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ARID AGRICULTURE UNIVERSITY
RAWALPINDI**

DEPARTMENT OF ZOOLOGY/BIOLOGY

(Ph.D. Programme)



Self Assessment Report

7th Cycle (2018-20)

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1. INTRODUCTION

The Department of Zoology/Biology is offering PhD degree program since 2001. The PhD degree comprises a minimum of three years of full-time study, a year of course work and two years research with an individual supervisor. The evaluation of PhD students involves midterm exam, final exam, comprehensive exam and open research defenses. Presently, a total of nine permanent faculty members including a professor, two associate professors, five assistant professors, and a lecturer are working at the department. The academic staff of the Department of Zoology/Biology is highly qualified and trained in the field of Zoology. PhD scholars are encouraged to work on conventional as well as applied aspects that are at the cutting edge of new research and policy initiatives.

Presently, major research groups are Parasitology/Microbiology, Reproductive Physiology/Endocrinology, Genetics, Aquaculture and Fisheries and Wildlife/Ecology. The research groups have national and international research collaborations with researchers at prestigious organizations such as National Agriculture Research Council (NARC), Punjab Fish Hatcheries Islamabad, National Institute of Health (NIH), and for clinical exploration different healing centers of Rawalpindi and Islamabad, for example, General Hospital Rawalpindi and National Oncology Radiology Institute (NORI) and Institute of Biomedical and Genetic Engineering (IBGE), Islamabad. The Department also has collaborated with distinctive global institutions. Faculty members have won various research projects and travelling grants from Higher Education Commission (HEC), Pakistan and Pakistan Science Foundation (PSF). The PhD students have been visiting world's top research laboratories under the International Research Support Initiative Program (IRSIP) offered by HEC, Pakistan.

SECTION 1

CRITERION-1: PROGRAM MISSION, OBJECTIVES AND OUTCOMES

Zoology is the study of animal biology in all its aspects, from cells to populations and from neurones to behaviour. The program intends to create profoundly qualified Zoologists in Parasitology/Microbiology, Reproductive Physiology/Endocrinology, Aquaculture and Fisheries, and Wildlife/Ecology keeping in view the interest of the graduating students and real time problems.

Mission Statement

The project advances discoveries and learning of biology and zoology. We focus on the development of disciplinary and interdisciplinary research and education strategies and methodologies.

STANDARDS:

Standard 1-1: Documented measurable objectives

Objectives:

1. A particular exploration theme in Parasitology and Microbiology, Reproductive Physiology and Endocrinology, Aquaculture and Fisheries and Wildlife and Ecology
2. Learn the research design, methodologies, and execution of the project
3. Ability to compose the reports, and present and defend the results in an open forum.

Outcomes:

- 1) The graduating students are represented considerable authority in the subject.
- 2) The graduates have the capacity to make and execute new research extends freely.
- 3) Graduates are confident to present their research papers at international and national meetings.

Main elements to achieve objectives

Research

- 1) Keep up significant exploration dimensions and pave paths to achieve excellence in the applied fields of biological sciences from molecular to the population level.
- 2) Support integrated research on all the dimensions
- 3) Promote basic and applied research in laboratory and field
- 4) Strengthen the basis of teaching and service of advanced disciplines of biology.

Teaching

1. Impart practical knowledge and experience in biological sciences
2. Maintain a thorough, wide based real in organic sciences that gives a convincing learning background.
3. In order to adjust tin evolving world, promote universally useful critical thinking and logical capacities that have wide applications.
4. Stress the basic concepts of biological sciences leading to integration.
5. Prepare extraordinary graduate resulting in interdisciplinary correspondence.

TABLE-1: OBJECTIVES ASSESSMENT

S. #	Objective	How Measured	When Measured	Improvement Identified	Improvement made
1	A particular exploration theme in Parasitology and Microbiology, Reproductive Physiology and Endocrinology, Aquaculture and Fisheries and Wildlife and Ecology	Viva Voce, semester examination and comprehensive examination	While entry into the program, end of semester and course work	Curriculum update and faculty training	Specific optional courses are offered to increases knowledge of a specific sub-discipline of Zoology. The courses are given to senior faculty.
2	Learn the research design, methodologies, and execution of the project	Students are given tasks to make some hypothesis in the area of their interest	During research planning for Ph.D. degree	The ideas must not be copied	Students are forced to get latest review articles and device the hypothesis
3	Ability to compose the reports, and present and defend the results in an open forum.	Synopsis writing/Synopsis defense/ Thesis defense At least one research publication	Synopsis writing/Synopsis defense/Thesis defense	The problems are identified at presentation	The problems are solved accordingly

TABLE-2: STANDARD 1-2: OBJECTIVES VS OUTCOMES

	Objectives			
	Sr. No.	1	2	3
	1	***	**	***
	2	**	**	**
	3	**	**	**

* Relevant

** Relevant and satisfactory

*** Highly relevant and satisfactory

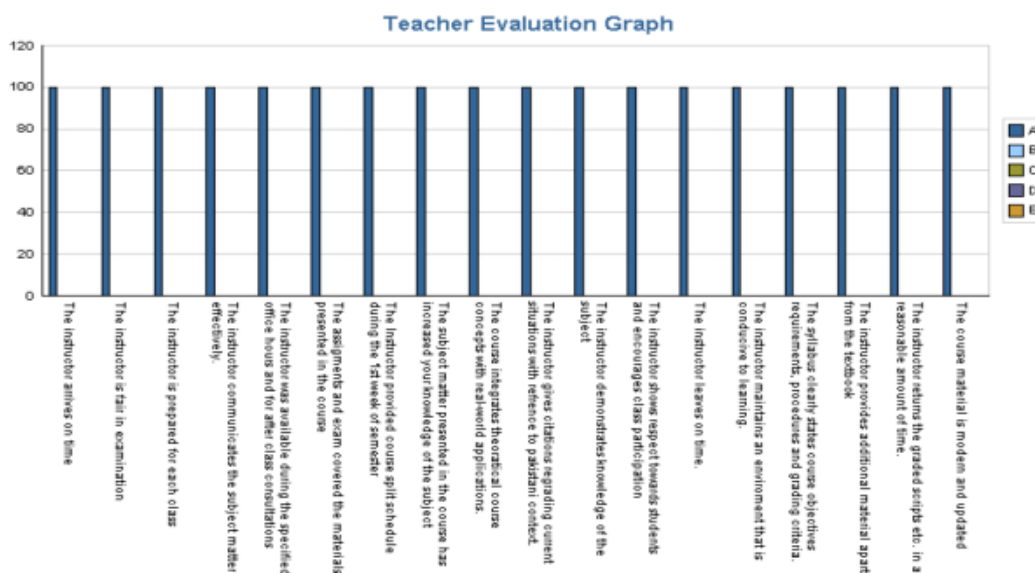
TEACHERS EVALUATION

Following teachers were evaluated:

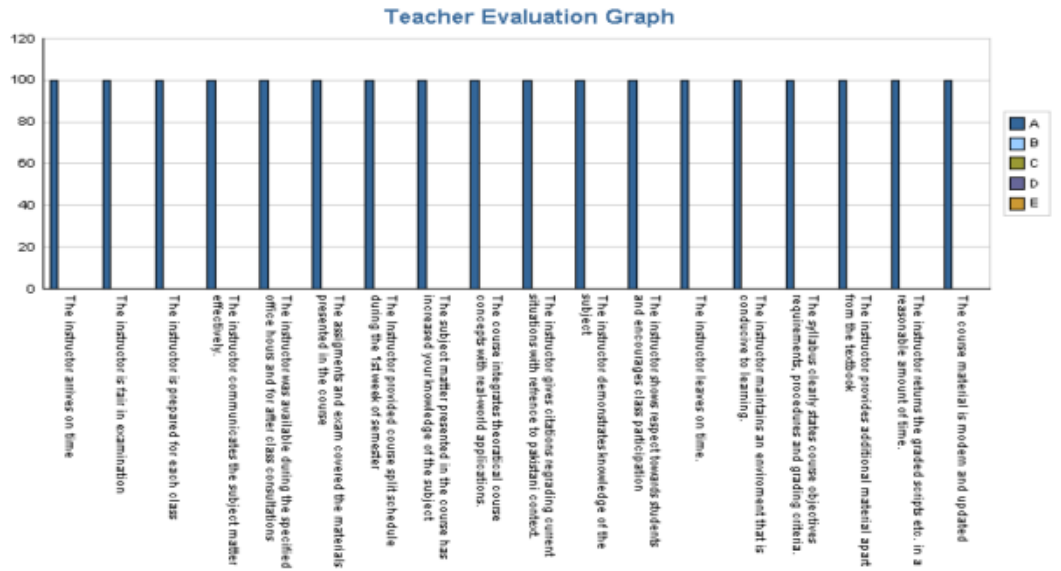
Courses	Course Titles	Credit Hours	Course Instructor's
ZOOL-752	Integrated Principles of Zoology	3(3-0)	Dr. M. Zubair Anjum
ZOOL-723	Aquaculture System Management	3(2-2)	Dr. M. Zubair Anjum
ZOOL-751	Project, Planning, Monitoring and Evaluation	3(3-0)	Dr. Shamim Akhtar

The teachers were evaluated by the students at the end of course completion through the proforma-10 (Annex-II). Detail of performance of each teacher is given below.

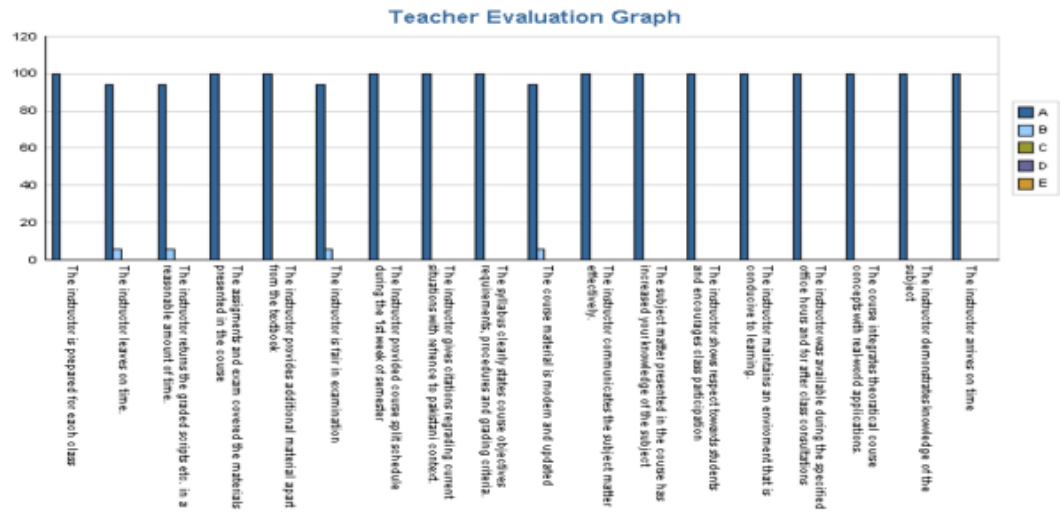
1. Dr. M. Zubair Anjum (ZOOL-752)



2. Dr. M. Zubair Anjum (ZOOL-723)



3. Dr. Shamim Akhtar (ZOOL-751)



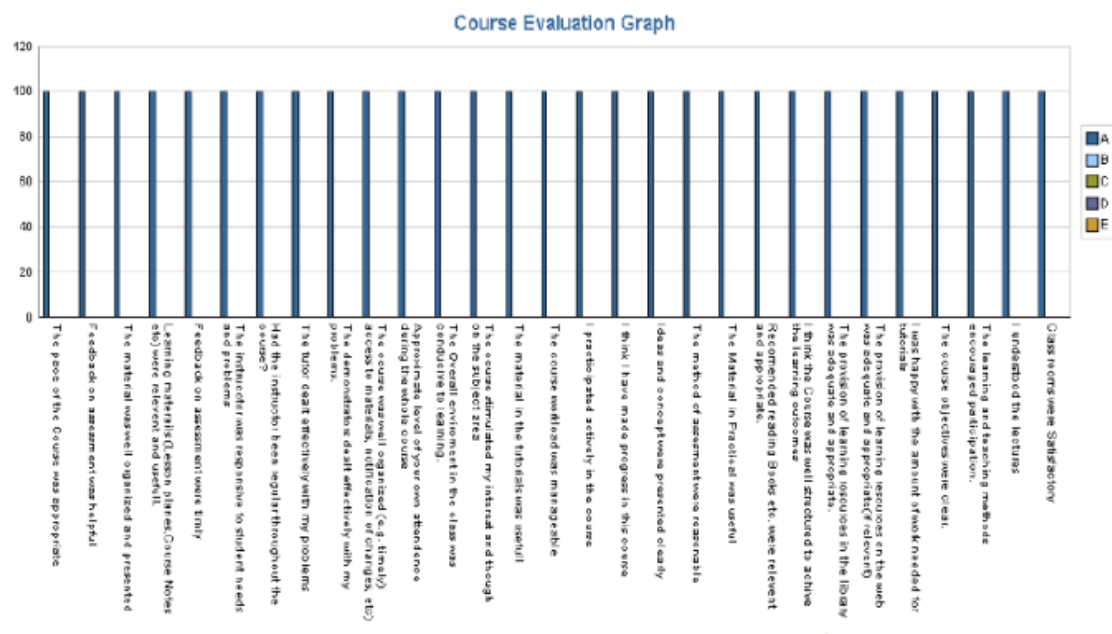
COURSE EVALUATION

Courses were evaluated by students at the end of course completion through proforma-1 (Annex-I). Detail of evaluation of each course is given below.

