellular and molecular levels with specific emphasis on receptor structure/function, receptor action and signal transduction mechanism that operates at the nuclear and cell surface levels and in normal and cancerous cells.
Books Recommended:

12. Recent review papers.

<table>
<thead>
<tr>
<th>BCH-708</th>
<th>Human Physiology</th>
<th>3(2-2)</th>
</tr>
</thead>
</table>

Theory


Practical


Books Recommended


<table>
<thead>
<tr>
<th>BCH-709</th>
<th>Biological Methods and Instrumentations</th>
<th>2(0-4)</th>
</tr>
</thead>
</table>

Practical

Students will get knowledge of theoretical and practical uses of various equipments required for analysis of sugars, proteins and fatty acids, and similar other compounds. Ultracentrifuge, various type of chromatography’s , paper, thin layer, liquid-liquid and affinity chromatography. High performance liquid chromatography and gas chromatography, GC-MS, LC–MS etc. Nuclear magnetic resonance; visible, ultraviolet, and luminescence, spectrometry. Flame atomic absorption, spectroscopy, Fluorescence and emission spectroscopy, X-ray diffraction.

Books recommended

Theory

Books Recommended

 Theory

 Practical
Growth of bacteria on solid medium, preparation of bacterial culture, preparation of plasmid DNA, restriction enzyme digestion of DNA preparation, separation and identification of DNA fragment by agarose gel electrophoresis, purification of DNA fragment by electroporation after digestion and separation on agarose, PCR, sequencing, DNA extraction, preparation of probe for DNA fragment analysis, Southern blot and hybridization, RNA extraction and determination, RNA electrophoresis, probe preparation for RNA analysis, Northern blot.

 Books Recommended
6. Recent review papers.

 Theory

 Practical
Production of monoclonal antibodies and its use in immunological diagnosis. DNA diagnosis using PCR. Study tours to various biotechnological laboratories.

 Books Recommended
8. Recent review papers.

 Theory

Practical
The clinical biochemistry laboratory: Good laboratory practices. The role of laboratory in collection, handling and processing of specimens/biological samples. Instrumentation in clinical laboratory. SOPs of laboratory instruments. Laboratory calculations, SI and conventional units, requesting and interpreting results. Point of care testing. Blood Chemistry. Urine Chemistry. Liver function tests. Renal function related tests. Gastrointestinal tract related tests.

Books Recommended

BCH-715 Medical Microbiology 3(2-2)

Theory

Practical

Books Recommended

BCH-716 Nutrition and Dietetics 3(2-2)
Theory

Practical

Books Recommended

Pre-requisite: BCH-701
Theory

Books Recommended
Theory


Hydrosphere: Biological aspects of surface water pollution, industrial waste water, sewage and other solid wastes in water. Biochemical effect of acid rains. Thermal pollution, radioactive wastes in water and their effect on plants and animals.


Practical

Analysis of heavy metals from body fluids (blood and urine) and from environment (air, water & food) by atomic absorption. Analysis of pesticides residual for food/plants by chromatographic techniques. Water Microbiology, isolation and characterization of microorganisms from various environments (urban and rural), preparation of media to characterize for environmental safety, selective media for bacteria and fungi and staining of microorganisms, determination of level of environmentally applied chemicals on various eatable products like vegetables and fruits. Ames test, determination of carcinogenic material in vegetables and fruits particularly, Nitrates (NO3), Nitrite (NO2) and Nitrosamine.

Books Recommended


Books/Literature Recommended

12. Recent papers/review papers.
Theory

A study of modern molecular genetics as revealed by studies of microbial systems. This course covers current advancement in major groups of bacteria, fungi, protozoa and yeast and their use in gene manipulation to obtain a specific goal related to agriculture, health and medicine. Recent papers will be discussed and students will be asked to present seminar on topics mentioned above.

Books/Literature Recommended

9. Recent papers/review papers.

Books/Literature Recommended


Books/Literature Recommended

2. Abul K. Abbas & Andrew Lichtman. (February 1, 2006) Basic Immunology, Publisher: Saunders; 2nd edition
18. Recent papers/review papers.

