Self Assessment Report
DEPARTMENT OF Entomology

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## ANNEXURES

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Introduction

Department of Entomology was started in 1980 with the establishment of Agriculture College. In the beginning, department used to offer minor courses of Entomology for the students of B.Sc. (Hons). agriculture specializing in disciplines other than Entomology. During the year 1986, the department started B.Sc. Hons. Degree Program in Entomology. With the up gradation of College to the status of University in 1994, the department made tremendous efforts to upgrade B.Sc. Hons. Program. Consequently, M.Sc. Hons. degree program was started in 1997 and Ph.D. program was introduced during 1998. The department is committed to quality teaching and research in the area of Entomology. Mission of the department is to produce professionally skilled and academically sound entomologists to resolve the challenges relating to the insect pests infesting field crop, stored commodities, functioning as vector of plant/ animal diseases and producing useful products directly and to improve quality of the human life and economy of the country indirectly. Keeping in view its mission and objectives, the department of Entomology recurrently reviews its curriculum to meet the challenges in the field. The department is always committed to enhance students’ professional training and career opportunities. It arranges field visits and holds national and international seminars on current issues relating to the protection and quality of post-harvest etc. The faculty is actively engaged in a number of research projects some of which are funded by the Higher Education Commission, Pakistan Science Foundation etc.

The department never compromises on quality. Since the faculty has been inducted purely on merit basis, so it is committed to promote merit and improve quality of education, teaching and research. The department is always willing to cooperate with the Quality Enhancement Cell of the University as well as to incorporate their recommendations for improving standard of teaching, quality of learning and achievement of its objectives. This report reflects efforts of the department to evaluate its performance for future improvement in collaboration with the QEC. This Self Assessment Report (SAR) contains eight sections. The first section outlines the programme mission and objectives. Section 2 provides information about the curriculum development. Section 3 enlists the laboratories and other relevant information followed by student support and guidance. The last four sections provide information about student support, process control, faculty characteristics and institutional facilities and support provided by the university.
**Criterion-1: Programme Mission, Objectives and Outcomes**

The Field of Entomology deals with the protection of crop, stored grains, fruit trees and ornamental plants from the attack of insect pests. Besides the insects produce highly useful products such as silk, honey etc, so the field of Entomology is directly related with Sericulture and Apiculture industries. In case of medical discipline, entomology is playing a key role in healing of wounds by application of sterile maggots which are otherwise difficult to heal specially in diabetic patients. Likewise environmental pollution, biodiversity and insect resistance against the pesticides are the burning issues of today which warrant continuous processes of education and research. Basic and applied education to the students at graduate and post-graduate level, in this specialized field, involves the use of modern/advanced teaching methods and innovative analytical techniques for insect pest identification, monitoring, scouting, forecasting and development of control measures. Application of knowledge concerning the field of entomology not only reduces enormous losses due to insect pests, lessen pollution hazards and develop a sustainable and substantially profitable production system for the farmers.

**Standard 1-1: The program must have documented measurable objectives that support institution mission statements.**

To produce professionally skilled and academically sound entomologists to resolve the challenges relating to the insect pests infesting field crop, stored commodities which ensure to crop production as well as improved plant health, thereby help developed agricultural and industrial economy, and producing useful products directly and to improve quality of the human life and economy of the country indirectly.

**Documented measurable objectives**

The department is offering B.Sc. (Hons). M.Sc. (Hons) and Ph.D. degrees in Entomology discipline to cater highly skilled local manpower for future needs. Objectives of Entomology program are given as under.

1. To equip the graduates with necessary theoretical and practical knowledge relating to the field of Entomology and to enable them to apply this knowledge of degree program professionally and productively.
2. To train and prepare the students about application of the latest techniques of IPM (Integrated Pest Management) program, so that they may contribute in reduction of environmental pollution and uplifting of human health.

3. To ensure application of entomological knowledge in a systematic way to reduce cost incurred on plant protection techniques especially on pesticides.

4. To prepare the graduates to work in an R &D environment effectively.

5. To peruse higher studies in any international university of high repute.

6. To enable the graduates to be a good human and an efficient, job oriented and dedicated worker with a reasonable earning to lead a prosper life.

Main elements of strategic plan to achieve mission and objective

- Strengthening and implementation of a solid teaching system based on the knowledge, expertise and vision gathered from world reviews, literature, innovations, proceedings, symposia etc for the award of degree.
- Scheming and improving the curricula involving core subjects, elective subjects, field demonstrations and internship programs.
- Establishing and strengthening well equipped specialized research laboratories to conduct research.
- Post-graduate research including special problems, research reports and dissertation.
- Publication of review papers, popular articles and scientific papers in well reputed journals, editing of books and manuals etc.
- Execution of research projects funded by the universities and other agencies.
- Provocation of linkages with national and international research organizations to solve indigenous problems relating to research.

PROGRAM OBJECTIVES ASSESSMENT

The department monitoring system is focused on the lines:

- Student-Teacher interaction
- Students views for program/faculty
- Critical analysis and policy formulation for development of infrastructure
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>Improvement and intensification of Entomology at AAUR</td>
<td>Based on identification of insect pests infesting crop plants in the field and their economic importance</td>
<td>It is a regular process as per requisite</td>
<td>Techniques of guidelines are required to be improved</td>
<td>Techniques regarding research and field practices developed and dissemination to the students.</td>
</tr>
<tr>
<td>2</td>
<td>To communicate fundamental and practical knowledge to the graduate and Post-graduate students</td>
<td>Assessing the previous understanding of students through entry tests and student response</td>
<td>At the occasion of entrance into first semester</td>
<td>Various basic subjects are required to be incorporated in the syllabus</td>
<td>Improvement of courses as per requisite</td>
</tr>
<tr>
<td>3</td>
<td>Supervision of students in research / internship</td>
<td>Evaluating the attention of students through their opinions</td>
<td>Prior to initiate the projects</td>
<td>Students to deliver seminars and prepare reports</td>
<td>Seminars, presentation sessions and class discussions, were organized for communication proficiency improvement</td>
</tr>
<tr>
<td>4</td>
<td>Incorporation of associated fields</td>
<td>Through entry tests, interviews research own interest</td>
<td>Topics / curriculum attachment previous to start</td>
<td>Allied topics to be suggested</td>
<td>Development of awareness and exposure regarding the field</td>
</tr>
<tr>
<td>5</td>
<td>Foresee the new lines of education and areas of research</td>
<td>Through surveillance of crop pests, judging manpower, communication to evaluate farmers opinions</td>
<td>Regular feature</td>
<td>Latest subjects should be incorporated in syllabus, to study the new challenges</td>
<td>Endorsement of new syllabus to incorporate modern techniques</td>
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Standard 1-2: The program must have documented outcomes for graduating students. It must be documented that the outcomes support the program objectives and that graduating students are capable of performing these outcomes.

Expected Outcomes of the Programme:

1. The students should have an aptitude toward understanding the importance of entomology, crop protection, insect pest problem, environmental pollution and health hazards caused by pesticides.
2. The graduates should have ability to differentiate the harmful and beneficial insects as well as to apply knowledge of IPM for their control.
3. The students should have ample capacity to analyze the pest problem and to recommend an insecticide suitable for the situation keeping in view cost effectiveness and environmental safety.
4. The graduate students must have capability to take up small scale research on some problem which they come across during their course of duty; whereas postgraduate and doctoral students will be capable of conducting advanced level research on the problems relating to Entomological field.

5. The students shall gain advanced theoretical and practical knowledge enabling them to peruse for higher studies.

6. The graduates shall be capable to establish their own enterprises and business using their skills such as silkworm production, honey production, sterile maggot production, mass scale production of predators and parasites.

7. The students shall have potential to contribute in national economy and development through their research projects.

Relationship between programme outcomes and objectives are given in table 2.

**Table 2** Programme outcomes and their relationship with the Programme objectives

<table>
<thead>
<tr>
<th>Objectives</th>
<th>1</th>
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<th>4</th>
<th>5</th>
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+ = Moderately satisfactory
++ = Satisfactory
+++ = Highly satisfactory
Programme Outcome Measurement

For programme’s evaluation, especially from point view of achievements of objectives; assessment was made through prescribed proforma provided by the Quality Enhancement Cell of Pir Mehr Ali Shah, Arid Agriculture University. This Performa was filled in by students, faculty, alumni, field organizations, research institutes, research centres and agriculture departments as the graduates of Entomology department are mostly working in these institutions.

PROGRAM ASSESSMENT RESULTS

Teachers’ Evaluation

Teachers’ performance was assessed through students’ comments on prescribed evaluation performa. This evaluation was done for different courses of the individual teachers filling in Proforma 10 (Annexure-IV). There are 4 teacher in the department which are numbered 1-4 with monitoring there names, Prof. Dr. Muhammad Aslam, Dr. Muhammad Naeem, Mr. Humayun Javed and Mr. Muhammad Tariq. The results showed that the teacher 1 is on top scoring 4.73. The lowest performance with a score of 4.42 was observed in case of teacher 4.

Teacher Evaluation Form

Figure: Performance level of different teachers in Entomology Department
Pie Charts Showing Teacher Evaluation

**Teacher 1**

The individual graphs reflected excellent performance of the teacher in all respects. However, 7.10% students complained that the instructors do not show respect towards students and do not encourage the class participation.

- **The instructor is prepared for each class:**
  - The chart shows 86% SA, 14% A, and 0% for the other categories.

- **The instructor demonstrates knowledge of the subject:**
  - The chart shows 93% SA, 0% A, and 0% for the other categories.

- **The instructor has completed the whole course:**
  - The chart shows 93% SA, 7.1% A, and 0% for the other categories.

- **The instructor provides additional material apart from text:**
  - The chart shows 86% SA, 14% A, and 0% for the other categories.

- **The instructor gives citations regarding current situations with reference to Pakistani context:**
  - The chart shows 64% SA, 36% A, and 0% for the other categories.

- **The instructor communicates the subject matter effectively:**
  - The chart shows 71% SA, 29% A, and 0% for the other categories.
The instructor shows the respect towards students and encourages class participation

The instructor maintains an environment that is conducive to learning

The instructor arrives on time

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.

SA: Strongly Agree  A: Agree  UC: Uncertain  D: Disagree  SD: Strongly Disagree
**Teacher 2**  Evaluation results showed very good performance of the teacher. Almost 79% of the students stated that the teacher used to provide them extra material apart from text. Besides, 67% students reported that the teacher gives the current citation about the problems relating to Pakistan.
The instructor shows the respect towards students and encourages class participation

The instructor maintains an environment that is conducive to learning

The instructor arrives on time

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.
Teacher 3  Analyses of the proformae revealed good performance of the teacher except some students (7.1 %) were not satisfied with the fairness in marking and 6.6% reported unsatisfied level of students’ respect by the teacher.