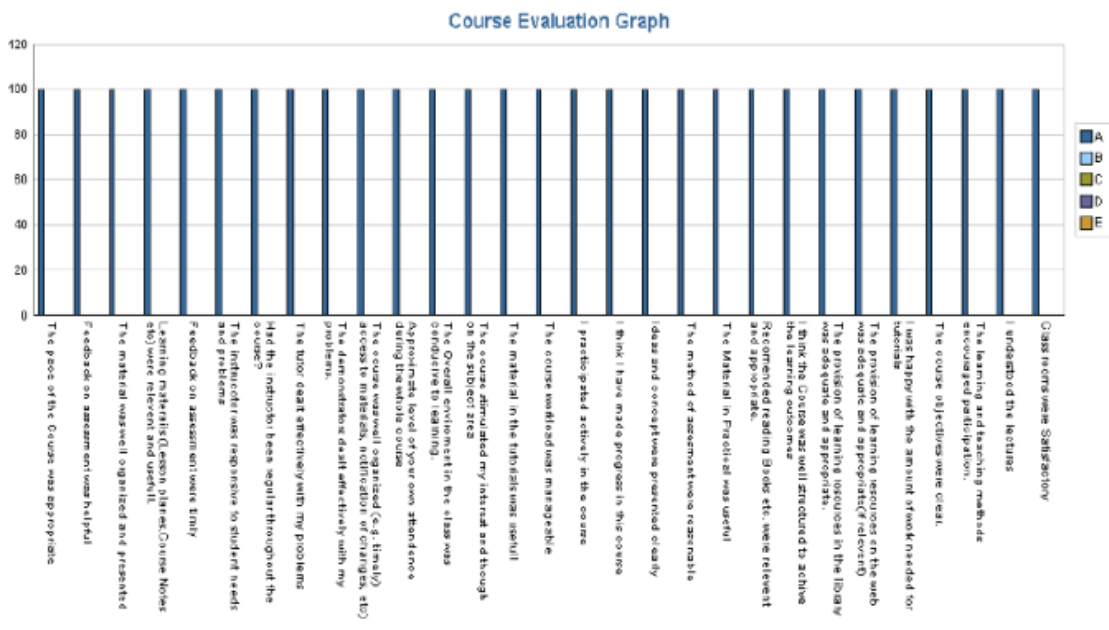
Table 3. Courses evaluated for Ph.D.

Courses	Course Titles	Credit Hours	Course Instructor's
ZOOL-752	Integrated Principles of Zoology	3(3-0)	Dr. M. Zubair Anjum
ZOOL-723	Aquaculture System Management	3(2-2)	Dr. M. Zubair Anjum
ZOOL-751	Project, Planning, Monitoring and Evaluation	3(3-0)	Dr. Shamim Akhtar

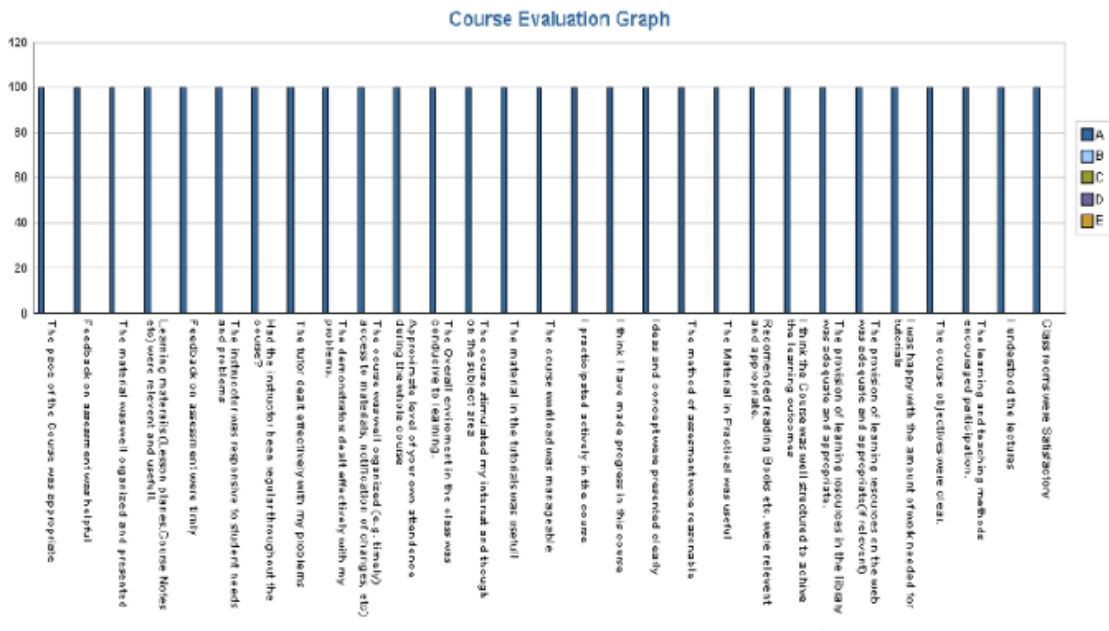
1. ZOOL-752



2. ZOOL-723



3. ZOO 751



Faculty Course Review Survey

The evaluation revealed that the faculty is satisfied with curriculum. Questionnaire for the evaluation has been filled and analyzed. The internal evaluation was done through with mid and final term examinations for all courses offered by department. Some of the teachers suggested division of certain courses as they were lengthy.

Faculty Course Review Survey

Code	Title	Credit value	Assessment method	No. of Students	Comments on curriculum	Any Change for future in course	Sem	Grades						Teacher
								A	B	C	D	E	F	
ZOOL-752	Integrated Principles of Zoology	3(3-0)	Mid/Final Exam	1	Appropriate	Not suggested	Spring	100	0	0	0	0	100	Dr. M. Zubair Anjum
ZOOL-723	Aquaculture Management System	3(2-2)	Mid/Final Exam	2	Appropriate	Not suggested	Fall	100	0	0	0	0	100	Dr. M. Zubair Anjum
ZOOL-751	Project, Planning, Monitoring and Evaluation	3(3-0)	Mid/Final Exam	2	Appropriate	Not suggested	Fall	10	70	20	0	0	0	Dr. Shamim Akhtar

ALUMNI SURVEY RESULTS

Feedback of students graduated was acquired through Proforma-7.

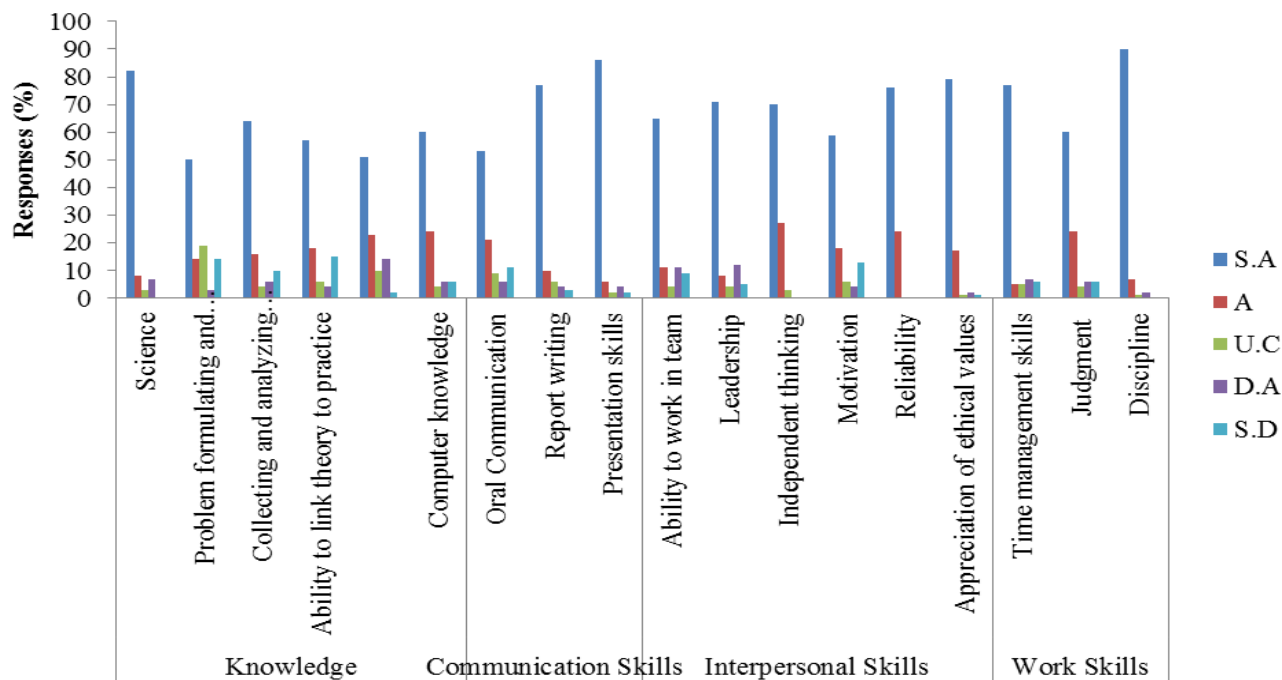


Fig.13. Alumni Survey Results

Research progress (2018-20)

Name of Faculty Member	Journal Publications	Conference publication	Projects
Dr. Mazhar Qayyum	8	2	0
Dr. Shamim Akhtar	36	4	1
Dr. Muhammad Sajid Nadeem	12	2	1
Dr. Amjad Rashid Kiyani	4	-	0
Dr. M. Mushtaq	8	-	0
Dr. Abida Arshad	4	1	1
Dr. M. Zubair Anjum	4	5	1
Dr. Ruqia Mehmood Baig	7	1	2
Dr. Muhammad Irfan	14	1	1

SURVEY OF GRADUATING STUDENTS

Survey of graduating students was conducted through Performa 3.