BCH-726

Advanced Biochemistry

3(3-0)

Theory

Advanced level discussion of the application of biochemical principles to complex biological problems. Topics include structural and conformational properties of macromolecules with emphasis on macromolecular function and recognition, mechanism of enzymatic reactions, sensory adaptation and the biochemistry of transcription.

Books/Literature Recommended
6. Recent papers/review papers.

BCH-727

General Microbiology

3(2-2)

Theory


Practical


Books Recommended
Theory

Introduction to the immune system. Elements of innate & acquired immunity, immunogens and antigens. Antibody structure and function, antigen-antibody interactions, genetic basis of antibody structure. Biology of the B lymphocyte, the role of MHC in the immune system, biology of the T lymphocyte, activation and function of T and B cells, Control mechanisms in immune response, cytokines, complement, hypersensitivity reactions; type I, II, III, IV. Autoimmunity, immunodeficiency and other disorders of the immune system, transplantation immunology, tumor immunology, resistance and immunization to infectious diseases. Practical application of immunological function.

Practical


Books Recommended


Advanced level course will cover all recent advances in Biochemistry including genomes, proteomics etc.

Books Recommended


Theory

Nutritional Genomics: Disease at the chromosomal level, Disease at the Molecular level, Disease at the Mitochondrial level, Genetic and nutrition therapy, influences of gene-nutrient, Interaction on metabolic process. Interactions on gene expression, complex genetic nutrition connections. Nutrition therapy for Acid-Base disorder. Nutrition therapy in Aging, Theories of Ageing, physiologic changes, Body composition changes, sensory losses, oral health status, Gastrointestinal function, Cardiovascular function, Renal function, neurologic function, immunocompetence, medications, Nutrition needs and nutrition issues.

Books Recommended:


Books Recommended:

Numerical Problems in Biochemistry

Books Recommended:

**BCH-735**  
Principles of Advanced Biochemical Technique  
3(3-0)

GC-MS, LC-MS, their principles, theory, sampling techniques, instrumentation and recent developments. Capillary electrophoresis and its applications. FT-IR, principle, instrumentation, sampling techniques and applications. MALDI Toff (Matrix Assisted Laser Desorprion Ionization Time of Flight), Quadrupole mass spectrometry (QMS), Tandem Mass Spectrometry (MS/MS). Flow cytometer principle, technique and applications. Real Time PCR, development, advantage, how it quantitate DNA or cDNA, Quantitation of mRNA levels, analysis and applications. Inductively coupled plasma emission spectroscopy (ICPMS)

**Books Recommended:**


**BCH -736**  
Proteomics  
3(3-0)

Theory

**Books Recommended:**

Theory


Books Recommended


THEORY

Address advanced topics in microbial, animal and plant biotechnology such as biosensors, gene chip, gene silencing, immobilised biocatalysts. Gene therapy. Plants as bioreactors, tissue culture and transgenic plants. Bioremediations and biomass utilisations. Computer based modeling and drug designing.

BOOKS RECOMMENDED

4. Recent papers/review papers.
Summary

This Self Assessment Report (SAR) contains eight sections. The first section outlines the program mission and objectives. Section-2 provides information about the curriculum development. Section-3 enlists the laboratories and other relevant information. The last four sections provide information about student support, process control, faculty characteristics and institutional facilities and support provided by the university.

The program mission, objectives and outcomes are assessed and strategic plans are presented to achieve the goal, which are again measurable through definite standards. Programme outcomes appeared to be highly relevant. The results of proforma no. 10 of 2009 show the scores of evaluation by students; five teachers of the Department of Biochemistry which ranged from 3.1 to 3.65 on a scale of 3.70%. The results of proforma no. 1 of 2009 show the score evaluation by the students, of five courses offered by the Department of Biochemistry which ranged from 2.60 to 3.40 on a scale of 3.50%.

The results of proforma no. 10 of 2010 show the scores of evaluation by students; five teachers of the Department of Biochemistry which ranged from 2.5 to 3.65 on a scale of 3.70%. The results of proforma no. 1 of 2010 show the score evaluation by the students, of five courses offered by the Department of Biochemistry which ranged from 2.60 to 3.49 on a scale of 3.50%.