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 gives citations regarding current situations with reference to Pakistani context

The instructor communicates the subject matter effectively
The instructor shows the respect towards students and encourages class participation

The instructor maintains an environment that is conducive to learning

The instructor arrives on time

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.
Teacher 4  The pie charts indicated that overall performance of the teacher was good. However some students (7.1%) reported that the course was not updated and did not depict citations from Pakistani point of view. Few students were doubtful about the fairness of the teacher in examination.
The instructor shows the respect towards students and encourages class participation

The instructor maintains an environment that is conducive to learning

The instructor arrives on time

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.
Students Course Evaluation

The courses of the individual teachers were evaluated on the basis of information gathered from Proforma 1 (Annexure-III). There are 3 teachers which are numbered 1-3 with monitoring their names, Dr. Muhammad Naeem, Mr. Humayun Javed and Prof. Dr. Abdul Khaliq (Late). The performance level is graphically presented in the figure as shown under. Results showed that the course taught by Teacher No. 1 gathered maximum score (4.32).
Pie Charts Showing Student Course Evaluation

Course ENT 502 (Teacher 1)
About 61 to 69% students revealed that the course objectives were clear, course work was manageable and the course was well organized. However, the students were not satisfied about the level of their own attendance. That is why the level of students participation was found to be only 37% and about 56% students pointed out that they made progress in the course. 21% students were not satisfied with class room environment.
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.

The pace of the course was appropriate

Ideas and concepts were presented clearly

The method of assessment were reasonable
Feedback on assessment was timely

- 43%
- 50%
- 7%
- 0%
- 0%

Feedback on assessment was helpful

- 50%
- 43%
- 7%
- 0%
- 0%

I understood the lectures

- 36%
- 7%
- 0%
- 0%
- 57%

The material was well organized and presented

- 29%
- 14%
- 0%
- 0%
- 57%

The instructor was responsive to student needs and problems

- 29%
- 71%

Had the instructor been regular throughout the course?

- 79%
- 21%
- 0%
- 0%
- 0%
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.
Course ENT 510 (Teacher 2)
A majority of the students ranging 71 to 79 % disclosed that the course objectives were clear, course work was manageable and the course was well organized. However 42 % students were not satisfied with the level of their own attendance. That is why 43 % students strongly affirmed that they made progress into the course inspite of their active participation to the extent of 64 %. 21 % students were not satisfied with class room environment.
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.

- 43% agree
- 36% neutral
- 7% disagree
- 14% strongly disagree
- 0% strongly agree

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

- 43% agree
- 36% neutral
- 7% disagree
- 14% strongly disagree
- 0% strongly agree

The course stimulated interest and thought on the subject area.

- 50% agree
- 50% neutral
- 0% disagree
- 0% strongly disagree
- 0% strongly agree

The pace of the course was appropriate

- 64% agree
- 36% neutral
- 0% disagree
- 0% strongly disagree
- 0% strongly agree

Ideas and concepts were presented clearly

- 64% agree
- 36% neutral
- 0% disagree
- 0% strongly disagree
- 0% strongly agree

The method of assessment were reasonable

- 54% agree
- 38% neutral
- 8% disagree
- 0% strongly disagree
- 0% strongly agree
Feedback on assessment was timely

- 54% (S.A)
- 46% (A)

Feedback on assessment was helpful

- 62% (S.A)
- 38% (A)

I understood the lectures

- 50% (S.A)
- 50% (A)

The material was well organized and presented

- 57% (S.A)
- 43% (A)

The instructor was responsive to student needs and problems

- 69% (S.A)
- 31% (A)

Had the instructor been regular throughout the course?

- 69% (S.A)
- 23% (A)
The material in the tutorials was useful

50% 7%
36% 7%
0% 0%

I was happy with the amount of work needed for tutorials.

57% 7%
43% 0%
0% 0%
0% 0%

The tutor dealt effectively with my problems

57% 43%
0% 0%
0% 0%
0% 0%

The materials in practical was useful

57% 43%
0% 0%

The demonstrators dealt effectively with my problems.

57% 43%
0% 0%
Course ENT 713 (Teacher 3)
Although 66% students were of the view that course objectives were clear but only 33% students strongly agreed that the course work was manageable and the course was well organized. Similar percentage of the students strongly agreed that the course was well conducted and teaching methods encouraged their participation.
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 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

- 50% Satisfactory
- 33% Average
- 17% Below Average
- 0% Unsatisfactory
- 0% Not Calculated

Feedback on assessment was helpful

- 50% Satisfactory
- 33% Average
- 17% Below Average
- 0% Unsatisfactory
- 0% Not Calculated

I understood the lectures

- 67% Satisfactory
- 33% Average
- 0% Below Average
- 0% Unsatisfactory
- 0% Not Calculated

The material was well organized and presented

- 50% Satisfactory
- 50% Average
- 0% Below Average
- 0% Unsatisfactory
- 0% Not Calculated

The instructor was responsive to student needs and problems

- 83% Satisfactory
- 17% Average
- 0% Below Average
- 0% Unsatisfactory
- 0% Not Calculated

Had the instructor been regular throughout the course?

- 50% Satisfactory
- 50% Average
- 0% Below Average
- 0% Unsatisfactory
- 0% Not Calculated
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.
Course ENT 506 (Teacher 4)
About 64% students strongly agreed that course objectives were clear. But only 21% students strongly agreed that the course work was manageable. Likewise 57% did not strongly agree that the course was well organized. Whereas 50% of the students agreed that they participated actively and made progress in the course. Most of the students were not satisfied with the overall environment of class. Only 21% agreed that class room were satisfactory.
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.

- 65%
- 14%
- 7%
- 7%
- 7%

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

- 42%
- 25%
- 8%
- 8%
- 17%

The course stimulated by interest and thought on the subject area.

- 64%
- 29%
- 0%
- 7%
- 0%

The pace of the course was appropriate

- 50%
- 44%
- 6%
- 0%
- 0%

Ideas and concepts were presented clearly

- 64%
- 29%
- 0%
- 7%
- 0%

The method of assessment were reasonable

- 79%
- 7%
- 0%
- 0%
- 14%
Feedback on assessment was timely

- 36% S.A
- 50% A
- 14% UC
- 0% D
- 0% S.D

Feedback on assessment was helpful

- 23% S.A
- 54% A
- 0% UC
- 0% D
- 0% S.D

I understood the lectures

- 64% S.A
- 29% A
- 0% UC
- 7% D
- 0% S.D

The material was well organized and presented

- 36% S.A
- 57% A
- 0% UC
- 7% D
- 0% S.D

The instructor was responsive to student needs and problems

- 64% S.A
- 29% A
- 0% UC
- 0% D
- 0% S.D

Had the instructor been regular throughout the course?

- 100% S.A
- 0% A
- 0% UC
- 0% D
- 0% S.D
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.
ALUMINI SURVEY

The alumni survey results was conducted associated with Proforma # 7 (Annexure-I). Six graduate students feedback was obtained from the Alumni survey. The programme assessment results are shown in the following pie graphs.
Skills and Capabilities Reflected In Performance as Entomologist.

Our students develop ability to apply knowledge of Entomology to work as skilled and successful professionals in the respective field. While studying, students learn advance knowledge about the field, gain confidence, experience and skills to handle problems relating to their field of specialization independently as well as working in a team of experts.

SURVEY OF GRADUATING STUDENTS

The survey of graduate students results was conducted associated with around 20 graduate students of Proforma # 3 (Annexure-II). The programme assessment results are shown in the following pie graphs. It is evident from the charts that majority of the students were satisfied with the programme. However few students were dissatisfied with the environment, contents of the curriculum and team work abilities.
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 been fully achieved

Whether the contents of the curriculum are advanced and meet program objectives

Faculty was able to meet the program objectives
Internship Experience:

The results of internship experience was found to be satisfied which help to improve the ability to work in teams, discipline, professional development, time management skills and appreciation of esthetic values. Around 50% students showed their satisfaction considering all the parameter as represent under the figure.
Standard 1-3: The results of Program’s assessment and the extent to which they are used to improve the program must be documented.

Strength of the Department
The department hold meeting during or at the end of semester to discuss performance, attitude and regularity of the students. The main strength of the department is the urge and desire to promote the entomological knowledge and research to solve the field problems relating to crop pests, systematics, food security and economic entomology. At present two of the senior faculty members are foreign Ph.Ds, whereas three junior faculty members are doing Ph.D. abroad. It is hoped that on their return the department will be capable to touch the peaks of success in research and teaching methodologies.

Weakness Identified In the Program
The department is facing acute shortage of:

- Lab equipments i.e., Electron microscope, Microtome, Growth chambers etc.
- Shortage of funds for chemicals and glassware
- Shortage of staff and lack of temperature and humidity controlled laboratories; multimedia, computers and equipments relating to molecular techniques are deficient areas.

Standard 1-4: The department must assess its overall performance periodically using quantifiable measures

Present Performance Measures for Research Activities
Table 3 Research Performance of the Faculty

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Journal Publications (National &amp; International)</th>
<th>Conference Publications (Proceedings Abstract)</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Muhammad Aslam</td>
<td>113</td>
<td>41</td>
<td>3</td>
</tr>
<tr>
<td>Dr. Muhammad Naeem</td>
<td>21</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Mr. Humayun Javed</td>
<td>13</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

The department is under staffed and need more Ph.Ds to be inducted.

Faculty with Excellent Research Award

- PEF 8th National Education Award, 2002.
Quid-i-Azam Gold Medal, 2004

(Prof. Dr. Muhammad Aslam, Chairman Entomology Department was honored with these awards).

Community Services by the Department

- Workshop on “Controlled and modified atmospheres to preserve post-harvest quality of stored grains”

Faculty Satisfaction Regarding the Administrative Services

- Department regularly participate/attend all periodical/scheduled meetings including departmental, university, academic council, and syndicate).
- Corresponding to the HEC standards Entomology Department maintains a ratio of 8:3 for the academic (technical) and administrative (non-technical) staff.
- All sorts of records/inventories pertaining to personnel, students, results or thesis etc have been maintained in a regular and proper way.
- A good level of regularity has been maintained in quick office disposal, so far no complaint has been lodged from any quarter in this regard.

Major Future Improvement Plans

Thanks to industrialization, we are no more an agriculture-dependent economy only. However, a sizeable portion of our industry is agriculture-based. Crop protection and improved plant health for higher yields will always be among the prime objectives for the country.