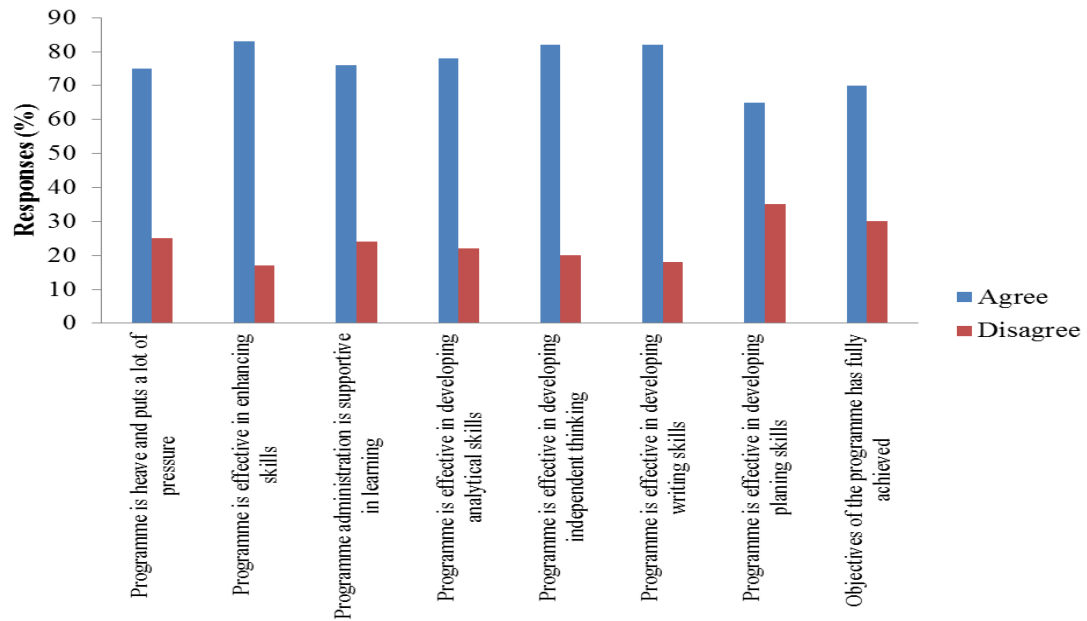


Fig.14. Graduating student's survey

RESEARCH STUDENTS PROGRESS REVIEW

Survey of M. Phil. research students progress review was conducted through Performa 2.

Results are given below in graphs

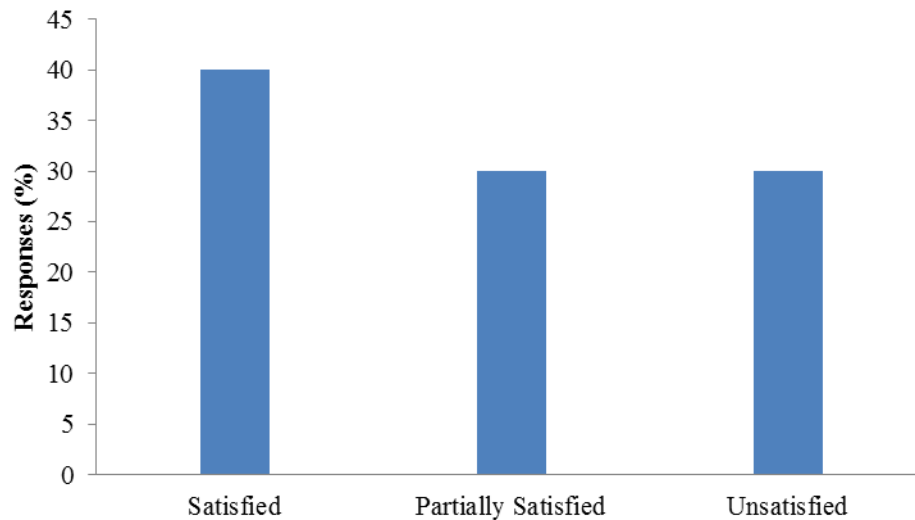


Fig. 15. Level of supervision received

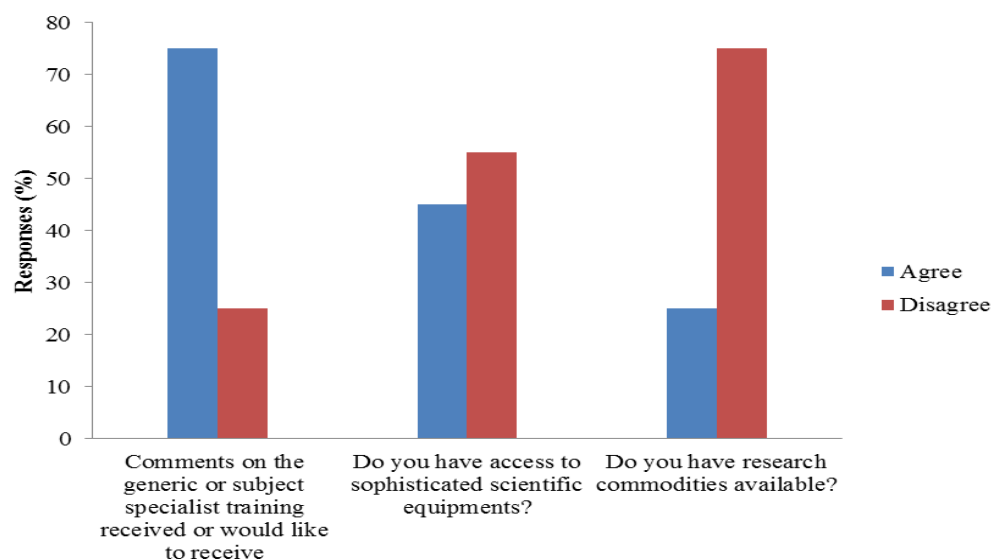


Fig.16. Response of students on Misc. issues

Results of Faculty Survey

The data generated as a result of faculty survey, most of the faculty themselves reported as very satisfied mentoring and administrative support, job security, support from the department, their progress through ranks. The least time availability to faculty to interact with their family is due to extra load on present teachers as some times of the faculty members proceed on training, workshops etc so the poor strength of remaining faculty in the campus has to bear out the load of course work and other assignments.

Results of Faculty Survey

	Dr. M. Zubair Anjum	Dr. Shamim Akhtar
Your mix of research, teaching and community service	V. Satisfied	Satisfied
The intellectual stimulation of your work	V. Satisfied	V. Satisfied
Type of teaching / research you currently do	Satisfied	Satisfied
Your interaction with students.	Satisfied	V. Satisfied
Cooperation you receive from colleagues	Satisfied	Satisfied
The mentoring available to you.	V. satisfied	V. Satisfied
Administrative support from the department	Satisfied	Satisfied
Providing clarity about the faculty promotion process	V. Satisfied	Satisfied
Your prospects for advancement and progress	Satisfied	V. Satisfied

Survey of department offering Ph.D. programs

Survey of department offering Ph.D. was conducted through proforma-6 and results are given as under:

1 General Information:	
1.1 Name of Department	Zoology
1.2 Name of Faculty	Science
1.3 Date of initiation of Ph.D. program	2001
1.4 Total number of academic journals subscribed in area relevant to PhD program	NIL
1.5 Number of Computers available per Ph.D. student	1
1.6 Total Internet Bandwidth available to all the students in the Department	6
2 Faculty Resources:	
2.1 Number of faculty members holding Ph.D. degree in the department	8
2.2 Number of HEC approved Ph.D. Advisors in the department.	8
3 Research Output:	
3.1 Total number of articles published last year in International Academic Journals that are authored by faculty members and students in the department.	15
3.2 Total number of articles published last year in Asian Academic Journals that are authored by faculty members and students in the department	8
3.3 Total number of ongoing research projects in the department funded by different organizations	5
3.4 Number of post-graduate students in the department holding scholarships/fellowships.	4
3.5 Total Research Funds available to the Department	200,000
3.6 Number of active international linkages involving exchange of researchers/students/faculty etc.	5
4 Student Information:	
4.1 Number of Ph.D. degrees conferred to date to students from the Department during the past three academic years.	9
4.2 Number of Ph.D. students currently enrolled in the department.	12
4.3 Ratio of number of students accepted to total number of applicants for Ph.D. Program.	1:2
5 Program Information	
5.1 Entrance requirements into Ph.D. Program (M.Sc. / M.Phil.) Indicate subjects or M.Sc. / M.Phil	M.Phil. Zoology
5.2 Is your Ph.D. program based on research only? (Y/N)	N
5.3 Maximum number of years in which a Ph.D. degree has to be completed after the initial date of enrollment in the Ph.D. program.	5 years
5.4 Total number of post M.Sc. (16 year equivalent) courses required for Ph.D.	32 credits
5.5 Total number of M.Phil. level courses taught on average in a Term / Semester	5/semester
5.6 Total number of Ph.D. level courses taught on average in a Term / Semester.	3/semester
5.7 Do your students have to take/write:	
a. Ph.D. Qualifying examination (Y/N)	yes
b. Comprehensive examination (Y/N)	yes
c. Research paper in Impact factor Journal	yes
d. Any other examination (Y/N)	GAT subject
5.8 Total number of International examiners to which the Ph.D.dissertation is sent.	2
5.9 How is the selection of an examiner from technologically advanced countries carried out?	Getting consent
5.10 Is there a minimum residency requirement (on campus) for award of Ph.D. degree?	3 years

STANDARD 1-3. The results of program's assessment and the extent to which they are used to improve the program must be documented

Regular assessment process will be continued and results will be incorporated accordingly. Following are the strengths and weaknesses of program identified.

Strengths of the Program

1. The department is having qualified teachers with full acquaintance of their respective subjects and knowledge of research
2. All faculty members are involved in research directly or indirectly as supervisor and committee member of the post-graduate students.
3. All faculty members have got research projects funded from various funding sources.

Weaknesses of the Program

1. There is scarcity of space as there is only two class rooms due to which difficulty is faced in adjusting simultaneous classes.
2. Funding and research equipment are not available.

STANDARD 1-4. The department must assess its overall performance periodically using quantifiable measures.

The evaluation process indicated high efficiency of system and satisfactory impact of outcomes

Future Plans

To establish the laboratories by getting projects funding by teachers.

Quantitative assessment of the department

S. No.	Particulars	No.
1	PhD degree awarded	25
4	Students: Faculty (ratio)	2:1
5	Technical: non technical (ratio)	4:1
6	Average grade point	4

EMPLOYER SURVEY

The employer survey under Performa 8 was conducted:

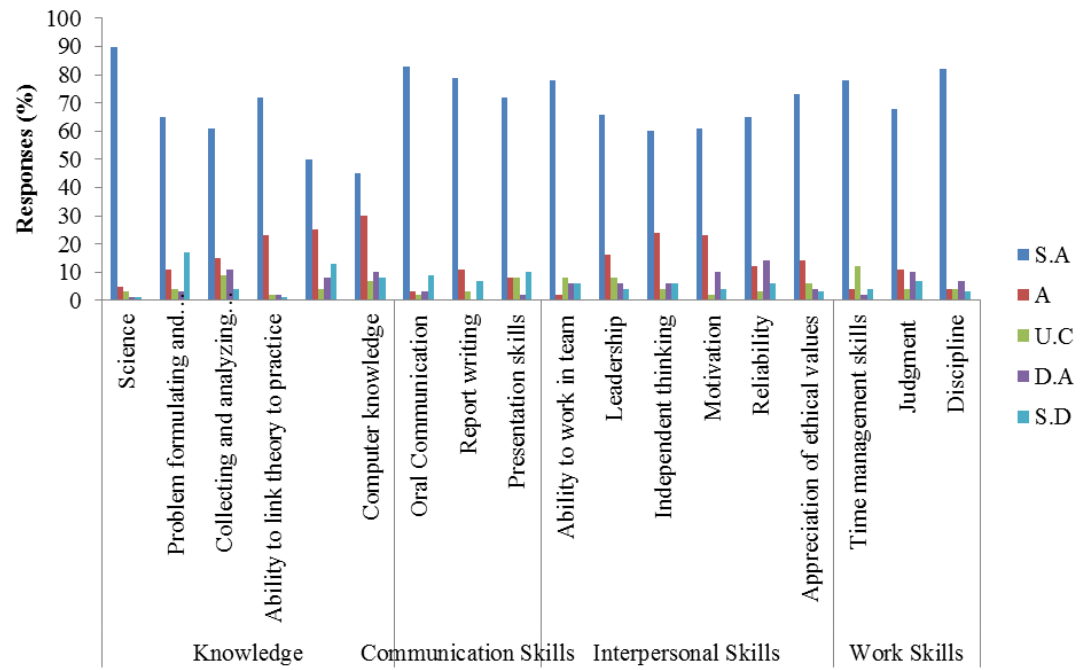


Fig.17. Employer's survey

SECTION 2

CRITERION-2: CURRICULUM DESIGN AND ORGANIZATION

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.