The curriculum satisfies the core requirements for the programmes as specified by HEC and Information Technology components of the curriculum has been applied by offering non-conventional course like Experimental Design and Computer Applications, Bioinformatics and Proteomics.

Curriculum design and update is initiated by the faculty members of the Department after the approval of Board of Studies which is comprised of senior faculty members and a subject specialist who is taken from other faculties or from other Universities or research institutions. The Board is headed by the Chairman of the Department. The approved curriculum is then sent to Board of Faculty, headed by the Dean Faculty of Sciences. This Board consists of senior faculty members from all the Departments of the faculty and subject specialists. Finally the curriculum is presented to the University Syndicate for formal approval after the approval of the Academic Council which is comprised of the Professors, Associate Professors, Faculty Representatives of whole the university and very senior subject specialists from other academic/research institution.

Laboratories are reasonably equipped but not spacious and adequate. However these problems will be circumvented in the near future when the Department will shift to its new building.

The process of admission is well established and followed as per rules and criteria set by HEC and the University. For this purpose an advertisement is published in the National News Papers by the Registrar Office. As regards the process control covering admission, registration, recruiting policy, courses and delivery of material, academic requirements, performance and grading, university as well as Higher Education Commission have set forth appropriate rules, which are properly followed.

Institutional facilities were measured through Criterion 3; infrastructure and facilities, class rooms, faculty offices, computing facility support, short comings in computing infrastructure and safety arrangements are highlighted. Institutional facilities need to be strengthened.
CONCLUSION

The performance of the Department may be improved considering the following points.

1. Developing of human resource for the highly advanced fields of biochemistry, biotechnology, enzymology and bioinformatics to play a crucial role in national development.

2. Strengthening graduate, post graduate and postdoctoral programmes in Biochemistry, Biotechnology and Bioinformatics.

3. Up-gradation of research by integrating biochemistry, biotechnology and bioinformatics into existing traditional systems.

4. To emphasize biochemical and molecular approaches in vitro techniques in plant propagation, crop improvement and plant disease management as well as animal disease management.

5. Strengthening capabilities in cloning animal, plant, viral and bacterial genes to be utilized in various ways.

6. Introduction of genetic engineering of crops as a regular feature for crop improvement.

7. Production of recombinant proteins, enzymes, hormones, antibiotics or vaccines etc for therapeutic use/diagnostic purposes for human, plants, animals and different industries.

8. Development of efficient microbes for treatment of waste and other hazardous materials and to take care of environmental pollution.

9. The faculty survey revealed that some faculty members are in need of professional foreign training which will enable them to carry out research on the latest issues.

10. At present there are no arrangements for professional and behavioral training of the supporting staff. Such trainings will improve their abilities for assisting in enhancing the quality of research and teaching.

11. The survey has also pointed out that computer with internet facilities should be available to all faculty members and post graduate students to boost the level of research and teaching.

12. Faculty members have pointed out that the weakest aspect is the amount of time available to teachers to interact with their families.
# Proforma 2

## Faculty Course Review Report
*(To be filled by each teacher at the time of Course Completion)*

For completion by the course instructor and transmission to Head of Department of his/her nominee (Dept. Quality Officer) together with copies of the Course Syllabus outline.

<table>
<thead>
<tr>
<th>Department:</th>
<th>Faculty:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>Title:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Session:</th>
<th>Semester:</th>
<th>Autumn</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Credit Value:</th>
<th>Level:</th>
<th>Prerequisites:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Name of Course Instructor:</th>
<th>No. of Students</th>
<th>Contact Hours</th>
<th>Lectures</th>
<th>Other (Please State)</th>
<th>Seminars</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Assessment Methods:</th>
<th>give precise details (no &amp; length of assignments, exams, weightings etc)</th>
</tr>
</thead>
</table>