In the light of faculty performance evaluation and monitoring surveys, the department is paying special attention on:

- Maintaining better learning environment and standards of teaching.
- Rescheduling field visits incorporating entomological problems particularly in arid areas.
- To impart quality education in Entomology through audio visual aids and modern tools along with provision of latest literature, journals, books, reviews and access to internet.
- To extend facilities for studying crops and stored grain insect pests, and develop extension material.
- To prepare hand outs, brochures and pamphlets for the farmers and advisory services.
- To establish the post-graduate laboratories in the disciplines of Toxicology, Biosystematics, sericulture and apiculture and Bio-control along with strengthening of
Stored grain research laboratories. Human Resource development in Plant Pathology to meet future challenges for sustainable agriculture leading to self sufficiency in food.

- To emphasize problem oriented research on specific and serious crop pests prevalent in the arid ecology.
- Overall enhancement of knowledge and skills of faculty members in relation to the latest global advancements in this discipline through exchange programs, short term trainings and collaborative research projects with federal and provincial government bodies.

### Table: 4 Quantitative Assessment of the Department

<table>
<thead>
<tr>
<th>Sr.#</th>
<th>Particular</th>
<th>No.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Undergraduates B.Sc. (Hons.) produced</td>
<td>29</td>
<td>Some of the students are silver medalist, 80% of them joined M.Sc, 35% got employment</td>
</tr>
<tr>
<td>ii</td>
<td>M.Sc. (Hons.) degree awarded</td>
<td>18</td>
<td>3 students joined PhD program; the remaining got employment, currently holding various positions</td>
</tr>
<tr>
<td>iii</td>
<td>Ph.D. produced</td>
<td>5</td>
<td>In employment</td>
</tr>
<tr>
<td>iv</td>
<td>Post-Doc fellowship</td>
<td>1</td>
<td>UK</td>
</tr>
<tr>
<td>v</td>
<td>Ph.D. Scholarship for faculty</td>
<td>3</td>
<td>One for Netherland; 2 for UK.</td>
</tr>
<tr>
<td>vi</td>
<td>Students: Faculty rates</td>
<td>37:1</td>
<td>Fulfils HEC criteria</td>
</tr>
<tr>
<td>vii</td>
<td>Technical: Non Technical ratio</td>
<td>8:3</td>
<td>Fulfils HEC criteria</td>
</tr>
<tr>
<td>viii</td>
<td>Average grade point</td>
<td>Around 3</td>
<td>Fulfils HEC criteria</td>
</tr>
</tbody>
</table>

The assessment exhibited high efficiency of system and adequate impact of outcomes. Almost all the graduates and post graduates got jobs in various organizations (Federal & provincial departments, universities, research organizations, banks NGOs, pesticide companies etc.).

**Degree**

- B.Sc. (Hons) Agric. Entomology
- M.Sc. (Hons) Agric. Entomology
- Ph.D. Entomology

**Pre-requisites**

- B.Sc. (Hons) Agric. with Entomology as major subject, entry test
- M.Sc. (Hons) Agric. in Entomology, Entry test, Interview
Employer Survey:

Employer survey for the determination of student skills was conducted from the different organization from proforma 8 (Annexure 8). Survey shows that our graduates are fall above average in all areas except communication skills. The weakness of communication skills will be tried to improve for our current and future students.

![Graph showing skills level]

The most of the employers were satisfied with potential of our students in handling entomological problems independently. Performance of our students was appreciated by the employers. Some employers suggested that students should be given opportunity to take up courses on communication skills before they are awarded degrees. Besides some office management courses have also been suggested to be included in the curricula.

![Pie figures showing overall results]

Pie figures shows that the overall results of employer survey were assessed. More than 80% were considered to be very good in knowledge, communication skills shows that 40% agree both in excellent and very good, 55% observed considered to be very good in interpersonal skills.
Interpersonal skills

- Excellent: 0%
- Very good: 6%
- Good: 22%
- Fair: 17%
- Poor: 55%

Work skills

- Excellent: 0%
- Very good: 33%
- Good: 67%
- Fair: 0%
- Poor: 0%
CRITERION 2: CURRICULUM DESIGN AND ORGANIZATION

Degree Title: B.Sc (Hons) Agriculture, Majoring Entomology and M.Sc (Hons) in Entomology

Intent: All the courses for degree program were developed by a committee constituted by the Higher Education Commission, Pakistan. The committee consists of experts and learned professors, subject matter specialists from the Universities and research organization from Pakistan. When and if needed, curriculum for the Department of Entomology is revised/updated through different bodies. At department level Board of Studies, which is comprised of senior faculty members, is responsible for updating the curriculum. This body is authorised to formulate syllabus and course content. The chairman of the Department is the convener of this body. The courses are then sent to the Board of Faculty for approval. The Dean of the Faculty, who is also the Convener, conducts the meeting. As per University Rules, after the approval of courses from the Faculty Board, these are placed before the University Academic Council for their approval. Final approval of all the courses is accorded by the University Syndicate for implementation.

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. Duration of a semester is 18 Weeks.

DEGREE PLAN

Presently three degree programs are organized by the department

B.Sc. (Hons.) Agric. Majoring in Entomology: The B.Sc. (Hons) degree programme consists of 4 academic years/8 semesters. As a whole a student has to study 52 credit hours of theory of the total 155 credit hours. out of this, 10% marks are assigned for evaluation through assignments, test and exercises by the concerned teacher and the remaining 90% marks from the theory part has been assigned for Mid and Final examinations as per University examination rules. In total B.Sc. (Hons.) Entomology degree requirement is 211 credit hours (101 theory + 110 practical) including 30 credit hours for internship. Degrees are awarded after completing the required number of credit hours (courses) following by internship report and its presentation.
M.Sc. (Hons) Entomology

M.Sc (Hons) degree programme consists of 2 academic years/4 semesters. As a whole a student has to study 45 credit comprising 35 credits of course work and 10 credits of research thesis. Concerning course work, 10% marks from theory part have been assigned for evaluation through assignments, test and exercises by the concerned teacher and the remaining 90% marks for Mid and Final examination as per University examination rules. Degrees are awarded after completing the required number of credit hours (courses) followed by internship report and its presentation. During M.Sc. degree course students are required to take up research and to write up thesis which is evaluated by the external examiner who is expert in the respective field and should be a Pakistani national.

Ph.D. Entomology

The Ph.D. programme was initiated in 1998. At present department has two Ph.D. faculty members. Whereas four teachers are continuing their Ph.Ds. The department has produced 5 Ph.Ds. Whereas 15 students are currently enrolled in the Ph.D. programme. The department is strictly following HEC instructions and guidelines in relation to admission, examination and performance evaluation of Ph.D. students.

- **Curriculum course requirements for B.Sc. (Hons) Entomology degree is summarized below**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ent-301</td>
<td>Introductory Entomology</td>
<td>4(3-2)</td>
</tr>
<tr>
<td>Ent-302</td>
<td>Applied Entomology</td>
<td>4(3-2)</td>
</tr>
<tr>
<td>Ent-501</td>
<td>Insect Morphology</td>
<td>4(3-2)</td>
</tr>
<tr>
<td>Ent-502</td>
<td>Insect Physiology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-503</td>
<td>Insect Taxonomy</td>
<td>4(2-4)</td>
</tr>
<tr>
<td>Ent-504</td>
<td>Agricultural Pests</td>
<td>4(2-4)</td>
</tr>
<tr>
<td>Ent-505</td>
<td>Plant Resistance to Insect Pests</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-506</td>
<td>Classification of Adult Insects</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-507</td>
<td>Beneficial Insects</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-508</td>
<td>Stored Product Entomology</td>
<td>2(1-2)</td>
</tr>
<tr>
<td>Ent-509</td>
<td>Household Insect Pests</td>
<td>2(1-2)</td>
</tr>
<tr>
<td>Ent-510</td>
<td>Range and Forest Entomology</td>
<td>2(1-2)</td>
</tr>
<tr>
<td>Ent-601</td>
<td>Pest Forecasting and Management</td>
<td>4(2-4)</td>
</tr>
<tr>
<td>Ent-602</td>
<td>Internship</td>
<td>20(0-40)</td>
</tr>
<tr>
<td>Ent-603</td>
<td>Insect Ecology and Behaviour</td>
<td>4(3-2)</td>
</tr>
<tr>
<td>Ent-605</td>
<td>Insecticides and Their Application</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-607</td>
<td>Insect Natural History</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-609</td>
<td>Project Planning and Presentation</td>
<td>2(1-2)</td>
</tr>
<tr>
<td>Ent-611</td>
<td>Agriculture &amp; Environmental Pollution</td>
<td>3(2-2)</td>
</tr>
</tbody>
</table>
Curriculum course requirements for M.Sc. (Hons) Entomology degree is summarized below.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ent-701</td>
<td>Research Methods in Entomology</td>
<td>4(1-6)</td>
</tr>
<tr>
<td>Ent-702</td>
<td>Environmental Entomology</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>Ent-703</td>
<td>Advanced Insect Physiology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-704</td>
<td>Microanatomy and Histology of insects</td>
<td>2(0-4)</td>
</tr>
<tr>
<td>Ent-705</td>
<td>Advanced Forest Entomology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-706</td>
<td>Insects of Man and Animals</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-707</td>
<td>Classification of Immature Insects</td>
<td>4(2-4)</td>
</tr>
<tr>
<td>Ent-708</td>
<td>Insect Pest Management systems</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-709</td>
<td>Advances in Host Plant Resistance</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-710</td>
<td>Insect Toxicology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-711</td>
<td>Insects in Relation to Plant Diseases</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-712</td>
<td>Insect Cytogenetics</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-713</td>
<td>Insect Pathology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-714</td>
<td>Insect Biochemistry</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-715</td>
<td>Comparative Insect Embryology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-716</td>
<td>Biological Control of Insect pests</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>Ent-719</td>
<td>Special Problem</td>
<td>1(1-0)</td>
</tr>
<tr>
<td>Ent-720</td>
<td>SEMINAR</td>
<td>1(1-0)</td>
</tr>
</tbody>
</table>

Curriculum course requirements for Ph.D. Entomology degree is summarized below.

Ph.D Course work includes two taught courses as well as two seminar in major subjects as well as three from other departments as minor courses i.e. Biochemistry, Statistics and Agronomy to broaden the knowledge base of the students. The Ph.D. students are required to defend synopsis at the faculty level. Evaluation of Ph.D. dissertation is accomplished externally by two foreign examiners from the technically advanced countries.
Standard 2-1: The curriculum must be consistent and support the program’s documented objectives.