Degree Title:

Ph. D. Zoology

Definition of Credit Hour:

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.

Degree Plan:

PhD: Consists of 10 semesters/ 5 years. 20 credit hours course work following synopsis/thesis defense and submission of thesis to be approved by international scholars

Pre-requisites

Academic Requirements:

A person holding M.Phil. in animal sciences or equivalent degree from any recognized institute with at least second division or 3/4CGPA is eligible to get admission.

Merit is determined by entry test and past academic performance as per following formula:

Intermediate	10%
B.Sc.	20%
M.Sc.	20
M.Phil.	40
Interview	10%

Degree Requirements:

Degrees are awarded after completing the required 18 credit hours (courses). Minimum Grade Point Average for obtaining the degree is 3.00/4.00 CGPA. A thesis research is required of 10 credit hours.

Examination

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: The qualification marks for each examination is 50% . .

Mid Examination	30%
Assignments	10%
Final Examination	60%

For practical examination (if applicable) 100% is given to practical as scored final 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.

Compulsory Courses:

Course #	Course Title	Credit Hours
BCH-751	Advances in Biotechnology	3(3-0)
BOT-751	Integrated Agrobiological Resources Management	3(3-0)
ZOOL-720	Seminar-I	1(1-0)
ZOOL-751	Project Planning,, Monitoring and Evaluation	3(3-0)
ZOOL-720	Seminar-II	1(1-0)
STAT-702	Experimental Design and Computer Applications	3(2-2)
ZOOL-719	Special Problem	1(1-0)

Elective Courses

Course #	Course Title	Credit Hours
ZOOL-727	Epidemiology of animal parasites	3(2-2)
ZOOL-734	Mammalogy	3(2-2)
ZOOL-725	Human Genetics	3(2-2)
ZOOL-714	Medical Virology	3(2-2)
ZOOL-718	Applied Reproductive Physiology	3(2-2)
ZOOL-733	Ornithology	3(2-2)
ZOOL-715	Faunal Biodiversity of Pakistan	3(2-2)
ZOOL-712	Clinical Endocrinology	3(2-2)
ZOOL-723	Aquaculture system management	3(2-2)

Table 4.3. Curriculum Course Requirements

Semester	Course #	Credit Hours			
		Applied	Basic	Major/Minor	Practical
1st	BCH-751	3	-	Minor	-
	ZOOL-720	-	1	Major	-
	ZOOL-751	-	3	Major	-
	ZOOL-730	-	3	Major	2
2nd	STAT-702	2		Minor	2
	BOT-751	-	3	Minor	-
	ZOOL-720	-	1	Major	-
	ZOOL-719	1	-	Major	-

STANDARD 2-1: The curriculum must be consistent and supports the program's documented objectives

Courses	Objectives		
	1	2	3
BCH-751	**	**	**
ZOOL-720	**	**	**
ZOOL-751	*	**	***
ZOOL-730	**	**	*
STAT-702	*	**	***
BOT-751	*	**	*
ZOOL-720	**	**	***
ZOOL-719	**	***	***
Highly Satisfactory	***		
Satisfactory	**		
Not satisfactory	*		

STANDARD 2-2: ELEMENTS VS COURSES

Elements	Ph.D. Zoology Courses
Theoretical background	BOT-751, ZOOL-751, ZOOL-730
Problem analysis	ZOOL-719, ZOOL-720,
Solution Design	STAT-702 , BCH-751,

STANDARD 2-3:

The curriculum is designed and offered according to the requirements of HEC. There are compulsory basic and advance courses along with an applied course of statistics. Students have to opt a minimum 6 credit hours optional courses related to their field of research

STANDARD 2-4:

Higher Education Commission (HEC) course work of 18 credit hours preferably in the first year is required to be completed and followed by a comprehensive examination for granting candidacy as PhD researcher. The requirement of HEC is being fulfilled with offering 21 credit hours to Ph.D. students.

Program	Credit hours/semester	Total Credit hours	Theory	Practical	Other
Ph.D.	9	18	15	3	10 credit hours for research work/thesis.

STANDARD 2-5:

Courses being offered are highly informative and fulfilling the requirements but most of the courses are of basic nature and only one or two are applied. There is need to approve advance and applied courses for Ph.D. program.

STANDARD 2-6:

There is deficiency of information technology related courses but some activities and courses in program are useful to give basic training of computer use.

S. No.	Course No.	How applied and integrated through out the program
1	STAT-702	Use of statistical software pushes the students to learn basic use of computer
2	ZOOL-720, ZOOL-719	Seminar preparation requires the basic knowledge of computer sciences. It urges the students to learn basic use of computer. Same is the case with thesis writing
3	Synopsis and Thesis defense and write up	

STANDARD 2-7:

Two seminars of one credit hour each are compulsory at the Ph.D. level. Moreover, students have to defend their synopsis and thesis in open forum. Assignments are given to Ph. D students on specific titles (part of the course) which are presented orally and given as written report (assignments) by the students which have increased their oral and written communication skills. Thesis and synopsis write up are helpful to increase their oral and writing skills.

S. No.	Course No.	How applied and integrated through out the program
1	ZOOL-720	Two seminars of one credit hour each are compulsory at the Ph.D. level during course work
2	Courses presentations/assignments	During course work a presentation/assignment is obligatory for each course
3	Synopsis defense	Before commencing research in open forum
4	Thesis defense	After thesis writing in open forum

SECTION-3

CRITERION-3: LABORATORIES AND COMPUTING FACILITIES

Laboratory Title:

1. Microbiology and Parasitology laboratory
2. Genetics
3. Reproductive Physiology/Endocrinology/
4. Wildlife & Biodiversity laboratory
5. Animal Physiology laboratory
6. Fisheries laboratory

Location and Area:

Faculty of Sciences, D-Block, 2nd Floor, New Academic Block and area of each laboratory is 450 square feet

Objectives:

Laboratories are used for:

1. Practical exercise and demonstrations to graduate students in their introductory and major courses
2. Research work for the Post-graduate students
3. Used for implementing the funded projects by the University, HEC, PSF, PARC and other agencies.
4. Laboratories are well specious and adequate.

Major apparatus viz equipments:

Microscopes, autoclave, incubator, deep freezer, refrigerators, laminar flow cabinet, pH meter, elective balance, slide and overhead projectors, shaker, hitter, pipettes are present but some are out dated and out of order. Centrifuge (slow and ultra), PAG-Electrophoresis apparatus, PCR Spectrophotometer. Moreover, department requires an animal house and a museum

Safety Regulations:

Safety measures are not available against fire (Extinguishers), minor hazards and accidents, injuries (First Aid Kit). However, the University maintains a Medical Dispensary for such incidents.

STANDARD-3.1: LABORATORY MANUALS:

- Laboratory manuals of each subject (Microbiology and Parasitology, Reproductive Physiology, Wildlife & Biodiversity, Animal Physiology) are not available. The department has no library at all. However, individual teachers have their books.

STANDARD-3.2: SUPPORT/LABORATORY PERSONAL FOR MAINTENANCE OF LABORATORY

Laboratories are maintained by only one laboratory assistant (equipment, glassware, chemicals, material etc). A laboratory attendant assists the students in practicals, cleaning and washing.

STANDARD-3.3: COMPUTING INFRASTRUCTURE AND FACILITIES

- *Computer facilities:* available to all faculty members and the post graduate students

- ***Safety arrangements:*** The labs have no exhaust fan. No first aid kits/facilities provided in the laboratories/department.

SECTION-4

CRITERION 4: STUDENT SUPPORT AND ADVISING

The university organizes support programs and provide information regarding admission, scholarship schemes etc. Department in its own capacity arrange orientation and guided tours of department.

STANDARD-4.1: FREQUENCY OF COURSES

- Courses are taught as per criteria laid down by HEC.
- Courses are offered according to the scheme of study approved by Academic Council and courses are offered as per the availability and expertise of the teachers.
- Elective courses are offered according to the policy of the university.
- For postgraduate programs, a variety of courses are offered according to demand of the profession.

STANDARD-4.2: STRUCTURE OF THE COURSES

Theoretical as well as practical aspects are focused in designing the courses. Theoretical problems are explained and assignments are also given to the students. Practical are carried out in the labs as well as in the field. Field visits to related research organizations are also organized for the awareness of the students about the latest developments in the area and to stimulate them for discussion and teacher/student interaction.

- Board of Studies approved the course contents
- Faculty members interact frequently to the students to solve their problems. Students are always welcome to ask questions in class rooms and teachers are also available even after the classes.

STANDARD-4.3: GUIDANCE TO THE STUDENTS

Following steps have been taken for the guidance of the students:

1. Information about the program requirements are provided to the students through the office of the head of the department.
2. Through the personal communication of the teachers with the students
3. Students can also contact with relevant teachers whenever they face any professional problem.
4. Students can interact with the teachers/scientists in the universities or research organization according to their requirement and there is open option for the students to get the membership in the professional societies like Pakistan Zoological Society and other relevant professional societies.

SECTION-5

CRITERION-5: PROCESS CONTROL

It includes student admission, student's registration, faculty requirement activities which are dealt by various statutory bodies and the university administration.

STANDARD-5.1: PROGRAM ADMISSION CRITERIA

- The admission advertisement is given in the National Papers by the Registrar office. The criteria and rules of the admission are followed set by the University.
- PhD admission is based on the recommendations of supervisory committee
- Admission criteria is revised every year before the announcement of admissions

STANDARD-5.2: PROCESS OF REGISTRATION

- The student's name, after completion of the admission process, is forwarded to the Registrar Office for proper registration in the specific program and the registration numbers are issued to the students.
- 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. If the students 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 developed by the university is according to HEC rules.

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 per rules of the university

- The candidates are interviewed by the University Selection Board, principal and alternate candidates are selected.
- Selection of candidates is further approved by the Syndicate and then candidates are invited to join the university within a specified period.
- Induction of new candidates depends upon the number of approved vacancies.
- At present, no procedure exists for retaining highly qualified faculty members. However, the revised pay scales of structure is quite attractive
- HEC also supports appointments of highly qualified members as foreign faculty Professors, National Professors and deputes them in various departments of the university.

STANDARD-5.4: TEACHING AND DELIVERY OF COURSE MATERIAL

- The department revises the curriculum time to time depending upon the requirements, innovations and new technology to enhance the high quality teaching.
- With the emergence of new fields, new courses are designed and included in the scheme of study
- Students usually purchase low price editions books. Very few related books are also available in the university library, where documentation, copying and internet facilities are available.
- Some teachers also provides notes to the students
- Most of the lectures are supplemented by overhead, slides and pictures
- All efforts are made that 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 date of commencement of examination. After ~20-30 days of the examinations, the controller office notifies the results of the students. The evaluation procedure consists of mid and final examinations, practical formulas, assignments and reports, oral and technical presentations. Candidates who secure 80% or more marks are awarded grade A. Gold medals are awarded to the students who secure highest marks. Degrees are awarded to the students on the annual convocation that is held every year.