## Distribution of Grade/Marks and other Outcomes: (adopt the grading system as required)

<table>
<thead>
<tr>
<th>Undergraduate</th>
<th>Originally Registered</th>
<th>%Grade A</th>
<th>%Grade B</th>
<th>%Grade C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>No Grade</th>
<th>Withdrawal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post-Graduate</th>
<th>Originally Registered</th>
<th>%Grade A</th>
<th>%Grade B</th>
<th>%Grade C</th>
<th>D</th>
<th>E</th>
<th>No Grade</th>
<th>Withdrawal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Overview/Evaluation (Course Co-coordinator’s Comments)

Feedback: first summarize, then comment on feedback received from:
*(These boxes will expand as you type in your answer.)*

1) Student (Course Evaluation) Questionnaires

2) External Examiners or Moderators (if any)

3) Student /staff Consultative Committee (SSCC) or equivalent, (if any)

4) Curriculum: comment on the continuing appropriateness of the Course curriculum in relation to the intended learning outcomes (course objectives) and its compliance with the HEC Approved / Revised National Curriculum Guidelines
5) Assessment: comment on the continuing effectiveness of method(s) of assessment in relation to the intended learning outcomes (Course objectives)

6) Enhancement: comment on the implementation of changes proposed in earlier Faculty Course Review Reports

7) Outline any changes in the future delivery or structure of the Course that this semester/term’s experience may prompt

Name: __________________________________ Date: ____________________
(Course Instructor)

Name: __________________________________ Date: ____________________
(Head of Department)
Survey of Graduating Students

(To be filled out by graduating students in last semester/year before the award of degree)

The survey seeks graduating students' input on the quality of education they received in their program and the level of preparation they had at university. The purpose of this survey is to assess the quality of the academic programs. We seek your help in completing this survey.

A: Very satisfied   B: Satisfied   C: Uncertain   D: Dissatisfied   E: Very dissatisfied

1. The work in the program is too heavy and induces a lot of pressure
   A    B    C    D    E

2. The program is effective in enhancing team-working abilities.
   A    B    C    D    E

3. The program administration is effective in supporting learning.
   A    B    C    D    E

4. The program is effective in developing analytical and problem solving skills.
   A    B    C    D    E

5. The program is effective in developing independent thinking.
   A    B    C    D    E

6. The program is effective in developing written communication skills.
   A    B    C    D    E

7. The program is effective in developing planning abilities.
   A    B    C    D    E

8. The objectives of the program have been fully achieved
   A    B    C    D    E

9. Whether the contents of curriculum are advanced and meet program objectives
   A    B    C    D    E

10. Faculty was able to meet the program objectives
11. Environment was conducive for learning

12. Whether the Infrastructure of the department was good.

13. Whether the program was comprised of Co-curricular and extra-curricular activities

14. Whether scholarships/ grants were available to students in case of hardship

Answer question 9 if applicable.

9. The internship experience is effective in enhancing
   a. Ability to work in teams (A) (B) (C) (D) (E)
   b. Independent thinking (A) (B) (C) (D) (E)
   c. Appreciation of ethical Values (A) (B) (C) (D) (E)
   d. Professional development (A) (B) (C) (D) (E)
   e. Time management skills (A) (B) (C) (D) (E)
   f. Judgment (A) (B) (C) (D) (E)
   g. Discipline (A) (B) (C) (D) (E)
   h. The link between theory and practice (A) (B) (C) (D) (E)

10. What are the best aspects of your program?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

11. What aspects of your program could be improved?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

You may use additional sheets for questions 10 & 11 if needed.
# RESEARCH STUDENT PROGRESS REVIEW FORM

(To be filled out by Master/M.Phil/Ph.D Research Students on six monthly basis)

To be submitted by the HoD/Dept. Quality Officer to the QEC

## For Research Student to Complete:

1. Date of admission to the department
2. Date of initiation of research
3. Date of completion of Course work
4. Number of credit hours completed
5. Date of Synopsis Defense
6. Cumulative Grade Point Average (CGPA) secured
7. Please outline details of progress in your research since your last review (including any research publications):

8. Do you have any comments on the level of supervision received?

9. What do you plan to achieve over the next 6 months?

10. Do you have any comments on generic or subject-specialist training you may have received or would like to receive internally and/or externally?