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

Table 5  Courses Taught during the semester Versus Outcome

<table>
<thead>
<tr>
<th>Course/ Groups of courses</th>
<th>Out comes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Ent-301, Ent-302, Ent-510, Ent-601, Ent-602, Ent-603, Ent-501,</td>
<td>+++</td>
</tr>
<tr>
<td>Ent-507, Ent-508, Ent-509, Ent-605, Ent-607, Ent-609, Ent-611,</td>
<td>+++</td>
</tr>
<tr>
<td>Ent-710, Ent-711, Ent-712, Ent-713, Ent-714, Ent-502, Ent-503,</td>
<td>+++</td>
</tr>
</tbody>
</table>

+ = Relevant
++ = Relevant & satisfactory
+++ = Very relevant & Very satisfactory
++++ = Highly relevant & Highly satisfactory

- The curriculum fits very well and satisfies the core requirements for the program, as specified the respective accreditation body.
- The curriculum satisfied the general arts and professional and other discipline required for the program according to demands and requirements set by the Higher Education Commission.
Standard 2-2: Theoretical backgrounds, problem analysis and solution design must be stressed within the program’s core material.

Table 6 Programme Courses corresponding to theoretical background, problem analysis and solution design.

<table>
<thead>
<tr>
<th>Elements</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical backgrounds</td>
<td>Ent-301, Ent-302, Ent-510, Ent-601, Ent-602, Ent-603, Ent-501, Ent-710, Ent-711, Ent-712,</td>
</tr>
</tbody>
</table>

All these seven courses were offered during the semester (reporting period).

Standard 2-6: Information Technology Component of the Curriculum Must Be Integrated Throughout The Program:

While the curriculum was prepared, all aspects of information technology were considered and after a critical analysis, relevant aspects were integrated into the program as:

- Three computer and I.T. courses (6 credit hours) and two courses of statistics (6 credit hours) based on computer practical usage were included in the curriculum to fulfill the I.T. requirements for the students of B.Sc. (Hons) Agric. degree.
- Computer and I.T. courses (3 credit hours) have been integrated in the curriculum of M.Sc (Hons) and Ph.D students which fulfill the requirements of I.T.

Standard- 2.7: Oral and written communication skills of the student must be developed and applied in the program.

- To develop communication skills of the students a course of 3 credit hours entitled “developing communication skills” have been integrated in in the curriculum of level.
- At post-graduate level, delivering two seminars (of one credit hour each) have been made compulsory for each student.
- Students of BSc (Hons) Agriculture, MSc (Hons) and Ph.D are assigned presentations and group works during different courses which are presented in the class to develop and enhance their written and oral communication and motivation skills.

**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><strong>Entomology</strong></td>
</tr>
<tr>
<td>1.1</td>
<td>Name of Faculty</td>
<td><strong>FC&amp;FS</strong></td>
</tr>
<tr>
<td>1.2</td>
<td>Date of imitation of Ph.D. program</td>
<td><strong>1998</strong></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 Computer available per Ph.D. student</td>
<td><strong>3</strong></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>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Name of faculty members holding Ph.D. degree in the department</td>
<td><strong>3</strong></td>
</tr>
<tr>
<td>2.1</td>
<td>Number of HEC approved Ph.D. Advisors in the department</td>
<td><strong>1</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Research output:</th>
<th></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>
<td><strong>2</strong></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>
<td><strong>5</strong></td>
</tr>
<tr>
<td>3.2</td>
<td>Total number of ongoing research projects in the department funded by different organizations</td>
<td><strong>1+2</strong></td>
</tr>
<tr>
<td>3.3</td>
<td>Number of post-graduate students in the department holding scholarships/fellowships</td>
<td><strong>3</strong></td>
</tr>
<tr>
<td>3.4</td>
<td>Total Research Funds available to the Department from all sources</td>
<td><strong>More than 20 millions</strong></td>
</tr>
<tr>
<td>3.5</td>
<td>Number of active international linkages involving exchange of researchers/students/faculty etc. (Attach Details)</td>
<td>-</td>
</tr>
<tr>
<td>3.6</td>
<td>Number of Ph.D degrees conferred to date to students from the department during the past three academic years</td>
<td><strong>5</strong></td>
</tr>
<tr>
<td>4</td>
<td>Number of Ph.D students currently enrolled in the department</td>
<td><strong>13</strong></td>
</tr>
<tr>
<td>4.1</td>
<td>Ratio of number of students accepted to total number of applicants for Ph.D. program</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Program information</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------------------------------</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.Sc. (Hons) Entomology (CGPA 3)</td>
</tr>
<tr>
<td>5.2</td>
<td>Is your Ph.D program based on research only/ (Y/N)</td>
<td>No</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>
<td>5</td>
</tr>
<tr>
<td>5.4</td>
<td>Total number of post M.Sc. (16 year equivalent) courses required for Ph.D</td>
<td>18 credit hrs</td>
</tr>
<tr>
<td>5.5</td>
<td>Total number of M.Phil level courses taught on average in a term/semester</td>
<td>-</td>
</tr>
<tr>
<td>5.6</td>
<td>Total number of Ph.D. level courses taught on average in a term/semester</td>
<td>-</td>
</tr>
<tr>
<td>5.7</td>
<td>Do your students have to take/write</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Ph.D. Qualifying examination (Y/N)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>b. Comprehensive examination (Y/N)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>c. Research paper in HEC approved journal</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>d. Any other examination (Y/N)</td>
<td>-</td>
</tr>
<tr>
<td>5.8</td>
<td>Total number of international examiners to which the Ph.D. dissertation is sent</td>
<td>Two</td>
</tr>
<tr>
<td>5.9</td>
<td>How is the selection of an examiner from technologically advanced countries carried out?</td>
<td>-</td>
</tr>
<tr>
<td>5.10</td>
<td>Is there a minimum residency requirement (on campus) for award of Ph.D. degree?</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Additional information</td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>Any other information that you would like to provide</td>
<td>-</td>
</tr>
</tbody>
</table>
CRITERION 3: LABORATORIES AND COMPUTER FACILITIES

There are three laboratories in the department. The facilities and shortcomings of these laboratories are listed as under.

- **Laboratory Title:** Entomology Laboratories for the Under-graduate and Post-graduate students.
- **Location and Area:** Faculty of Crop and Food Sciences, A-Block, 2nd Floor, Main Campus
- **Objectives:** Laboratories are used for:
  - Practicle exercise and demonstrations to graduate students in their introductory and major courses.
  - Research work for the graduate and post-graduate students.
  - Used for execution of the research/development projects funded by HEC, PSF, PARC, and other national and international agencies/institutions.

**Future Need**

- More spacious and well equipped laboratories to fulfill the contemporary level of research/education are necessitated for better output.

**Standard-3.1: Laboratory manuals/documentation/instructions for experiments must be available and edaily accessible to faculty and students**

Laboratory manuals are not available. The department library has not all the relevant books. However, individual teachers have their books. The laboratories are not spacious and inadequate. The equipments are out date and out of order. Equipments regards molecular approaches are lacking e.g. Stereoscope, centrifuge (slow and ultr), PAG-Electrophoresis apparition, PCR Spectrophotometer, NPLC, relevant software, chemicals and biochemicals.

**Standard-3.2: There must be support personal for instruction and maintaining the laboratories.**

Laboratories are maintained by only one laboratory assistant (equipment, glassware, chemicals, material etc). Three laboratories attendant assist the students in practicals, cleaning and washing.
Standard-3.3: The University computing infrastructure and facilities must be adequate to support program’s objectives.

- To upgrade the prevailing education facilities, separate class rooms are needed as presently classes (lectures) are taken in laboratories.

- Space limitation is a major constraint as department could not initiated some of the major subjects like apiculture, sericulture, host plant resistance and biological control research activities.
  
  o **Computing facilities support:** Not available to all faculty members and the post graduate students.
  
  o **Shortcoming in computing infrastructure:** Computers with internet facilities should be available to all faculty members and postgraduate students.
  
  o **Safety Arrangements:** There is no proper safety arrangements and no security plan are in place in case of emergency. The department is located on the 2nd floor, there is no emergency exits for the labs. No fire extinguishers have been installed in any laboratory. No first aid kits/facilities provided in the laboratories/department.
CRITERION 4: STUDENT SUPPORT AND ADVISING

To resolve students’ issues regarding provision of guidance and information in various social and educational matters, Directorate of Students Affairs provides an effective support. University organizes various cultural activities and study tours/visits to broaden the students knowledge and experience to be utilized in their practical life.

Standard-4.1: Courses must be offered with sufficient frequency and number for students to complete the program in a timely manner

- Corresponding to the HEC guidelines and Academic Council’s recommendations regarding schemes of study, all the courses are offered accordingly at graduate level. Though at Masters level all the courses are offered as per the above mentioned approvals/guidelines of the authorities but depend upon the availability of teachers and facilities.
- All the courses (number and type) are taught as per the HEC criterion/standard.
- To meet the human resource needs in public and private sector at national level, the post-graduate level courses are tailored accordingly.

Standard-4.2: Courses in the major area of study must be structured to ensure effective interaction between students, faculty and teaching assistants.

All of the courses are designed / tailored to address the teaching needs in an effective way. In this regard teaching staff and students are consulted periodically to get the feedback for further improvement. Along with theoretical aspects of the courses, practical work is also done in field/laboratories while students are also oriented to tackle their professional needs through different assignments and submission of reports. They are coupled with various institutions/organization to get updated knowledge and insight addressing their future needs.

In this regard

- Keeping in view the feedback from students and teachers, courses are structured and updated in the board of study meeting.
• It is common and general practice to maintain an effective interaction between students and faculty and inter and intra classes of the students.

Standard-4.3: Guidance on how to complete the program must be available to all students and access to qualified advising must be available to make course decisions and career choices.

Students are guided properly in relation to their on-going educational programs at university and also focusing their future needs.

- Entomology department has developed full harmony among the faculty members and students especially the post-graduate ones. Management has made all sorts of efforts to update their knowledge and information source.
- Students are informed about the program requirement through the office of the head of the department.
- Their information records related to their studies are regularly updated through teacher–student interaction.
- Directorate of Placement Bureau also helps in communicating and exploring jobs for the university students.
CRITERION 5: PROCESS CONTROL

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

Standard-5.1: The process by which students are admitted to the program must be based on quantitative and qualitative criteria and clearly documented. This process must be periodically evaluated to ensure that it is meeting its objectives.

- A well established admission system works at university/department level. This is followed as per the rules and regulations set by the university. Admissions for different degree courses are properly advertised in the newspapers having national level circulation.
- Admission criteria for different degree courses are described in definite terms by the university and admission system is based upon the recommendations of supervisory committee.
- Prior to the admission process, criterion for admission is revised every year as a regular process.

Standard-5.2: The process by which students are registered in the program and monitoring of students progress to ensure timely completion of the program must be documented. This process must be periodically evaluated to ensure that it is meeting its objectives.