SECTION-6

CRITERION-6: FACULTY: Standard 6.1: Full Time Faculty
Table: 4.6

Name	Designation	Qualification	Country Awarding Degree	Date of Birth	E-mail Address
Dr. MazharQayyum	Professor	Ph.D.	Pakistan	7.6.1963	Mazhar_dr@yahoo.com
Dr. ShamimAkhtar	Professor	Ph. D	Pakistan	13.06.1964	sashraf1993@yahoo.com
Dr. Muhammad SajidNadeem	Associate Professor	Ph. D	Pakistan	04.04.1970	sajidnm@hotmail.com
Dr. Amjad Rashid Kiyani	Assistant Professor	Ph. D	UK	28-3-1966	ark120106@yahoo.co.uk
Dr. Muhammad Mushtaq	Assistant Professor	Ph. D	Pakistan	10.12.1970	mushtaq@uaar.edu.pk
Dr. M. ZubairAnjum	Assistant Professor	Ph. D	Austria	9-3-1978	zubair.anjum@uaar.edu.pk
Dr. AbidaArshad	Assistant Professor	Ph. D	China	23-03-1977	abida.arshad6@gmail.com
Dr. RuqiaMehmoodBaig	Lecturer	Ph. D	Pakistan	7-8-1983	dr.ruqia@uaar.edu.pk
Dr. Muhammad Irfan	Assistant Professor	Ph. D. student	Pakistan	16.02.1984	Muhammadirfan11@gmail.com

Table.4.7 Faculty Distribution by Program Areas

Program area of specialization	Courses in the area and average number sections per year	Number of faculty members in each area	Number of faculty with Ph. D degree
Microbiology/Parasitology	7	2	2
Wildlife	6	2	2
Biodiversity	2	1	1
Reproductive physiology	2	1	1
Endocrinology/Genetics	4	3	2
Fishreies	2	1	1

STANDARD 6.2: EFFECTIVE PROGRAMS FOR FACULTY DEVELOPMENT

1. Professional training and availability of adequate research and academic facilities are not provided according to the faculty members
2. Library facility is insufficient as no latest subject books are available.

STANDARD-6.3: FACULTY MEMBER MOTIVATION

- Time to time provision of enthusiasm to the young faculty by the senior faculty members.

SECTION-7

CRITERION-7: INSTITUTIONAL FACILITIES

INSTITUTIONAL FACILITIES

The institution is working toward acquisition of infrastructure to support new trends in learning such as e-learning

- Electronic library books and journals are available for learning purpose.
- Facilities regarding the infrastructure to support new trends in learning are being provided

However, the library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personal.

- Insufficient library's technical collection of books
- Recommended books, relevant journals of the programs are not available to the students.

Classrooms and offices must be equipped with multimedia and air conditioners and working places of faculty must be adequate to enable them to carry out their responsibilities.

STANDARD-7.1: INFRASTRUCTURE

The faculty is provided with laptops under the Chief Minister Punjab scheme which is very helpful to assess e-resources for the high quality education and producing research of international standard. However, telephone sets/connections are not present.

STANDARD-7.2: LIBRARY FACILITIES

The Central Library being a small library has sufficient space, but less number of books, journals and periodicals with no catalogue frameworks. The department itself does not have a library.

STANDARD-7.3: CLASS ROOM AND FACULTY OFFICES

At present only two class rooms are available for all the degree programs being offered. Rooms are equipped with white boards and lacking multimedia. The learning environment is not conducive being very cold in winter and very hot in summer. No heater and air conditioner is installed in class rooms, labs and offices. Two to three teachers are sharing an office.

SECTION-8

CRITERION-8: INSTITUTIONAL SUPPORT

The faculty and administration are trying their best to facilitate academic and research activities of the department. The administration is keen for promoting and establishing research culture by appointing highly qualified faculty.

INTSTITUTIONAL SUPPORT:

The working places for faculty are inadequate as two to four teachers share a small office. Moreover, being on second floor, offices are not comfortable usually in hot or cold weather and there is no provision of heater and airconditioners.

STANDARD-8-1: SUPPORT AND FINANCIAL RESOURCES

The department does not have enough funds to support even a single PhD research student. However, the individual research grants for faculty are mainly supporting the departmental research activities. It is needed to increase financial resources of the department to support research and academic activities.

STANDARD-8-2: HIGH QUALITY RESEARCH SCHOLARS

Research Assistants	Ph.D. Students
3	25

Faculty to Ph.D. students ratio is 1:3.7

STANDARD-8-3: FINANCIAL RESOURCES

The total budget of the department of Zoology for the financial year 2018-20 is insufficient for the purchase of equipment, chemicals etc.

SUMMARY

The department of Zoology was established in 1997, however, started the PhD degree program in Zoology in 2001. The PhD degree program requires a minimum of three years of full-time study, a year of course work and two years research with an individual supervisor. The admissions in PhD program requires an 18 years education in Zoology with at least CGPA 3.00/4.00. The program aims to train the students in advanced as well as classical aspects of Zoology. The students get admission in the program are given opportunity to specialize in the field of their own interest. The students are pushed to learn solution of theoretical as well as practical problems in the science particularly in the Zoology. The evaluation of PhD students involves midterm exam, final exam, comprehensive exam and open research defenses. There are 10 faculty members out of them 9 having doctoral degrees and HEC approved supervisors. Graduates acquire a general biological and scientific background as well as gain experience in problem solving and develop the communication, numerical and computer skills. The department and university are keen to maintain the quality of education and research. In this regard, the performance of departmental staff and evaluation of programs run by department is done on semester basis. The programme objectives are well defined, and outcomes are satisfactory and relevant. The department is capable only to support basic research activities from individual faculty project funding. A total of four research projects was running at the time. Admissions, examinations and all other academic activities are carried out according to the rules and regulation set by Higher Education Commission (HEC), Pakistan. According to teaching and course evaluation, the department is imparting knowledge of biological sciences excellently. The students are guided properly about programme requirements, presentations, scientific societies, and conferences. Survey of alumni, graduating students and employer were satisfactory. Faculty and students are satisfied with working environment and published more than 100 research articles and 14 conference papers in journals of repute during 2018-20. During 2018-20, faculty won and completed 11 research projects. However, progress can be improved by providing sophisticated laboratory equipment and research budget.

List of courses offered
Ph. D Zoology

Course #	Course Title	Credit Hours
BCH-751	Advances in Biotechnology	3(3-0)
BOT-751	Integrated Agrobiological Resources Management	3(3-0)
ZOOL-720	Seminar-I	1(1-0)
ZOOL-751	Project Planning,, Monitoring and Evaluation	3(3-0)
ZOOL-720	Seminar-II	1(1-0)
STAT-702	Experimental Design and Computer Applications	3(2-2)

FACULTY RESUMES

1. CURRICULUM VITAE

1. Personal Data

Name: Dr. Muhammad Sajid Nadeem

Present Address: Associate Professor,
Department of Zoology, Pir Mehr Ali Shah Arid Agriculture
University, Murree road, Rawalpindi, Pakistan.

Telephone 0300-8539455

E-mail sajidnm@uaar.edu.pk

2. Academic Qualification

- Ph. D. in Zoology from University of the Punjab, specializing in wildlife. (Year 2005)
Thesis: Ecology of Houbara Bustard (*Chlamydotis undulata macqueenii*) in Punjab Nag Valley (Balochistan) and Uzbekistan.
- Master of Science in Zoology from University of The Punjab, specializing in wildlife research and fieldwork (year 1994).
Thesis: Behavioural patterns of Blue Peafowl (*Pavo cristatus*) in Changa Manga Wildlife Sanctuary.
- Bachelor of Science with Botany, Geography and Zoology from Islamia University Bahawalpur. (Year 1990)

3. Area of Specialization: Wildlife / ecology / conservation

4. HEC approved supervisor

5. Professional Experience (Research and Teaching): 15 years

6. Fellowship/Membership of Professional Associations/Societies: 05

7. Research Projects; Completed=02; ongoing=01

8. Participation in Conferences/Workshops: 23

9. Supervision of Post-Graduate Theses: a) Ph.D.:3; b)M.Phil.: 17.

10. Publications

a. Papers Published in Peer Reviewed Journals: 12

Publications during reported period (2018-20)

1. Nadeem, M. S; Mahmood, T; and Mahmood-ul-Hassan, M. 2014. Breeding success of Stone Curlew *Burhinus oedicnemus* in Nag Valley (1999-2001), Kharan, Pakistan. *Turk. J. Zool.* 38(4): 510-514.
2. Noureen, S; Nadeem, M. S; Beg, M. A; and Anwar, M. 2014. Seasonal variation in the reproductive tract of the Indian flying fox, *Pteropus giganteus* (Brünnich, 1782). *Animal Biology*, 64(4):343-364.
3. Irshad, N; Mahmood, T; Hussain, R. and Nadeem, M. S. 2015. Distribution, abundance and diet of Indian Pangolin (*Manis crassicaudata*) *Animal Biology*, 65(1):57-71.
4. Irshad, N; Mahmood, T; and Nadeem, M. S. 2016. Morpho-anatomical characteristics of Indian Pangolin (*Manis crassicaudata*) from Potohar Plateau, Pakistan. *Mammalia*, 80(1):103-110.
5. Mahmood, T; Irshad, N; Hussain, R; Akrim, F; Hussain, I; Anwar, M; Rais, M. and Nadeem, M. S. 2016. Breeding habits of Indian Pangolin (*Manis crassicaudata*) in Potohar Plateau, Pakistan. *Mammalia*, 80(2): 231-234.

b) Without Impact Factor (included in ISI list)

6. Mushtaq, M; Kayani, A.R; Nadeem, M. S; and Beg, M.A. 2014. Distribution Pattern of Commensal Rodents in shops of Urban Rawalpindi. *Pak. J. Zool.* 46(6):1585-1589.
7. Mahmood, T; Nazir, S.A; Fatima, H; Akrim, F; Hussain, R; and Nadeem, M. S. 2015. Temporal variation in Reproductive Physiology of Small Indian Mongoose Male (*Herpestes javanicus*) inhabiting Potohar Plateau, Pakistan. *Pak. J. Zool.* 47(5):1263-1270.
8. Mahmood, T; Andleeb, S; Anwar, M; Rais, M; Nadeem, M. S. Akrim, F; and Hussain, R; 2015. Distribution, Abundance and Vegetation Analysis of Scaly Anteater (*Manis crassicaudata*) in Margalla Hills National Park Islamabad, Pakistan. *J. Anim. Plant Sci.* 25 (5):1311-1321.
9. Rashid, N; Irfan, M; Nadeem, M. S; Shabbir, A. 2016. Comparative Seasonal Haematology of two Bat Species, *Scotophilus heathii* and *Pipistrellus pipistrellus*, in a Subtropical Area of Pakistan. *Pak. J. Zool.* 48(5):1503-1510.
10. Nighat, S; Nadeem, M. S; Mahmood, T; Kayani, A.R; Mushtaq, M; and Mahmood ul Hassan, M. 2016. Estimation of Heavy Metals in Indian Flying Fox *Pteropus giganteus* (Brünnich, 1782) from Punjab, Pakistan. *Pak. J. Zool.* 48(6):1787-1792.
11. Shah, S.I; Beg, M.A; Nadeem, M.S; Faiz, M; Kayani, A.R; Rashid, N. and Irfan, M. 2016. Occurrence of Rabies and dog bite in Rawalpindi District, Pakistan. *Annals of PIMS.* 12(3): 118-123.
12. Khan, A; Mushtaq, M; Nadeem, M.S; Kayani, A. R. and Irfan, A. 2016. Testing Aluminum Phosphide in Indian Crested Porcupine Burrows as a Pest Management technique in Bannu, Pakistan. *Asian J. Agri. Biol.*, 4(4):91-96.

3. CURRICULUM VITAE

1. Personal Data

Name: Dr. Amjad Rashid Kayani

Present Address: Assistant Professor

Department of Zoology, Pir Mehr Ali Shah Arid Agriculture University, Murree road, Rawalpindi, Pakistan.