11. Do you have easy access to sophisticated scientific equipment?

12. Do you have sufficient research material/commodities available?

<table>
<thead>
<tr>
<th>Student __________________________</th>
<th>Date: ______________</th>
</tr>
</thead>
</table>

## Supervisory Committee Comments

(Please comment on and benchmark the student’s progress against your University’s internal and external HEC Quality Criteria for Master/PhD/MPhil Studies)

<table>
<thead>
<tr>
<th>Principal Supervisor: ______________</th>
<th>Date: ______________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-Supervisor: ______________</td>
<td>Date: ______________</td>
</tr>
<tr>
<td>Co-Supervisor: ______________</td>
<td>Date: ______________</td>
</tr>
</tbody>
</table>

## Head of Department Comments:

<table>
<thead>
<tr>
<th>Signature: ______________</th>
<th>Date: ______________</th>
</tr>
</thead>
</table>

## Director, Board of Research Studies (or equivalent) Comments:

<table>
<thead>
<tr>
<th>Signature: ______________</th>
<th>Date: ______________</th>
</tr>
</thead>
</table>

## Dean/Director, QEC Action: (including monitoring of Follow-up action) Date: __________
Proforma 5

Faculty Survey

*(To be submitted on annual basis by each faculty member)*

The Purpose of this survey is to assess faculty members’ satisfaction level and the effectiveness of programs in place to help them progress and excel in their profession. We seek your help in completing this survey and the information provided will be kept in confidence. **Indicate how satisfied are you with each of the following aspects of you situation at your department?**


1. Your mix of research, teaching and community service.
   
   A B C D E

2. The intellectual stimulation of your work.
   
   A B C D E

3. Type of teaching / research you currently do.
   
   A B C D E

4. Your interaction with students.
   
   A B C D E

5. Cooperation you receive from colleagues.
   
   A B C D E

6. The mentoring available to you.
   
   A B C D E

7. Administrative support from the department.
   
   A B C D E

8. Providing clarity about the faculty promotion process.
   
   A B C D E

9. Your prospects for advancement and progress through ranks.
   
   A B C D E

10. Salary and compensation package.
    
    A B C D E
11. Job security and stability at the department.
   A  B  C  D  E

12. Amount of time you have for yourself and family.
   A  B  C  D  E

13. The overall climate at the department.
   A  B  C  D  E

14. Whether the department is utilizing your experience and knowledge
   A  B  C  D  E

15. What are the best programs / factors currently available in your department that enhance your
   motivation and job satisfaction:
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

16. Suggest programs / factors that could improve your motivation and job satisfaction?
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

Information about faculty member

i. Academic rank:
   A: Professor   B: Associate Professor   C: Assistant Professor   D: Lecturer
   E: Other

ii. Years of service:
   A: 1-5   B: 6-10   C: 11-15   D: 16-20   E: >20

Name: __________________ Signature: ___________________ Date: ______________
## Proforma 6

### SURVEY OF DEPARTMENT OFFERING Ph.D. PROGRAMS

The following information is required for EACH Department in which a Ph.D. program is offered.