- Registration of students is done once in a degree course but evaluation is done a number of times through different examination stages. Successful completion of one semester ensures the promotion to the next semester.
- Recommendations regarding admission process for different departments are forwarded to the Registrar office for their formal registration as university student.
- On successful completion of 4th semester, graduate students are allotted major courses by the Dean Faculty of FC & FS.
- Admission merit based upon marks percentages of previous and entry test exams etc.
Standard 5.3: The process of recruiting and retaining highly qualified faculty members must be in place and clearly documented. Also processes and procedures for faculty evaluation, promotion must be consistent with institution mission statement. These processes must be periodically evaluated to ensure that it is meeting with its objectives.

University follows recruitment policy given by the HEC. Induction of all positions at Faculty level is done as per rule:

- Different faculty positions are advertised in different newspapers of national circulation; 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 fixed by the University.
- The candidates are interviewed by the University Selection Board and Principal 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.
- At present, no procedure exists for retaining highly qualified faculty members, however, the revised pay scales of structure is quite attractive.
- HEC also supports appointment of highly qualified members as foreign faculty Professor, National Professors and deputes them in various departments of the University.

Standard 5-4: The process and procedures used to ensure that teaching and delivery of course material to the students emphasizes active learning and that course learning outcomes are met. The process must be periodically evaluated to ensure that it is meeting its objectives.

- To impart the most recent advances and techniques in entomology, course curriculum are regularly revised / updated time to time.
- With the emergence of new fields, new courses are set and included in the curriculum.
- Students usually buy relatively cheaper books of Asian Editions. These editions are also available in university library where computers, electronic journals and internet facility are made available to all faculty members and students.
- All sorts of audio visual aids are utilized in educational process.
• 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: The process that ensures that graduates have completed the requirements of the program must be based on standards, effective and clearly documented procedures. This process must be periodically evaluated to ensure that it is meeting its objectives.

• The Controller of Examinations announces the date of commencement of examination. After 10-20 days of the examinations, the controller office notifies the results of the students. The evaluation procedure involves quizzes, mid and final examinations, practicals, assignments and reports, oral and technical presentations. Candidates who secure 80% or above marks are awarded grade A; grade Gold medals are awarded to the students who secure highest marks in various fields. Degrees are awarded to the students on the annual convocation that is held annually.
CRITERION 6: FACULTY

6-1: There must be enough full time faculty who are committed to the program to provide adequate coverage of the program areas/courses with continuity and stability. The interests and qualifications of all faculty members must be sufficient to teach all courses, plan, modify and update courses and curricula. All faculty members must have a level of competence that would normally be obtained through graduate work in the discipline. The majority of the faculty must hold a Ph.D. in the discipline.

At present there is on professor, one associate professor, two assistant professors and two lecturers working in the programme. One assistant professor and two lecturers are abroad perusing Ph.D. studies.

Table 7. Faculty Distribution by Program Areas in Entomology

<table>
<thead>
<tr>
<th>Program area of specialization</th>
<th>Courses in the area and average number of students per year</th>
<th>Number of faculty members in each area</th>
<th>Number of faculty with Ph.D. degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Entomology</td>
<td>18</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>Stored Product Entomology</td>
<td>07</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td>Insect Biosystematics</td>
<td>05</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td>Applied Entomology</td>
<td>02</td>
<td>02</td>
<td>01</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32</strong></td>
<td><strong>7</strong></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>

Standard 6-2: All faculty members must remain current in the discipline and sufficient time must be provided for scholarly activities and professional development. Also, effective programs for faculty development must be in place. Effective Programs for Faculty Development

- Faculty members are provided with different academic, research and training facilities as per availability in the university system.
- Currently three faculty members are abroad for completion of their PhD degrees sponsored by HEC.
- Research supervisors are offered incentives for implementing different laboratory and filed experiments to promote high standard research activities.
**Standard 6-3:** All faculty members should be motivated and have job satisfaction to excel in their profession.

Motivation and encouragement are among the main tools for the better performance of the faculty team members. Faculty members are contented by the initiatives undertaken by the management in this regard. Formal and informal coaching by the senior faculty members, different entertainment events, field visits and excursions etc play a vital role in motivating the young faculty members.

**Faculty Survey:**

A figure represent the Faculty survey from Proforma 5 (Annexure V) were summarized. The result indicated that significantly 60% are satisfied as compared to others. However around 30% are very satisfied. Our HEC strengthened project will help to improve the practical workability.

At present one Professor, one associate professor, three assistant professors and four lecturers are working in the department. Most faculty members are experienced and professionally sound in their respective fields.
Faculty Resume

PERSONAL:
Name: Professor Dr. Muhammad Aslam
Ph.D. Entomology (UGA, USA) Gold Medallion
M.Sc (Hons) Agri in Entomology (UAF)
BSc (Hons) Agri in Entomology Gold Medal (UAF)
(Star, NE Award & Quaid-e-Azam Gold Medallist)

Father’s Name: Ch. Ali Muhammad
Nationality/Religion: Pakistani/Islam
Date/Place of Birth/Domicile: 15-2-1950/Sangla Hill (Sheikhupura) Punjab Pakistan
N I D C # 37405-2706966-5
Occupation: Teaching and Research at University Level.
Permanent Address: SN-312- A, Madina Town, Dhoke Kala Khan, Shamsabad, Murree Road Rawalpindi
Phone # (Residence)/ email: (051) 9062288, (051) 4423693, 0301-5502356/aslam502001@yahoo.com
Present Official Address: Professor (BS-21) / Chairman Department of Entomology, Pir Mehr Ali Shah Arid Agriculture University Rawalpindi (Pakistan).

CURRICULUM VITAE:

<table>
<thead>
<tr>
<th>Examination</th>
<th>Year</th>
<th>TOTAL MARKS</th>
<th>Marks Secured</th>
<th>Marks %/age</th>
<th>Division Position</th>
<th>Board/University</th>
<th>Specialization</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAV (Middle School Exam)</td>
<td>1965</td>
<td>900</td>
<td>753</td>
<td>83.67</td>
<td>1st</td>
<td>Rawalpindi Region (Chak No. 267 RB Faisalabad)</td>
<td>Govt. Anglo Vernacular Exam</td>
</tr>
<tr>
<td>SSC Examination</td>
<td>1967</td>
<td>900</td>
<td>737</td>
<td>81.89</td>
<td>1st</td>
<td>BISE Lahore</td>
<td>Science Group</td>
</tr>
<tr>
<td>F.Sc. (Intermediate Exam.)</td>
<td>1969</td>
<td>2000</td>
<td>1441</td>
<td>72.05</td>
<td>1st</td>
<td>University of Agriculture</td>
<td>Agriculture</td>
</tr>
<tr>
<td>B.Sc.(Hons) Agriculture</td>
<td>1972</td>
<td>3000</td>
<td>2236</td>
<td>74.53</td>
<td>1st, 1st (Gold Medal)</td>
<td>Agriculture</td>
<td>Entomology</td>
</tr>
<tr>
<td>M.Sc. (Hons) Agriculture</td>
<td>1981</td>
<td>700</td>
<td>520</td>
<td>74.28</td>
<td>1st</td>
<td>Faisalabad</td>
<td>Entomology</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>1988</td>
<td>CGPA= 3.50 / 4 (Gold Medallion)</td>
<td>University of Georgia (USA)</td>
<td>Entomology</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
DISTINCTIONS, AWARDS (NATIONAL/INTERNATIONAL) AND HONORARIA:

- **Topped** the University of Agriculture Faisalabad in 1972 and was decorated with a **GOLD MEDAL**
- Completed Ph.D in Entomology from UGA, USA in a record period of less than 3 years and got a Gold Medallion.
- Decorated with **PEF 8TH NATIONAL EDUCATION AWARD 2002** on account of quality publication of research papers on science.
- Decorated with **XIITH STAR AWARD 2002** by South Asia Publications based upon credentials and research publications par excellence.
- Decorated with **QUAID-E-AZAM GOLD MEDAL 2004** on account of best performance of duties and loyalty for the nation.
- Throughout merit scholarship holder starting from 5th class onward. Received **Saigol Foundation Scholarship** during B.Sc.(Hons)Agric on account of having first positions in the classes.
- Received Merit Certificate from Pakistan. Statistical. Association. in an Essay Reading Contest “Application of Statistics in Different Fields of Knowledge”.
- Received “**Honoraria**” from Pakistan. Tobacco Board in 1976 and 1978 on account of excellent performance of research duties.
- Nominated by the competent authority for best teacher award for 2001.
- Nominated by the competent authority for Presidential Award Izaz-e-Fazeelat for Academic Distinction for 2002 and 2003.
- Nominated by the competent authority for 16th Khwarzmi International Award 2003.

EXPERIENCE (TEACHING, RESEARCH AT NATIONAL/INTERNATIONAL LEVELS)

- Served Pakistan Tobacco Board (Govt of Pakistan as Tobacco Dev. Asstt. from **April 18, 1973** to October 10, 1974 and as Farm Manager from October 11, 1974 to March 26, 1982 and got experience in research on Virginia Tobacco. Established two Tobacco Research Stations (TRS) in Punjab and Founder of one TRS in Punjab.
- Served B.A.C. as Assistant Professor of Entomology from August 1, 1984 to April 30, 1985 against a leave vacancy.
- Served B.A.C. Rawalpindi as Lecturer in Entomology from May, 1, 1985 to September 12, 1985
- Proceeded USA as OSD on September 12, 1985 on the directive of the Governor Punjab and was back on August 26, 1988 after completing **Ph.D.** in Entomology.
- Promoted as **Assistant Professor, Entomology** w.e.f. 27-08-1988 and taught Entomology courses mentioned above.
- Served as **Associate Professor of Entomology from 28-10-1999 to 04-12-2004** and taught different Entomology Courses including Introductory Entomology, Stored Product
Entomology, Plant Resistance to Insect Pests, Insecticides and Their Application, Advances in Host Insect physiology, Plant Resistance; Research Methods in Entomology, Insects of Man and Animals, Insect Pest Management Systems, Insect Biochemistry, Insect Toxicology, Special. Problem and Seminar and conducted Research at UAAR in different research projects and supervised the graduate and postgraduate students.

- Appointed as **Professor of Entomology w. e. f. 04-12-2004** and teaching different courses at graduate and post graduate levels including Introductory Entomology, Stored Product Entomology, Plant Resistance to Insect Pests, Insect physiology, Insects of Man and Animals, Insect Pest Management Systems, Insect Biochemistry, Special. Problem and Seminar and conducting Research at UAAR in different research projects and supervising the graduate and postgraduate students.

- Remained Chairman, Dept of Entomology (1 1/2 years) and Library Incharge (3 years) in BAC and UAAR; framed library rules and prepared syllabi/curricula of Entomology at B.Sc. (Hons), M.Sc. (Hons), Ph.D. and UGC National levels. Introduced M.Sc. (Hons) in the Dept of Entomology.