Telephone 0332- 5268134

E-mail a.r.kayani@uaar.edu.pk

2. Academic Qualification

- **Ph.D.** (Zoology) 2006 The University of Reading, UK
- **M.Sc.** (Zoology) 1988 University of Agriculture, Faisalabad
(Marks obtained 751 out of 920; 83%; **Ist Div.**; **CGPA 3.93**)
- **B.Sc.** (Zoology, Botany & Geography) 1985 Govt. Postgraduate College Jhelum, The University of Punjab, Lahore
(Marks obtained 496 out of 800; 62%; **Ist Div.**)

3. Area of Specialization: Animal ecology, behavior and reproductive biology

4. HEC approved supervisor: Yes

5. Professional Experience (Research and Teaching): 25 years

6. Fellowship/Membership of Professional Associations/Societies: 01

7. Research Projects; Completed=02

8. Participation in Conferences/Workshops: 06

9. Supervision of Post-Graduate Theses: a) Ph.D.:2 (in progress); b) M .Phil.: 08.

Distinctions:

- **University Distinction:** Stood first in the order of merit among all students who qualified for M.Sc. Zoology during calendar year 1988, The University of Agriculture, Faisalabad

- **University Merit Scholarship**, The University of Agriculture Faisalabad, 1986-87 and 1987-88
- **TROSS Scholarship** from Ministry of Science & Technology, Government of Pakistan (2001) for PhD study in UK

10. Publications

Papers Published in Peer Reviewed Journals:

4

Publications during reported period (2018-20)

1. Nighat, S., Nadeem, M.S., Mehmood, T., Kayani, A.R., Mushtaq, M and Hassan, M. 2016. Estimation of Heavy Metals in Indian Flying Fox *Pteropus giganteus* (Brunnich, 1782) from Punjab, Pakistan. *Pakistan Journal of Zoology*, 48(6): 1787 – 1792.
2. Irfan, M., Ismail, M., Beg, M.A., Shabbir, A., Kayani, A.R. and Raja, G.K. 2016. Association of The MTHFR C677T (rs1801133) Polymorphism with Idiopathic Male Infertility in Local Pakistani Population. *BJMG*, 19(1) : 51 – 62.
3. Khan, A., Mushtaq, M., Nadeem, M.S., Kayani, A.R. and Ahmad, I. 2016. Testing aluminium phosphide in Indian Crested Porcupine burrows as a pest management technique in Bannu, Pakistan. *Asian J Agri Biol*, 4(4): 91 – 96.
4. Mushtaq, M; Kayani, A.R; Nadeem, M.S. and Beg, M.A. 2014. Distribution Pattern of Commensal Rodents in Shops of Urban Rawalpindi, Pakistan. *Pakistan Journal of Zoology*, 46(6): 1585- 1589

4. CURRICULUM VITAE

1. Personal Data

Name: Dr. Mazhar Qayyum

Present Address: Professor,
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Telephone 051-9062267

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2. Academic Qualification

DEGREE	YEAR	SUBJECTS	INSTITUTIONS
Post Doctorate	2003	Parasitology	Louisiana State University, USA
Ph.D	1997	Parasitology	Quaid-I-Azam University, Islamabad, Pakistan
M.Phil	1991	Parasitology	Quaid-I-Azam University, Islamabad, Pakistan
M.Sc	1989	Biology (Animal Sciences)	Quaid-I-Azam University (Animal Sciences), Islamabad, Pakistan

3. Area of Specialization: Parasitology

4. HEC approved supervisor

5. Professional Experience (Research and Teaching): 19 years

6. Fellowship/Membership of Professional Associations/Societies: 03

7. Research Projects; Completed=04

8. Participation in Conferences/Workshops: 20

9. Supervision of Post-Graduate Theses: a) Ph.D.:10; b) M.Phil.: 23.; M. Sc. 13

10. Publications

Papers Published in Peer Reviewed Journals: 8

Publications during reported period (2018-20)

1. IRFAN MUSTAFA, RANA MUHAMMAD KAMRAN SHABBIR , MARGHOOB SUBHANI, IFTIKHAR AHMAD, ALEEM RAZA, SADAF JAMIL , HIRA MUQADDAS, RANA GHULAM SHABBIR, ABDUL

GHANI, TAHIR MAHMOOD, MUHAMMAD ASLAM, MOBUSHIR RIAZ KHAN, SAIRA ASIF, INAYAT ULLAH MALIK, ABU BAKAR MUHAMMAD RAZA, MUHAMMAD ANJUM AQEEL, MAZHAR QAYYUM, AYESHA WAQAS AND HAROON AHMED. 2014. Seasonal Activity of Tick Infestation in Goats and Buffalo of Punjab Province (District Sargodha), Pakistan. *Kafkas Univ Vet Fak Derg*, 20 (5): 655-662.

2. KIRAN AFSHAN, CESAR A. FORTES-LIMA, PATRICIO ARTIGAS, M. ADELA VALERO, MAZHAR QAYYUM, SANTIAGO MAS-COMA, 2014. Impact of climate change and man-made irrigation systems on the transmission risk, long-term trend and seasonality of human and animal fascioliasis in Pakistan. *Geospatial Health*, 8(20): 317-334.
3. NISAR AHMAD and MAZHAR QAYYUM, 2014. Seroprevalence and risk factors for toxoplasmosis in large ruminants in northern Punjab, Pakistan. *J. Infect. Dev. Ctries.*, 8(8):1022-1028.
4. NISAR AHMAD, HAROON AHMED, SHAMAILA IRUM AND MAZHAR QAYYUM, 2014. Seroprevalence of IgG and IgM antibodies and associated risk factors for toxoplasmosis in cats and dogs from subtropical arid parts of Pakistan. *Tropical Biomedicine*, 31(4): 777–784.

NATIONAL JOURNALS

5. SHAMAILA IRUM, MAZHAR QAYYUM, KATARZYNA DONSKOW-ŁYSONIEWSKA, M. ZIA-UL-HAQ AND MICHAEL J. STEAR, 2014. Genetic Variability in β -tubulin-1 in Benzimidazole Resistant *Haemonchus contortus* from Sheep in North-East Punjab, Pakistan. *Pakistan J. Zool.*, 46(2), 431-435.
6. AKHTER, S., M. S. ANSARI, B. A. RAKHA, S. M. H. ANDRABI, MAZHAR QAYYUM AND N. ULLAH, 2014. Effect of Fructose in Extender on Fertility of Buffalo Semen. *Pakistan J. Zool.*, 46(1), 279-281.
7. MUFTI, S., K. AFSHAN, I. A KHAN, Y. ZAFAR, S.S. R RIZVI, F. NAZIR AND MAZHAR QAYYUM. 2014. Genetic Characterization of *Fasciola* Samples from Bovine Hosts in Pakistan by Sequences of Ribosomal Internal Transcribed Spacer Regions. *Pak. Vet. J.*, 34(3): 361-366.
8. NISAR AHMAD, MUHAMMAD MUKHTAR, MUHAMMAD MUSHTAQ, KHALID MEHMOOD KHAN AND MAZHAR QAYYUM, 2014. Seroprevalence and Associated Risk Factors of Toxoplasmosis in Sheep and Goats in Pothwar Region, Northern Punjab, Pakistan. *Pakistan J. Zool.*, 46(6), 0-0. (In Press)

5. CURRICULUM VITAE

1. Personal Data

Name: Dr. Shamim Akhtar

Present Address: Professor

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University, Murree road, Rawalpindi, Pakistan.

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E-mail sashraf1993@gmail.com

2. Academic Qualification

1.	Ph.D. (Zoology)	University of Arid Agriculture, Rawalpindi	2006
2	M.Phil. (Zoology)	University of Agriculture, Faisalabad.	1991
3	M.Sc. (Zoology)	University of Agriculture, Faisalabad.	1987
4	B.Sc (Zool, Bot, Chem)	University of the Punjab, Lahore	1985
Post Doctoral Fellowship :		Commonwealth Post Doctoral Fellowship at “The Royal Veterinary College, University of London, UK. 2009	

3. Area of Specialization: Reproductive Physiology

4. HEC approved supervisor

5. Professional Experience (Research and Teaching): 15 years

6. Fellowship/Membership of Professional Associations/Societies: 02

7. Research Projects; Completed=06; ongoing=01

8. Participation in Conferences/Workshops: 20

9. Supervision of Post-Graduate Theses: a) Ph.D.:1; b) M.Phil.: 23; M.Sc. 20.

10: International collaborations = Three institutes/universities

11. Publications

Publications during reported period (2018-20)**PUBLICAIONS IN JOURNALS (INTERNATIONAL)**

1. Rakha, B. A., M. S. Ansari., I. Hussain, M. Anwar., Shamim Akhter and E. Blesbois. 2016. Cryopreservation of Indian red jungle fowl (*Gallus gallus murghi*) semen. *Animal Reproduction Science*, 174: 45-55.
2. Ali,S., Shamim Akhter; H. Neubauer, A. Scherag; M. Kesselmeier, F. Melzer; I. Khan, H. El-Adawy; A. Azam; S. Qadeer and Q. Ali. 2016. Brucellosis in Pregnant Women from Pakistan: An Observational Study. *BMC Infectious Diseases*. DOI 10.1186/s12879-016-1799-1.
3. Husna, A.U., R. Ejaz, S. Qadeer, A. Azam, B. A. Rakha, M. S. Ansari, Q. Shahzad, M. Javed, M. H. Vazquez-Levin , Shamim Akhter. 2016. A comparative analysis of sperm selection procedures prior to cryopreservation on Nili-Ravi buffalo bull (*Bubalus bubalis*) semen. Assessment of its impact on post-thaw sperm functional quality. *Animal Reproduction Science*, 174: 29-36.
4. Qadeer, S., M.A. Khan, M.S. Ansari, B.A. Rakha, R. Ejaz, A. Hussna, A. Azam, N. Ullah, V. K. Walker and Shamim Akhter. 2016. Cryopreservation of Nili-Ravi Buffalo Bull Sperm Amended With *Lolium Perenne* Protein Preparations. *Cryoletters* (Accepted).
5. Ansari, M. S., B.A. Rakha and Shamim Akhter. 2016. Effect of Thioglycol on Fertility of Frozen Nili-Ravi Buffalo semen. *Buffalo Bulletin*, 35: 277-281.
6. Ejaz, R., M.S. Ansari, B.A. Rakha, A.U. Husna, S. Qadeer, R. Iqbal, N. Ullah and Shamim Akhter 2016. Cholesterol Supplementation in Extender Improves Quality of frozen-thawed Nili-Ravi Buffalo bull semen. *Buffalo Bulletin*, 35: 259-267.
7. Qadeer, S., M. A. Khan, M. S. Ansari, B. A. Rakha, Q. Shahzad, R. Ejaz, A. U. Husna, A. Azam, J. G. Duman and Shamim Akhter. 2016. Efficiency of beetle (*Dendroides canadensis*) recombinant antifreeze protein for buffalo semen freezability and fertility. *Theriogenology*, 86: 1662-1669.
8. Rakha, B. A., M. S. Ansari., I. Hussain, M. Anwar., Shamim Akhter and E. Blesbois. 2016. Comparison of extenders for liquid storage of Indian red jungle fowl (*Gallus gallus murghi*) spermatozoa. *Avian Biology Research*, 9: 207-212.
9. Ansari, M. S., B.A. Rakha, Shamim Akhter, M. Ashiq. 2016. OPTIXcell® improves the post thaw quality and fertility of buffalo bull sperm. *Theriogenology*. 85: 528-532.
10. Ansari, M. S., B. A. Rakha, M.F. Malik, S. M. H. andrabi, N. Ullah, R. Iqbal., W. V. holt, and Shamim Akhter. 2016. Effect of cysteine addition to the freezing extender on the progressive motility, viability, plasma membrane and DNA integrity of Nili Ravi buffalo (*Bubalus bubalis*) bull spermatozoa. *Journal of Applied Animal Research*, 44: 36-41.