<table>
<thead>
<tr>
<th></th>
<th>General Information:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name of Department</td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Name of Faculty</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>Date of initiation of Ph.D. program</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>Total number of academic journals subscribed in area relevant to Ph.D. program</td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>Number of Computers available per Ph.D. student</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>Total Internet Bandwidth available to all the students in the Department.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Faculty Resources:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Number of faculty members holding Ph.D. degree in the department.</td>
</tr>
<tr>
<td>2.1</td>
<td>Number of HEC approved Ph.D. Advisors in the department.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Research Output:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Total number of articles published last year in International Academic Journals that are authored by faculty members and students in the department.</td>
</tr>
<tr>
<td>3.1</td>
<td>Total number of articles published last year in Asian Academic Journals that are authored by faculty members and students in the department.</td>
</tr>
<tr>
<td>3.2</td>
<td>Total number of ongoing research projects in the department funded by different organizations</td>
</tr>
<tr>
<td>3.3</td>
<td>Number of post-graduate students in the department holding scholarships/fellowships.</td>
</tr>
<tr>
<td>3.4</td>
<td>Total Research Funds available to the Department from all sources.</td>
</tr>
<tr>
<td>3.5</td>
<td>Number of active international linkages involving exchange of researchers/students/faculty etc. (Attach Details).</td>
</tr>
<tr>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Student Information:</td>
</tr>
<tr>
<td>---</td>
<td>----------------------</td>
</tr>
<tr>
<td>4.1</td>
<td>Number of Ph.D. degrees conferred to date to students from the Department during the past three academic years.</td>
</tr>
<tr>
<td>4.2</td>
<td>Number of Ph.D. students currently enrolled in the department.</td>
</tr>
<tr>
<td>4.3</td>
<td>Ratio of number of students accepted to total number of applicants for Ph.D. Program.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5</th>
<th>Program Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Entrance requirements into Ph.D. Program (M.Sc. / M.Phil.) Indicate subjects or M.Sc. / M.Phil.</td>
</tr>
<tr>
<td>5.2</td>
<td>Is your Ph.D. program based on research only? (Y/N)</td>
</tr>
<tr>
<td>5.3</td>
<td>Maximum number of years in which a Ph.D. degree has to be completed after initial date of enrollment in Ph.D. program.</td>
</tr>
<tr>
<td>5.4</td>
<td>Total number of post M.Sc. (16 year equivalent) courses required for Ph.D.</td>
</tr>
<tr>
<td>5.5</td>
<td>Total number of M.Phil. level courses taught on average in a Term / Semester.</td>
</tr>
<tr>
<td>5.6</td>
<td>Total number of Ph.D. level courses taught on average in a Term / Semester.</td>
</tr>
<tr>
<td>5.7</td>
<td>Do your students have to take/write:</td>
</tr>
<tr>
<td></td>
<td>e. Ph.D. Qualifying examination (Y/N)</td>
</tr>
<tr>
<td></td>
<td>f. Comprehensive examination (Y/N)</td>
</tr>
<tr>
<td></td>
<td>g. Research paper in HEC approved Journal</td>
</tr>
<tr>
<td></td>
<td>h. Any other examination (Y/N)</td>
</tr>
<tr>
<td>5.8</td>
<td>Total number of International examiners to which the Ph.D. dissertation is sent.</td>
</tr>
<tr>
<td>5.9</td>
<td>How is the selection of an examiner from technologically advanced countries carried out?</td>
</tr>
<tr>
<td>5.10</td>
<td>Is there a minimum residency requirement (on campus) for award of Ph.D. degree?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Any other information that you would like to provide.</td>
</tr>
</tbody>
</table>
The purpose of this survey is to obtain alumni input on the quality of education they received and the level of preparation they had at University. The purpose of this survey is to assess the quality of the academic program. We seek your help in completing this survey.

<table>
<thead>
<tr>
<th>A: Excellent</th>
<th>B: Very good</th>
<th>C: Good</th>
<th>D: Fair</th>
<th>E: Poor</th>
</tr>
</thead>
</table>

### 1. Knowledge
1. Math, Science, Humanities and professional discipline, (if applicable)  
2. Problem formulation and solving skills  
3. Collecting and analyzing appropriate data  
4. Ability to link theory to practice.  
5. Ability to design a system component or process  
6. IT knowledge

### II Communications Skills
1. Oral communication  
2. Report writing  
3. Presentation skills

### III Interpersonal Skills
1. Ability to work in teams.  
2. Ability to work in arduous /Challenging situation  
3. Independent thinking  
4. Appreciation of ethical Values

### IV Management /leadership Skills
1. Resource and Time management skills  
2. Judgment  
3. Discipline

### V General Comments
Please make any additional comments or suggestions, which you think would help strengthen our programs. (New courses that you would recommend and courses that you did not gain much from)

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

### VI. Career Opportunities

### VII. Department Status
1. Infrastructure  
2. Faculty  
3. Repute at National level  
4. Repute at international level
VIII Alumni Information

1. Name (Optional)______________________________
2. Name of organization_____________________________________
3. Position in organization_____________________________________
4. Year of graduation_________________________________________
Employer Survey

(To be filled in by Employer - after the completion of each academic year)

The purpose of this survey is to obtain employers’ input on the quality of education University of Arid Agriculture, Rawalpindi is providing and to assess the quality of the academic program. The survey is with regard to University of ________ graduates employed at your organization. We seek your help in completing this survey.

A: Excellent  B: Very good  C: Good  D: Fair  E: Poor

I. Knowledge.
1. Math, Science, Humanities and professional discipline, (if applicable)
   (A) (B) (C) (D) (E)
2. Problem formulation and solving skills
   (A) (B) (C) (D) (E)
3. Collecting and analyzing appropriate data
   (A) (B) (C) (D) (E)
4. Ability to link theory to Practice
   (A) (B) (C) (D) (E)
5. Ability to design a system component or process
   (A) (B) (C) (D) (E)
6. Computer knowledge.
   (A) (B) (C) (D) (E)

II. Communication Skills
1. Oral communication
   (A) (B) (C) (D) (E)
2. Report writing
   (A) (B) (C) (D) (E)
3. Presentation skills
   (A) (B) (C) (D) (E)

III. Interpersonal Skills
1. Ability to work in teams
   (A) (B) (C) (D) (E)
2. Leadership
   (A) (B) (C) (D) (E)
3. Independent thinking
   (A) (B) (C) (D) (E)
4. Motivation
   (A) (B) (C) (D) (E)
5. Reliability
   (A) (B) (C) (D) (E)
6. Appreciation of ethical values
   (A) (B) (C) (D) (E)

IV. Work skills
1. Time management skills
   (A) (B) (C) (D) (E)
2. Judgment
   (A) (B) (C) (D) (E)
3. Discipline
   (A) (B) (C) (D) (E)

V. General Comments
Please make any additional comments or suggestions, which you think would help strengthen our programs for the preparation of graduates who will enter your field. Did you know as to what to expect from graduates?

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

VI. Information About Organization

1. Organization Name________________________________________________

2. Type of Business__________________________________________________

3. Number of Graduates (specify the program) in your Organization:
## Faculty Resume

<table>
<thead>
<tr>
<th>Name</th>
<th></th>
</tr>
</thead>
</table>

### Personal

**May include address(s) and phone number(s) and other personal information that the candidate feels is pertinent.**

### Experience

List current appointment first, each entry as follows:

*Date, Title, Institution.*

### Honor and Awards

List honors or awards for scholarship or professional activity.

### Memberships

List memberships in professional and learned Societies, indicating offices held, committees, or other specific assignments.

### Graduate Students

**List supervision of graduate students, postdocs and undergraduate honors theses showing:**

<table>
<thead>
<tr>
<th>Years</th>
<th>Degree</th>
<th>Name</th>
</tr>
</thead>
</table>

Show other information as appropriate and list membership on graduate degree committees.

### Undergraduate Students

### Honour Students

### Service Activity

List University and public service activities.

### Brief Statement of Research Interest

*May be as brief as a sentence or contain additional details up to one page in length.*
### Publications

List publications in standard bibliographic format with earliest date first.

- Manuscripts accepted for publication should be included under appropriate category as “in press;”
- Segment the list under the following standard headings:
  - Articles published by refereed journals.
  - Books.
  - Scholarly and / or creative activity published through a refereed electronic venue.
  - Contribution to edited volumes.
  - Papers published in refereed conference proceedings.
  - Paper or extended abstracts published in conference proceedings, (refereed on the basis of abstract)
  - Articles published in popular press.
  - Articles appearing in in-house organs.
  - Research reports submitted to sponsors.
  - Articles published in non-refereed journals.
  - Manuscripts submitted for publication. (include where and when submitted).

### Research Grants and Contracts

Entries should include:

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Agency / Organization</th>
<th>Total Award Amount</th>
</tr>
</thead>
</table>

Segment the list under following headings:

- Completed
- Funded and in progress
- In review

### Other Research or Creative Accomplishments

List patents, software, new products developed, etc.

### Selected Professional Presentations