11. Shamim Akhter, S. Qadeer., M.A. Khan., M.S. Ansari., B.A. Rakha. 2016. Cryopreservation of Nili Ravi (*Bubalus bubalis*) buffalo bull Semen: The role of antifreeze glycoproteins (AFGPs). *Thai J. Vetr. Med. Suppl*; 46:91-94.
12. Rehman, S.A., Shamim Akhter, S. H. Khan and M. A. Anjum. 2016. A comparative study on quality, proximate composition and cholesterol content of eggs and meat in Fayoumi and commercial White Leghorn chickens. *Cogent Food & Agriculture*, 2: 1195539.
13. Qadeer, S., M. A. Khan, M. S. Ansari, B. A. Rakha, R. Ejaz, R. Iqbal, M. Younis, N. Ullah, Arthur L. DeVries and Shamim Akhter. 2015. Efficiency of Antifreeze Glycoproteins for Cryopreservation of Nili-Ravi (*Bubalus bubalis*) Buffalo Bull Sperm. *Animal Reproduction Science* 157: 56-62.
14. Rakha, B. A., M. S. Ansari, I. Hussain, M. F. Malik, Shamim Akhter and E. Blesbois. 2015. Semen characteristics of the Indian Red Jungle Fowl (*Gallus gallus murghi*). *Eur J Wildl Res.* 61:379–386.
15. Rakha, B. A., M. S. Ansari, I. Hussain, M. F. Malik and Shamim Akhter. 2015. Impact of Ejaculate Frequencies on the Quality of Red Jungle Fowl (*Gallus gallus murghi*) Semen. *Avian Biology Research*. 8 (2), 2015.
16. Ali, S., Shamim Akhter, H. Neubauer, F. Melzer, I. Khan, Q. Ali and M. Irfan . 2015. Serological, cultural and molecular evidence of *Brucella* infection in small ruminants in Pakistan. *The Journal of Infection in Developing Countries*. 9(5):470-5.
17. Zaman, N., M. J. Asad, A. Raza, G. K. Raja, Shamim Akhter, M. Mahmood, R. T. Mahmood. 2014. Presence of HCV RNA in peripheral blood mononuclear cells may predict patients' response to interferon and ribavirin therapy. *Ann Saudi Med. Med*; 34(5): 401-406.
18. Qadeer, S., M. A. Khan, M. S. Ansari, B. A. Rakha, R. Ejaz, A.U. Husna, M. Ashiq, R. Iqbal, N. Ullah and Shamim Akhter. 2014. Evaluation of Antifreeze Protein III for Cryopreservation of Nili-Ravi (*Bubalus bubalis*) Buffalo Bull Sperm. *Anim. Reprod. Sci.*, 148: 26-31.
19. Ali, S., I. Khan, Q. Ali, S. U. Khan, Z. S. Mirza and Shamim Akhter. 2014. Isolation and characterization of *Aeromonas sobria* in *Catla catla* (Thaila) affected with hemorrhagic septicemia. *B. Eur. Assoc. Fish Pat.* 34: 35-42.
20. Ejaz, R., M. S. Ansari, B.A. Rakha, N. Ullah, A. U. Husna, R. Iqbal and Shamim Akhter. 2014. Arachidic acid in extender improves post-thaw parameters of cryopreserved Nili-Ravi buffalo bull semen. *Reproduction in domestic animals*. 49: 122-125.
21. Ali, S., Q. Ali, F. Melzer, I. Khan, Shamim Akhter, H. Neubauer, S. M. Jamal. 2014. Isolation and identification of bovine *Brucella* isolates from Pakistan by biochemical tests and PCR. *Tropical Animal health and Production*. 46:73–78.

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PUBLICAIONS IN JOURNALS (NATIONAL)

22. Ali, S., Shamim Akhter, A. Muhammad, I. Khan, W. A. Khan, Muhammad Naeem Iqbal, Sajid Umar, Haroon Ahmed and Qurban Ali. 2016. Identification, Characterization and Antibiotic Sensitivity of *Aeromonas hydrophila*, a Causative Agent of Epizootic Ulcerative Syndrome in Wild and Farmed Fish from Pothwar, Pakistan. *Pakistan Journal of Zoology*. 48(3): 899-901.
23. Toor, S., Toor, S., Ashraf, A., Alam, S., Anwaar, S., Saddiqa, A., Ali, S., Toor, S., Muhammad, A. and Shamim Akhter. 2016. Prevalence of Liver disorders in Islamabad City. *PSM Biological Research* 1: 31-33.
24. Shamim Akhter, M. S. Ansari, B. A. Rakha, T. Aziz, S. M. H. Andrabi, N. Ullah, M. Anwar and M. Qayyum. 2015. Effect of Milk Based Extenders on Motility and Acrosomal Integrity of Buffalo Bull (*Bubalus bubalis*) Spermatozoa at 5°C. *Pakistan Journal of Zoology*. 47: 1645-1648.
25. Sarwar, G., Shamim Akhter, S. H. Khan, M. A. Anjum and M.A. Nadeem. 2015. Effect of different dietary protein and energy levels on the growth performance, meat and body fat composition in broiler chicks. *Pak. J. Agri. Sci.*, Vol. 52 : 1125-1129.
26. Ali, M. R., M. Afzal, R. Kousar and Shamim Akhtar. 2015. Transportation and Acclimatization of Giant River Catfish *Sperata seenghala* (sykes): an attempt for its induction in culture system. *Pak. J. Agri. Sci.*, Vol. 52 : 1-5.
27. Zaman, N., M. J. Asad, A. Raza, G. K. Raja, Shamim Akhter, M. Mahmood and R. T. Mahmood. 2015. Detection of HCV RNA and NS5A Protein in Peripheral Blood Mononuclear Cells After Sustained Virological Response May Cause Viral Relapse. *Pak. J. Zool.*, 47: 981-987.
28. Fiza, Y., B. A. Rakha, Shamim Akhter and M. S. Ansari. 2015. Breeding Biology of Scaly-Bellied Woodpecker, *Picus squamatus*, in Margalla Hills National Park, Pakistan. *Pakistan Journal of Zoology*. 47: 1003-1007.
29. Iqbal, M. N., Shamim Akhter, & Irfan, M. (2015). Prevalence of hernia in relation to various risk factors in Narowal, Pakistan. *SCIENCE LETTERS*, 3(1), 29-32.
30. Ansari, M. S., B. A. Rakha, S. M. H. Andrabi, N. Ullah, R. Iqbal, W. V. Holt and Shamim Akhter. 2014. Thioglycol in extender improves the post-thaw quality of buffalo (*Bubalus bubalis*) bull spermatozoa. *J. Anim. Plant. Sci.* 24: 1256-1259.
31. Shoaib, M., N. Ahmad, M. Ahmad, I. Ahmad, S. Iqbal and Shamim Akhter. 2014. Effects of Storage Duration on the Quality and DNA Integrity of Nili-Ravi Bull Spermatozoa Frozen and Stored in Liquid Nitrogen. *Pak. Vet. J.*, 34: 205-208.
32. Zia, U., M. S. Ansari, Shamim Akhter and B. A. Rakha. 2014. Breeding biology of red vented bulbul (*pycnonotus cafer*) in the area of rawalpindi/Islamabad. *J. Anim. Plant. Sci.* 24: 656-659.
33. M. S. Ansari, B. A. Rakha, R. Iqbal, Shamim Akhter. 2014. Effect of glutathione in extender on the Freezability of Sahiwal bull spermatozoa. *Pakistan Journal of Zoology*. 46: 17-21.

34. Shamim Akhter, B. A. Rakha, R. Iqbal, M. S. Ansari. 2014. Effect of bovine serum albumin on motility, plasmalemma, viability and chromatin integrity of buffalo bull spermatozoa. *Pakistan Journal of Zoology*. 46: 115-120.
35. Shamim Akhter, M. S. Ansari, B. A. Rakha, S. M. H. Andrabi, M. Qayyum and N. Ullah. 2014. Effect of Fructose in Extender on Fertility of Buffalo Semen. Short Communication. *Pakistan Journal of Zoology*. 46: 279-281.
36. Ali, M. R., M. Afzal, M. F. Khan, S.M.H.M. Naqvi and Shamim Akhtar. 2014. Dietary Protein Requirement of Giant River Catfish, *Sperata seenghala* (Sykes), Determined Using Diets of Varying Protein Level. *Pakistan Journal of Nutrition* 13: 151-156.

6. CURRICULUM VITAE

1. Personal Data

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2. Academic Qualification

Ph.D. _ Ecology (2009)
Institute of Zoology, Department of Integrative Biology and Biodiversity Research.
Universität für Bodenkultur Wien, Austria.

M.Sc. _ Zoology (2004)
University of Agriculture, Faisalabad, Pakistan.

B.Sc. _ Zoology, Botany & Geography (2002)
University of Punjab, Lahore, Pakistan.

3. Area of Specialization: Fisheries / Ecology

4. HEC approved supervisor

5. Professional Experience (Research and Teaching): 07 years

6. Fellowship/Membership of Professional Associations/Societies: 02

7. Research Projects; Completed=03; ongoing=01

8. Participation in Conferences/Workshops: 14

9. Supervision of Post-Graduate Theses: a) M.Phil: 14.

10. Publications = 04 Abstract = 05

1. Atufa Kawan, Zubair Anjum, Durr-e-Shahwar, Maratab Ali Awan and Faraz Akrim. Effect of Aquaculture Feeding Practices on Commercial Fish Farming in Rawalpindi District Pakistan. *Annual Research and Review in Biology*. 8(2): 1-10, 2015.
2. Muhammad Anjum-Zubair, Martin H. Entling, Alexander Bruckner, Thomas Drapela and Thomas Frank. Differentiation of spring carabid beetle assemblages between semi-natural habitats and adjoining winter wheat. *Agricultural and Forest Entomology*. 17, 355-365, 2015.
3. Faraz Akrim, Muhammad Siddique Awan, Tariq Mehmood, Muhammad Zubair Anjum, Siddiqa Qasim, Jehanzeb Khalid, Durr-e-Shahwar and Shaista Andleeb. Threats to Red Junglefowl (*Gallus gallus murghi*) in Deva Vatala National Park,

- District Bhimber, Azad Jammu and Kashmir, Pakistan. *Annual Research and Review in Biology*. 6(1): 59-65, 2015.
4. Siddiqa Qasim, Faraz Akrim, Jehanzeb Khalid, Adnan Arshad, Durr-e-Shahwar, Shaista Andleeb and Muhammad Zubair Anjum. Total Cholesterol and Triglycerides in Unmarried Males and Females of Azad Jammu and Kashmir, Pakistan. *Annual Research and Review in Biology*. 4(24):4084-4090, 2014.

7. CURRICULUM VITAE

1. Personal Data

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2. Academic Qualification

DEGREE	YEAR	SUBJECTS	INSTITUTIONS
Ph.D	2012	Neurobiology	Quaid-I-Azam University, Islamabad, Pakistan
M.Sc	2000	Zoology	Quaid-I-Azam University (Animal Sciences), Islamabad, Pakistan

3. Area of Specialization: Neurobiology

4. HEC approved supervisor

5. Professional Experience (Research and Teaching): 3 years

7. Research Projects; Completed=02

8. Participation in Conferences/Workshops: 2

9. Supervision of Post-Graduate Theses: a) M.Phil.: 5.

10. Publications

Papers Published in Peer Reviewed Journals:

4

Publications during reported period (2018-20)

1. Abida Arshad, Habib Ullah Khan, Farzana, Mehwish Saba Aslam, Tayyab Rehman, Muhammad Arshad,*Muhammad Saad Ahmed, Ijaz Ali and Ahmad Ur Rehman Saljoqi "Seropositivity and Active HCV Infection in Patients from Peshawar Division of Khyber Pakhtunkhwa Province, Pakistan.
2. Abida Arshad, Khaleeq-Uz-Zaman, Ijaz Ali, 4Muhammad Arshad, Muhammad Saad Ahmed 5Mukhtar Alam, Ahmad ur Rehman Saljoqi, Aqeel Javed, Naemud Din Ahmadan Zahoor Ahmad Swati "Development of Duplex PCR Assay for the Detection of Mycoplasma Gallisepticum and Mycoplasma Synoviae Prevalence in Pakistan.
3. Usman Waheed, Abida Arshad, Muhammad Arshad Malik, Hasan Abbas Zaheer "The Evolution of Medical Laboratory Technology in Pakistan.
4. Usman Waheed1*; Muneeba Azmat2 ; Muhammad Arshad3 ; Abida Arshad4 ; Hasan Abbas Zaheer1HIV/AIDS Epidemic and Global Health

8. CURRICULUM VITAE

1. Personal Data

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2. Academic Qualification

DEGREE	YEAR	SUBJECTS	INSTITUTIONS
MSc	2004	Zoology	Quaid-I-Azam University, Islamabad, Pakistan
M.Phil	2008	Cell Biology	Quaid-I-Azam University (Animal Sciences), Islamabad, Pakistan
Ph.D	2013	Biosciences	COMSATS Institute of Information Technology, Islamabad

3. Area of Specialization: Genetics

4. HEC approved supervisor

5. Professional Experience (Research and Teaching): 3 years

7. Research Projects; Completed=02

8. Participation in Conferences/Workshops: 2

9. Supervision of Post-Graduate Theses: a) M.Phil.: 5.

10. Publications

Papers Published in Peer Reviewed Journals:

7

Publications during reported period (2018-20)

1. Hassan MU, Iqbal MF, Riaz A, Zafar MA, Shamim A, Rehman SU, Kayani MFA, Baig RM. Prevalence and Chemotherapy of Warble Fly Infestation in Goat Population of District Khushab, Pakistan. Pakistan Journal of Science. Volume 68 (Issue No. 2) June 2016. 128-132.
2. Banaras F, Abbas F, Awan MA, Riaz A, Khan IA, Ahmad Z, Mengal MA, Banaras S, Hassan M, Zafar MA, Baig RM. Molecular Survey on the Prevalence of Caprine mycoplasma in the Goats of Quetta City of Pakistan. International Journal of Veterinary Science. 2016, 5(3): 158-163.

3. Wazir U, Sanders AJ, Wazir A, Baig RM, Jiang WG, Ster IC, Sharma AK, Mokbel K. Effect of the knockdown of death-associated protein 1 expression on cell adhesion, growth and migration in breast cancer cells. *Oncology Reports* 33(3):1450-8.2015.
4. Sabir M, Baig RM, Ali K, Mahjabeen I, Saeed M, Kayani MA. Retinoblastoma (RB1) pocket domain mutations and promoter 5 hyper-methylation in head and neck cancer. *Cellular Oncology*, 37 (3), 203-213. 2014
5. Ali K, Mahjabeen I, Sabir M, Baig RM, Zafeer M, Faheem M, Kayani MA. Germline Variations of Apurinic/Apyrimidinic Endonuclease 1 (APEX1) Detected in Female Breast Cancer Patients. *Asian Pac J Cancer Prev*, 15(18), 7589-95. 2014
6. Qureshi Z, Mahjabeen I, Baig RM, Kayani MA. Correlation between Selected XRCC2, XRCC3 and RAD51 Gene Polymorphisms and Primary Breast Cancer in Women in Pakistan. *Asian Pac J Cancer Prev*, 15(23): 10225-9. 2014.
7. Kayani MA, Khan S, Baig RM, Mahjabeen I. Association of RAD 51 135 G/C, 172 G/T and XRCC3 Thr241Met Gene Polymorphisms with Increased Risk of Head and Neck Cancer. *Asian Pac J Cancer Prev*, 15 (23), 10457-10462. 2014.

9. CURRICULUM VITAE

1. Personal Data

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2. Academic Qualification

DEGREE	YEAR	SUBJECTS	INSTITUTIONS
Ph.D	Cont..	Neurobiology	Pir Mehr Ali Shah Arid Agriculture University, Murree road, Rawalpindi
M.Phil.	2008	Zoology	Pir Mehr Ali Shah Arid Agriculture University, Murree road, Rawalpindi
M.Sc	2006	Zoology	Pir Mehr Ali Shah Arid Agriculture University, Murree road, Rawalpindi

3. Area of Specialization: Reproductive Endocrinology and Genetics

4. Professional Experience (Research and Teaching): 9 years

5. Research Projects; Completed=01

6. Participation in Conferences/Workshops: 3

9. Supervision of Post-Graduate Theses: a) M.Phil.: 11.

10. Publications

Papers Published in Peer Reviewed Journals:

14

Publications during reported period (2018-2020)

1. Irfan M, M Ismail, M A Beg. 2016. Association of MTHFR C677T (rs1801133) Polymorphism with Idiopathic Male Infertility in a Local Pakistani Population. Balkan Journal of Medical Genetics. 19 (1): 51-62.
2. Aisha Qayyum, Muzammil Hasan Najmi, Qaisar Mansoor, Muhammad Irfan, Abdul Khaliq Naveed, Andleeb Hanif, Ali Raza Kazmi, Muhammad Ismail: Frequency of Common VKORC1 Polymorphisms and Their Impact on Warfarin Dose Requirement in Pakistani Population. Clinical and Applied Thrombosis/Hemostasis 11/2016; 34(1).
3. Rashid N, Irfan M, M S Nadeem, A Shabbir. Comparative seasonal hematology of *Scotophilus heathi* and *Pipistrellus pipistrellus* in a subtropical area of Pakistan. Pakistan Journal of Zoology. 48 (5): 1503-1510.

4. Muhammad Naeem Iqbal, Shahzad Ali, Aftab Ahmad Anjum, Khushi Muhammad, Muhammad Asad Ali, Shihua Wang, Waseem Ahmad Khan, Iahtasham Khan, Ali Muhammad, Abid Mahmood, Muhammad Irfan, Aftab Ahmad, Asfa Ashraf, Firasat Hussain: Microbiological Risk Assessment of Packed Fruit Juices and Antibacterial Activity of Preservatives Against Bacterial Isolates. *Pakistan journal of zoology* 09/2016; 48(6).
5. Inam M, R H Shafique, M Irfan, M Ismail, S Abbas, N Roohi. 2016. Prevalence of Multiple Foods Sensitization in Pakistani Population. *Pakistan Journal of Zoology*. 48 (4): 1009-1015.
6. Inam M, R H Shafique, N Roohi, M Irfan, S Abbas and M Ismail. 2016. Prevalence of sensitization to food allergens and challenge proven food allergy in patients visiting allergy centers in Rawalpindi and Islamabad, Pakistan. *SpringerPlus*. 5: 1330. DOI: 10.1186/s40064-016-2980-0.
7. Irfan M, A Shabbir, G K Raja, A R Kiyani and M Ismail. 2015. Sperm Disorders and Aetiologies of Male Infertility in Pakistan: Meta-Analyses and Review. *Austin Journal of Reproductive Medicine & Infertility*. 2 (6): 1034.
8. Irfan M, H Nawaz, M Inam. 2014. Tears shedding may be adapted to heal physical and psychological hurting in man. *OA Medical Hypothesis*, 2 (1): 5-8
9. Irfan M, M Ismail, G K Raja, A R Kiyani. 2015. Sperm disorders and etiologies of male infertility in Pakistan: Meta analyses and Review. *Austin Journal of Reproductive Medicine and Infertility*. (Online first)
10. Iqbal M N, S Akhtar, M Irfan. 2015. Prevalence of hernia in relation to various risk factors in Narowal, Pakistan. *Science Letters*. 3 (1): 29-32
11. Ali H M, S Bhatti, S Shehzad, A Ahmad, M Irfan, A Muhammad. 2015. Mutational analysis of MD2 gene in hepatocellular carcinoma. *Science Letters*. 3 (1): 33-36
12. Iqbal M N, S Ali, M Irfan, A Muhammad, G Mujtaba. 2015. Population estimation of kites and crows by roost count method in Lahore, Pakistan. *Science Letters*. 3 (1): 29-32
13. Ali, M, S I Shah, M N Iqbal, S Ali, M Irfan, A Ahmad, M Qayyum. 2015. Prevalence of *Gigantocotyle explanatum* in buffaloes slaughtered at Sihala Abattoir, Rawalpindi. *Punjab Univ. J. Zool.*, 30(1): 11-14.
14. M N Iqbal, A A Anjum, M A Ali, F Hussain, S Ali, A Muhammad, M Irfan, A Shabbir. 2015. Assessment of Microbial Load of Un-pasteurized Fruit Juices and in Vitro Antibacterial Potential of Honey Against Bacterial Isolates; *Open Journal of Microbiology*. doi.10.2174/1874285820150601E001

10. CURRICULUM VITAE

1. Personal Data

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2. Academic Qualification

DEGREE	YEAR	SUBJECTS	INSTITUTIONS
Ph.D	2009	Zoology	Pir Mehr Ali Shah Arid Agriculture University, Murree road, Rawalpindi
M.Sc	1995	Zoology	University of the Punjab

3. Area of Specialization: Pest control

4. Professional Experience (Research and Teaching): 21 years

5. Research Projects; Completed=01

6. Participation in Conferences/Workshops: 2

9. Supervision of Post-Graduate Theses: a) M.Phil.: 12 b) 1

10. Publications

Papers Published in Peer Reviewed Journals: 8

Publications during reported period (2018-20)

1. Khanam, S., R. Howitt, M. Mushtaq and J. Russell. 2016. Diet analysis of small mammal pests: A comparison of molecular and microhistological methods. *Integ. Zool.*, 11(2): 98-110. (IF = 1.722)
2. Khan, A., M. Mushtaq, M. S. Nadeem, A. R. Kayani and I. Ahmed. 2016. Testing Aluminium Phosphide in Indian Crested Porcupine Burrows as a Pest Management Technique in Bannu, Pakistan. *Asian J. Agri. Biol.* 4(4): 85-90. (HEC Recognized)
3. Nighat, S., M. S. Nadeem, T. Mehmood, A. R. Kayani, M. Mushtaq and M. Mehmood-ul-hassan. 2016. Estimation of heavy metals in Indian flying fox *Pteropus giganteus* (Brunnich, 1782) from Punjab, Pakistan. *Pakistan. J. Zool.* 48(6): 1787-1792. (IF = 0.478)

4. Nazir, K., M. Mushtaq, M. Naeem and M. F. Nasir. 2016. A Note on Diversity of Termites in Taxila, Rawalpindi, Pakistan. *Pakistan. J. Zool.* 48(4): 1213-15. (IF = 0.478)
5. Khan, A. A., M. Mushtaq and A. M. Ghumman. 2016. Digging and Clipping Behaviour of Indian Crested Porcupine, *Hystrix indica* Kerr, 1792 in a Green Belt of Islamabad, Pakistan. *Pakistan. J. Zool.* 48(3): 817-820. (IF = 0.478).
6. Hussain, I., N. A. Qureshi, M. Anwar and M. Mushtaq. 2016. Burrow characteristics of Lesser Bandicoot Rat (*Bandicota bengalensis*) in the Agro-Ecosystem of Pothwar Plateau, Pakistan. *Pakistan J. Zool.*, 48(3): 631-638. (IF = 0.478)
7. Mushtaq, M. 2015. Effectiveness of grain based bait as carrier of Strychnine Alkaloid for the control of Indian crested porcupine, *Hystrix indica*. *Sarhad J. Agricul.* 31(1): 10-15. (HEC Recognised).
8. Mushtaq, M. A.R. Kayani, M. S. Nadeem and M. A. Beg. 2014. Distribution pattern of commensal rodents in shops of urban Rawalpindi, Pakistan. *Pakistan J. Zool.*, 46(6): 1585–1589. (IF = 0.478).