- **Appointed as Chairman Department of Entomology UAAR w.e.f 02-05-2007**

- **Upgraded as Professor of Entomology BS- 21 w. e. f. 30-05-2007**

- Incharge English Declamation Contest Team UAAR. 1994. The team contested at Islamabad College for Boys and won “**Trophy**” (1st Position).

- HEC Ph.D Approved Supervisor in Entomology.

- Productive scientist of Pakistan as per PCST book.

- Member Research Co-ordination Board of UAAR for one year w.e.f. 15-07-1997.

- Member Advance Studies Research Board of PMASAAUR w.e.f 19-10-2007.

- Secretary, Departmental Board of Studies (for 8 years from 1991 to 1999).

- Secretary, Faculty (FCFS) Board from 14-03-1998 onward.

- Remained Secretary Tutorial Group System and Tutor group I for three years from 1998 to 2001.

- Learnt statistical & analytical techniques taking three courses in Statistics and one in Mathematics in University of Georgia (USA).

- Learnt word processing –Word Star on IBM computer in the Dept. of Entomology, University of Georgia (USA).

- Command on X-EDIT, Microsoft word, Microsoft excel, Microsoft power point, SPSS 10.1 for Windows and Network explorer.

- **Remained Deputy Director, Advanced Studies and Research, UAAR for two years (01-03-2001 to 27-03-2003) and evaluated about 15 Ph.D. and 275 M.Sc synopses/theses and dissertations.**

- Member Advanced Studies and Research Board of UAAR from 01-03-2001 to 01-03-2003.

- Declared as a resource person by Pakistan Agricultural Research Council to review and evaluate the Competitive Research Grant System, Agriculture Linkages Program Projects.

- On the panels of various admission, supervisory and comprehensive examination committees of UAAR. Remained Chairman, B.Sc. (Hons) Agric. Admission Committee for several years.

- Major advisor of several Post-graduate students (M.Sc. (Hons) and Ph.D), **Twenty two** completed degrees so far.

**Dr. Aslam as Principal Investigator of the following Research Projects:**

- UGC/UAAR funded Research Project. “Screening of Sunflower Cultivars against Insect Pests in the Potohar Region of Pakistan to Reduce Environmental Pollution Problems” Duration: 36 months Cost: 0.5 million.
PSF/R&D/P-UAAR/AGR/70. Integrated Management of Stored Chickpea Beetle, *Callosobruchus chinensis* Linnaeus. Duration: 36 months Cost: 0.6 million.

Project Director HEC Project Strengthening of Dept of Entomology (34.783 m) 2007-2009

**Dr. Aslam as Editor- in- Chief / Editor / Associate Editor of the following Magazines/Journals:**

- Editor- in- Chief (Pakistan) of American–Eurasian Journal of Agricultural and Environmental Sciences, IDOSI Publications Canada w.e.f. 10-04-2006.
- Editor, World Journal of Agricultural Sciences, IDOSI Publications Canada w.e.f. 4-2-2006.
- Associate Editor, Pakistan Journal of Arid Agriculture w.e.f. 27-03-2003.
- Remained Editor of Naveed-e-Baran for one year.
- Member Univ. Publication Committee for one year (1997)
- Subject Expert/Scientist to evaluate research papers of Pakistan Journal of Agriculture, Agricultural Engineering and Veterinary Sciences of Sindh Agriculture University Tandojam, Sindh, Pakistan Journal of Science and Technology, Federal Seed Certification and Registration Department, Islamabad.
- Referee Journal of Research (Science) of Bahauddin Zakariya University Multan **Dr. Aslam as External Examiner / Thesis Examiner of Ph.D. / M. Sc of the following Universities:**
  - Referee Ph.D. Synopses of Bahauddin Zakariya University Multan.
  - External Examiner of Postgraduate students in University of Agriculture, Faisalabad.
  - External Examiner and paper setter of Entomology courses of Gomal University, University College of Agriculture. AJ&K Univ. Muzaffarabad and University of Balochistan, Quetta.
  - Thesis Examiner of Ph. D. in Bangladesh Agricultural University Mymensingh, Bangladesh. **Dr. Aslam as Advisor, Foreign Students**
  - Advisor Foreign Students w.e.f. 14-06-2003 at UAAR to take care of the foreign student affairs. **Dr. Aslam as member of Inter University Course Curriculum Committee (IUCCC)**
  - Notified by Inter University Faculty Board (IUFB) as member IUCCC on Entomology vide University of the Punjab, Lahore letter No. D/284/R of 06-04-2004.

**Interviews conducted by Prof. Dr. Aslam**

- Interviews and tests of fields assistants and lower staff conducted at Tobacco Research Sub Station Kunjah (Gujrat) and appointed the employees required during 1980-82.
- Interviewed candidates (appeared for the positions of Assistant Research Officers / Agricultural Officers Plant Protection sub-group Entomology (BPS-17) in the Punjab Public Service Commission Lahore and assisted the Commission in the capacity of Advisor/Subject Expert to select the suitable candidates against these gazetted positions several times.
- Interviews of candidates (appeared for the positions of Lecturer in Entomology (BPS-17) in the Selection Board of Sargodha University were conducted in the capacity of Advisor/Subject Expert to select the suitable candidates against this gazetted position.
Appointed by the President of Bangladesh / Chancellor of the Bangladesh Agricultural University Mymensingh, Bangladesh as Expert Member on the Selection Committee for the appointment Professors and Associate Professors in the Department of Entomology of the University under the article 7 (1) (a) (iv) of the first statutes of the University w.e.f. 28-04-2007.

Dr. Aslam as External Examiner of Foreign National / International Universities
Acted as external examiner of Ph.D. thesis/dissertation of the following universities:

<table>
<thead>
<tr>
<th>S.#.</th>
<th>UNIVERSITY</th>
<th>TITLE OF THESIS/DISSERTATION EXAMINED</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bangladesh Agricultural University Mymensingh</td>
<td>Bioecology and management of stemfly, Ophiomyia phaseoli (Tryon) (Diptera: Agromyzidae) on blackgram.</td>
<td>23-08-2006</td>
</tr>
</tbody>
</table>

Memberships / fellowships and foreign training awards:
- Member of Entomological Society of America since 1986.
- Selected by Govt. of Pak. for higher education on competitive basis during 1985 and deputed to UGA, Athens (USA) officially as FAO FELLOW # 30, (UTF/PAK 1073) for Ph.D. (Entomology). Grant for Fellowship was awarded by Govt. of Pakistan., PARC Islamabad in collaboration with FAO of the UN and the USDA, International Organization Washington D.C.
- Member AGRICS since 1996.
- Founder and lifetime member of Agricultural Foundation of Pakistan since 1996.
- Member LEAD Pakistan (ID#1877)
- Member Pakistan Botanical Society since 19-03-1996.
- Member of research team to carry out research activities under a UNESCO sponsored project for Rural Education and Development during 1999.
- Life Time Member of Pakistan Education Forum Islamabad, since 31-12-2000. (R.No.261)
- M.Sc. (HONS.) THESIS; Effect of Dipel, Lannate and Thiodan on Agrotis ipsilon (Hfn) and Heliothis armigera (Hb) attacking Virginia Tobacco.
- HOBBIES: Reciting Holy Quran, attending “mehafilai qawwali”, observing nature (naturalist), travelling by train, patrolling on railway stations, visiting historical places, grave yards, monuments, watering, hoeing plants, loving medicinal plants.
- Literature collecting, citing, learning new computer commands, searching internet, updating biodata, writing scientific research papers, popular scientific articles, delivering scientific talks on electronic media.
### ADDITIONAL TRAININGS OF PROFESSOR DR. MUHAMMAD ASLAM

**CONGRESSES/CONFERENCES/WORKSHOPS/CONVENTIONS/SCIENTIFIC FAIRS/SEMINARS ATTENDED (NATIONAL AND INTERNATIONAL)**

<table>
<thead>
<tr>
<th>Nature of Training</th>
<th>From</th>
<th>To</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SHORT COURSES:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-do-</td>
<td>Sep. 9, 1974-Sep.14, 1974</td>
<td>-do-</td>
<td></td>
</tr>
<tr>
<td>-do-</td>
<td>Oct. 16, 1975-Oct 25, 1975</td>
<td>-do-</td>
<td></td>
</tr>
<tr>
<td>-do-</td>
<td>Sep. 13, 1976-Sep 18, 1976</td>
<td>-do-</td>
<td></td>
</tr>
<tr>
<td>Vertebrate pest Control</td>
<td>April 4, 1985-April 15,1985</td>
<td>NARCTI, Islamabad</td>
<td></td>
</tr>
<tr>
<td>Bee-keeping</td>
<td>April 28,1985-May 02, 1985</td>
<td>NARCTI, Islamabad</td>
<td></td>
</tr>
<tr>
<td>Computer Course</td>
<td>08-09-1997-22-09-1997</td>
<td>UIMS, UAA Rawalpindi</td>
<td></td>
</tr>
<tr>
<td>Biosafety and biosecurity Initiatives</td>
<td>June 18-19, 2007</td>
<td>Dept State, USA and PARC</td>
<td></td>
</tr>
<tr>
<td><strong>CONFERENCES:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Conference on Rural Pakistan</td>
<td>29-07-1999 to 30-07-1999</td>
<td>Auditorium, P-Block, Pak. Sec. IBD</td>
<td></td>
</tr>
<tr>
<td>3rd International Science Conference</td>
<td>26-09-2002 to 28-09-2002</td>
<td>UAAR</td>
<td></td>
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<tr>
<td>4th National Conference of Plant Pathology</td>
<td>14-10-2003 to 16-10-2003</td>
<td>UAAR</td>
<td></td>
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<tr>
<td>6th Sustainable Development Conference</td>
<td>11-12-2003 to 13-12-2003</td>
<td>Sustainable Development Institute, Islamabad.</td>
<td></td>
</tr>
<tr>
<td>National conference on the role of agriculture</td>
<td>21-04-2004</td>
<td>Agri Foundation of Pakistan, NARC, auditorium, Islamabad</td>
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<tr>
<td>In poverty alleviation</td>
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<td>Weed Science Society of Pakistan, UAAR</td>
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<tr>
<td>2nd International Weed Science Conference</td>
<td>20-03-2006,22-0306</td>
<td>UAAR</td>
<td></td>
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<tr>
<td>Agriculture</td>
<td>26-28 June, 2006</td>
<td>UAAR</td>
<td></td>
</tr>
<tr>
<td>International Conference: Value addition in horticultural products</td>
<td>16-12-2006</td>
<td>UAAR</td>
<td></td>
</tr>
<tr>
<td>17th International Food Science Conference</td>
<td>13-03-2007-14-03-2007</td>
<td>UAAAR, Auditorium</td>
<td></td>
</tr>
<tr>
<td>International conference on Biodiversity conservation as a renewable resource of Pakistan</td>
<td>22-03-2007-24--03-2007</td>
<td>UAAR/HEC</td>
<td></td>
</tr>
<tr>
<td>International conference on Role of allelopathy in Sustainable agriculture</td>
<td>29-31, 3 -2007</td>
<td>UAAR/HEC/PSF</td>
<td></td>
</tr>
<tr>
<td>International conference on Trade liberalization and Safa: Opportunities, concerns and challenges</td>
<td>25, 26, 2007</td>
<td>HEC/UAAR/GTAP</td>
<td></td>
</tr>
<tr>
<td>International conference on Biological resources of Pakistan: problems, resources and future perspectives (COCHAIRED ONE SECESSION)</td>
<td>19-03-1996 to 21-03-1996.</td>
<td>HEC, NATIONAL CORE GROUP IN LIFE SCIENCES</td>
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<td>CONGRESSES:</td>
<td>03-03-2003</td>
<td>UAAR</td>
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<tr>
<td>Second International Congress of Entomological Sciences</td>
<td>19-08-2008 to 20-08-2008</td>
<td>Pakistan Entomological Society and PARC IBD.</td>
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<tr>
<td>23 rd Pakistan Congress of Zoology (International)</td>
<td></td>
<td>Horticulutal Foundation of Pakistan, Auditorium, NARC, Islamabad.</td>
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<tr>
<td>National conference on ways and means to strengthen fruit and vegetable processing</td>
<td></td>
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</table>
### WORKSHOPS:

<table>
<thead>
<tr>
<th>Event</th>
<th>Dates</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Mutagenesis and Predictive Carcinogenesis</td>
<td>20-10-1982 to 31-10-1982</td>
<td>Held under the auspices of PARC IBD. The Associated Universities Inc. NSF, Washington, USA. NARCTI, IBD</td>
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<tr>
<td>Agricultural Genotoxicity in Developing Countries</td>
<td>1-11-1982 to 5-11-1982</td>
<td>NARC IBD.</td>
</tr>
<tr>
<td>Art of Becoming a Creative Research Scientist</td>
<td>23-12-1984 to 31-12-1984</td>
<td>UAAR Actionaid Pakistan at Holiday Inn, Islamabad</td>
</tr>
<tr>
<td>Training Workshop on Policy and Strategy for Rational Use of Pesticides.</td>
<td>05-06-2000 to 07-06-2000</td>
<td>----------do----------</td>
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<tr>
<td>Workshop on Urdu Fonts Development.</td>
<td>28-01-2003</td>
<td>UAAR</td>
</tr>
<tr>
<td>do</td>
<td>23-06-2004 to 24-06-2004</td>
<td>PSF, Auditorium, Islamabad in collaboration with UNESCO and ISESCO</td>
</tr>
<tr>
<td>Impact of Climate Change on Agriculture: Challenges and Strategies.</td>
<td>27-08-2003 to 29-08-2003</td>
<td>PSF auditorium, IBD</td>
</tr>
<tr>
<td>Wealth Generation Through Research</td>
<td>24-10-2003</td>
<td>UAAR, Pakistan Academy of Sciences</td>
</tr>
<tr>
<td>Second Workshop of the sub-regional network:Non-formal science education and popularization of science(Breaking the poverty cycle of women)</td>
<td>03-12-2003</td>
<td>PSF, Auditorium, Islamabad</td>
</tr>
<tr>
<td>International Workshop :Intensive farming and integrated resource management: Traditional and non-traditional approaches.</td>
<td>19-02-2004</td>
<td>UAAR, Pakistan Academy of Sciences</td>
</tr>
<tr>
<td>How to use digital library (workshop)</td>
<td>28-04-2004</td>
<td>PSF auditorium, IBD</td>
</tr>
<tr>
<td>Honey bees in the Himalayas: Promoting partnerships with the rural development networks in the HKH.</td>
<td>12-06-04/26-05-05/29-08-06</td>
<td>UAAR/Pakistan Academy of Sciences, UAAR Auditorium.</td>
</tr>
<tr>
<td>International workshop on Sanitary and phytosanitary measures in the wake of trade liberalization: Challenges to agriculture in developing countries</td>
<td>20-09-2004-22-09-2004</td>
<td>PSF, Auditorium, Islamabad</td>
</tr>
<tr>
<td>12-01-2005 to 14-01-2005</td>
<td>13-04-2005</td>
<td>UAAR, Pakistan Academy of Sciences</td>
</tr>
<tr>
<td>Workshop on Plant Molecular Biology. Biotechnology</td>
<td>30-1-2006,04-01-2006</td>
<td>PSF auditorium, IBD</td>
</tr>
<tr>
<td>National Workshop on role of Insect Taxonomy and Systematics in Sustainable Agriculture</td>
<td>13-02-2006 to 14-02-2006</td>
<td>UAAR/Pakistan Academy of Sciences, UAAR Auditorium.</td>
</tr>
<tr>
<td>Crop improvement, conventional and biotechnological</td>
<td>28-08-2006,30-08-2006</td>
<td>PSF, Auditorium, Islamabad</td>
</tr>
<tr>
<td>ApproachesAgro-Informatics. The future of Pakistan’s Agriculture I , II</td>
<td>09-09-2006, II 27-04-07</td>
<td>UAAR, Pakistan Academy of Sciences</td>
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<td>Workshop on biotechnology for secondary school teachers</td>
<td>09-12-2006</td>
<td>PSF, Auditorium, Islamabad</td>
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<tr>
<td>International workshop on Phytoremediation of contaminated soils and water</td>
<td>12-12-2006,15-12-2006</td>
<td>National Insect Museum, IPMP, IPEP, NARC/PARC Isalmabad</td>
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<tr>
<td>International workshop on techniques related to molecular biology and immunology</td>
<td>18-12-2006</td>
<td>HEC/NCB SEMINAR ROOM UAAR</td>
</tr>
<tr>
<td>Basic tools in isolation and identification of microorganisms.</td>
<td>27-12-2006,29-12-2006</td>
<td>I FAST House, National University, Rohtas Road G/9/4 Islamabad II NARC I slamabad Conference room UAAR</td>
</tr>
<tr>
<td>Agroinformatics the future of Pakistan’s Agriculture</td>
<td>27-04-2007</td>
<td>HEC/PSF Seminar Room UAAR</td>
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<tr>
<td>Training workshop Controlled and modified atmospheres to preserve post harvest quality of stored grains.</td>
<td><strong>30-07-2007 to 31-07-2007</strong></td>
<td>UAAR/HEC/NCB Seminar room UAAR</td>
</tr>
<tr>
<td>International workshop Carbon and water exchange in plants under changing climatic conditions</td>
<td>05-11-2007-06-11-2007</td>
<td>HEC / UAAR Seminar Room UAAR</td>
</tr>
<tr>
<td>___________________________________________________________________</td>
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<td>-------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
International workshop on Protected Horticulture
International Workshop on Molecular Techniques in Biological Research
Sharing Biodiversity Data on Internet
Integrating Agribusiness Curriculum and Practice UIMS HEC

CONVENTIONS:
- National Convention of Scientists and Engineers
- Convention of Scientists

SCIENTIFIC FAIRS ATTENDED:
- 4th National Science and Technology Fair
- BIIT Annual IT Project Exhibition
- Agricultural Mela, 2004
- AgriKiosk and software projects Exhibition
- Farmers day (Kissan Mela)
- Science and Technology EXPO 2007-shaping the future

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>International workshop on Protected</td>
<td>27-02-2008 to 01-03-2008</td>
<td>At Seminar Room PMAS AAUR PARC, Hotel Margala, Islamabad.</td>
</tr>
<tr>
<td>Horticulture</td>
<td>21,25 April 2008</td>
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</tr>
<tr>
<td></td>
<td>06 to 10 May 2008</td>
<td>Seminar Room PMAS AAUR</td>
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<tr>
<td>International Training workshop on</td>
<td>21-07-2008</td>
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<tr>
<td>Organic Farming: Organic Production</td>
<td>23-07-2008</td>
<td></td>
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<tr>
<td>and Inspection.</td>
<td></td>
<td>Seminars Room PMAS AAUR.</td>
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<tr>
<td>International Workshop on Molecular</td>
<td></td>
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<tr>
<td>Techniques in Biological Research</td>
<td></td>
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<tr>
<td>Sharing Biodiversity Data on Internet</td>
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<tr>
<td>Integrating Agribusiness Curriculum</td>
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<td></td>
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<tr>
<td>and Practice UIMS HEC</td>
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<tr>
<td>National Convention of Scientists and</td>
<td>27-05-1999</td>
<td>Convention Centre, IBD.</td>
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<tr>
<td>Engineers</td>
<td>24-05-2004, 09-04-2005,</td>
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<td></td>
<td>20-11-2006</td>
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<tr>
<td>Convention of Scientists</td>
<td></td>
<td>PSF, Holiday Inn Islamabad.</td>
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<tr>
<td>4th National Science and Technology</td>
<td>23-10-1999 to 01-11-1999</td>
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<tr>
<td>Fair</td>
<td>10-03-2004</td>
<td>Pakistan Science Foundation, Pakistan Sports</td>
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<td></td>
<td>28-08-2004</td>
<td>BIIT, St. Town, Rwp.</td>
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<tr>
<td></td>
<td>25-03-2006</td>
<td>Agri Dept. Sagri., RWP</td>
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<td></td>
<td>UIMS Library / CIT, UAAR.</td>
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<tr>
<td></td>
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<td>Installed stall of Entomology,</td>
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<td></td>
<td></td>
<td>Problems of insect pests were discussed with</td>
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<tr>
<td></td>
<td></td>
<td>the farmers, their solutions were conveyed</td>
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<tr>
<td></td>
<td></td>
<td>to them. Entomology literature in urdu on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>stored product pests, their management, was</td>
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<tr>
<td></td>
<td></td>
<td>distributed among the farmers who hailed</td>
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<tr>
<td></td>
<td></td>
<td>from far off areas.</td>
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<tr>
<td></td>
<td></td>
<td>Pakistan Science Foundation, Pakistan</td>
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<td></td>
<td></td>
<td>monument museum, West view point Shakarpri</td>
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<tr>
<td></td>
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<td>an Islamabad.</td>
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</table>

Installed stall of Entomology, Problems of insect pests were discussed with the farmers, their solutions were conveyed to them. Entomology literature in urdu on stored product pests, their management, was distributed among the farmers who hailed from far off areas. Pakistan Science Foundation, Pakistan monument museum, West viewpoint Shakarpian Islamabad.
### Seminars:

#### Seminars Delivered:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Date</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>Insect pests of Tobacco, delivered to the participants of 9th refresher course</td>
<td>20-10-1981</td>
<td>ATI, Peshawar</td>
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<tr>
<td>Behavior of Pesticides in Soil, delivered to the participants of Short Course on Environmental Pollution, “Ecological Risks And Sustainable Agriculture”</td>
<td>11-10-2000</td>
<td>UAAR</td>
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<tr>
<td>Automation of cottage industries of Pakistan, Seminar No 30 (software projects, technical seminar series)</td>
<td>08-12-2005</td>
<td>CIT/UAAR/LAB NO.5</td>
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<tr>
<td>Biosystematics of <em>Callosobruchus chinensis</em></td>
<td>31-07-2007</td>
<td>ENT UAAR</td>
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<td></td>
<td>16-09-1999, 1-3, 2008</td>
<td>Convention Centre, Islamabad</td>
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#### Seminars Attended:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Date</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>9th, 13th OIC Meeting (Ministerial Standing Committee) Seminar on Science and Technological Cooperation (Comstech)</td>
<td>04-04-2000</td>
<td>NARC, Islamabad</td>
</tr>
<tr>
<td>IPMI TOT/FFS Project Seminar</td>
<td>01-03-2001</td>
<td>NARC, Islamabad</td>
</tr>
<tr>
<td>Environment and Agriculture</td>
<td>14-06-2001</td>
<td>UAAR</td>
</tr>
<tr>
<td>Media War and Role of PTV</td>
<td>16-03-2001</td>
<td>Quaid-e-Azam University Islamabad.</td>
</tr>
<tr>
<td>Ecological Resources of the Northern Areas – Gradients in Climate and Vegetation</td>
<td>04-03-2002</td>
<td>PARC, Islamabad</td>
</tr>
<tr>
<td>Agricultural Policies</td>
<td>12-03-2002</td>
<td>UAAR</td>
</tr>
<tr>
<td>Education for Rural Development</td>
<td>02-10-2003</td>
<td>UAAR</td>
</tr>
<tr>
<td>Edible Oils</td>
<td>09-01-2003</td>
<td>UAAR</td>
</tr>
<tr>
<td>Food Technology</td>
<td>17-01-2003</td>
<td>UAAR</td>
</tr>
<tr>
<td>Development of a new rearing Technique of Chryposa</td>
<td>22-03-2003</td>
<td>UAAR</td>
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<tr>
<td>Mitigation of Water Crisis in Pakistan with special reference to Barani Areas</td>
<td>20-05-2003</td>
<td>The Agri Foundation of Pak, At ZTBL Islamabad</td>
</tr>
<tr>
<td>Science and Spiritualism</td>
<td>18-06-2003</td>
<td>The Agri Foundation of Pak, At ZTBL Islamabad</td>
</tr>
<tr>
<td>Genetically modified foods</td>
<td>23-09-2003</td>
<td>The Agri Foundation of Pak, At ZTBL Islamabad</td>
</tr>
<tr>
<td>Disaster Management</td>
<td>08-10-2003</td>
<td>Dr. Edward de Bono at National Library, Islamabad.</td>
</tr>
<tr>
<td>New Agricultural Policies And WTO</td>
<td>07-04-2004</td>
<td>UAAR, Auditorium</td>
</tr>
<tr>
<td>Creative Thinking</td>
<td>25-12-2003</td>
<td>Convention Centre, Islamabad</td>
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<td>----- do</td>
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<tr>
<td>Eleventh OIC Meeting (Ministerial Standing Committee on Scientific and Technological Cooperation (Comstech)</td>
<td>18-06-2007 to 19-06-2007</td>
<td>PARC Marriott Hotel Islamabad</td>
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</table>
Seminars attended continue:

- Understanding patentability issues of scientific research.
- Concepts in molecular breeding
- Diversification of Horticulture (Floriculture)
- Genetic transformation of wheat for salt tolerance
- Experimental studies of arthropod community, a source based approach.
- Characterization of local fennel (Foeniculum vulgare Mill) germplasm for oil contents and genetic variability.
- Characterization of Pakistani isolates of chili vein mottle potyvirus (ChiVMV)
- Environment in relation to air pollution and Agriculture
- Einstein the genius of the century, world year of physics 2005
- PSF awards for inventions and innovations
- Global perspectives in Iqbal’s thoughts New
- Chemistry and revolution in termite proofing
- Precision Horticulture
- Global proteomics profiling technologies identify Potential novel drug targets
- An overview of Animal Genomics
- Fertilizer use in Pakistan An overview
- The new urban development paradigm and the civil society responses in Karachi
- Role of agriculture and livestock in combating poverty
- Impact of soil organic matter on the soils filtering and buffering capacity.
- Precision agriculture technologies to increase farm profitability and reduce environmental risks
- Impact of climate change on agro - environment of Pakistan

<table>
<thead>
<tr>
<th>Date</th>
<th>Seminar Details</th>
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<tbody>
<tr>
<td>30-04-2004</td>
<td>Pakistan scientific &amp; technological information centre, PSF auditorium, IBD.</td>
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<tr>
<td>25-02-2005</td>
<td>Seminar room, UAAR.</td>
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<tr>
<td>02-04-2005</td>
<td>Dr. S.S.Sindhu Seminar Room UAAR</td>
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<td>14-04-2005</td>
<td>UAAR</td>
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<td>28-04-2005</td>
<td>Lecture room 7 UAAR.</td>
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<td>12-05-2005</td>
<td>UAAR</td>
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<td>04-08-2005</td>
<td>PSF auditorium, Islamabad</td>
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<td>22-08-2005</td>
<td>UAAR</td>
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<tr>
<td>29-12-2005</td>
<td>UAAR</td>
</tr>
<tr>
<td>07-01-2006</td>
<td>PSF Islamabad, auditorium</td>
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<tr>
<td>11-11-2006</td>
<td>Rumi Forum Pakistan G10/2 IBD</td>
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<td>20-11-2006</td>
<td>JB Holiday Inn ISLAMABAD UAR</td>
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<td>08/03/2007</td>
<td>Seminar room UAAR</td>
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<td>01-06-2007</td>
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<td>29-11-2007</td>
<td>UIMS PMASAAUR</td>
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<td>30-11-2007</td>
<td>FAO Auditorium PMASAAUR</td>
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<tr>
<td>07-12-2007</td>
<td>PMASAAUR</td>
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<tr>
<td>13-12-2007</td>
<td>Dr. Tehseen Aslam AGR New Zealand</td>
</tr>
<tr>
<td>23-05-2008</td>
<td>Seminar Room PMASAAUR</td>
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<tr>
<td>05-06-2008</td>
<td>--------------do--------------</td>
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</table>
ROF. DR. MUHAMMAD ASLAM ON PANEL OF VARIOUS ADMISSION/COMPREHENSIVE EXAMINATION COMMITTEES OF UNDERGRADUATE/POSTGRADUATE STUDENTS OF UAAR

## ADMISSION COMMITTEES

<table>
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<th>YEAR</th>
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## PROF. DR. MUHAMMAD ASLAM AS MEMBER OF COMPREHENSIVE EXAM. COMMITTEES (MSC AND PH.D)

<table>
<thead>
<tr>
<th>DEPARTMENT/INSTITUTION</th>
<th>YEAR</th>
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<tbody>
<tr>
<td>University Institute of Edu. and Research</td>
<td>2002</td>
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</table>

## PROF. DR. MUHAMMAD ASLAM AS MEMBER OF SCRUTINY COMMITTEES (MSC AND PH.D)

<table>
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<th>YEAR</th>
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</table>

## PROF.DR.MUHAMMAD ASLAM ON VARIOUS PANELS OF OTHER ORGANIZATIONS/UNIVERSITIES OF PAKISTAN

<table>
<thead>
<tr>
<th>ORGANIZATIONS/UNIVERSITIES</th>
<th>YEAR</th>
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PROF. DR. MUHAMMAD ASLAM ON DEPARTMENTAL BOARD OF STUDIES OF OTHER DEPARTMENTS/UNIVERSITIES

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<th>DEPARTMENT</th>
<th>YEAR</th>
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<tbody>
<tr>
<td>Biology</td>
<td>2008</td>
</tr>
<tr>
<td>Zoology</td>
<td>2008</td>
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</tbody>
</table>

PROF. DR. MUHAMMAD ASLAM AS MEMBER OF TWG (TECHNICAL WORKING GROUP) OF INSTITUTE OF PLANT AND ENVIRONMENTAL PROTECTION (IPEP), COOPERATIVE RESEARCH PROGRAMME ON MAIZE, SORGHUM AND MILLET (MSM), NARC SINCE 01-07-2004.

<table>
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<tr>
<th>IPEP, NARC, ISLAMABAD</th>
<th>YEAR</th>
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<tbody>
<tr>
<td>MSM</td>
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PROGRAMMES OF PROF. DR. MUHAMMAD ASLAM RECORDED/RELEASED ON ELECTRONIC MEDIA FOR THE BENEFIT OF FARMERS, GROWERS, GARDENERS, VILLAGERS AND GENERAL PEOPLE.

Programmes on pest problems of fruit/vegetable, field crops and stored grains and their solutions were released in “Harriayali” of PTV during 1993, 1994 and 1995.

Programmes recorded/released by Prof. Dr. Muhammad Aslam on PTV World, Kissan Time

<table>
<thead>
<tr>
<th>Name of the Programme</th>
<th>Date recorded/released</th>
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<tbody>
<tr>
<td>“Dhora, its damages and control”</td>
<td>17-03-2004</td>
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<tr>
<td>“Grain moth, its damages and control”</td>
<td>19-03-2004</td>
</tr>
<tr>
<td>“Snout weevil, its damages and control”</td>
<td>14-02-2004</td>
</tr>
<tr>
<td>“Flour beetle, its damages and control”</td>
<td>30-04-2004</td>
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<tr>
<td>“Lesser grain borer, its damages and control”</td>
<td>24-02-2004</td>
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<td>“Khapra, its damages and control”</td>
<td>3-05-2004</td>
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<tr>
<td>“Ghoon, its damages and control”</td>
<td>01-06-2004</td>
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<tr>
<td>“Termites, advantages, disadvantages and control”</td>
<td>11-06-2004</td>
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</table>
- “Advantages of qawar gandal” 20-07-2004
- “Citrus butterfly, useful, harmful aspects, control” 13-08-2004
- “Harmful aspects of aphids, educational survey and control” 07-08-2004
- “Lasura weevil, its damages and control” 02-10-2004
- “Harms of ticks and their control”. 06-10-2004
- “Documentary on harmful aspects of aphids” 18-10-2004
- “Aloe vera documentary” 31-12-2004
- “Documentary on termites” 13-01-2005
- “Harmful effects of ticks and their control” 10-02-2005
- “Advantages of Aloe vera” 19-02-2005
- “Documentary on kawar gandal” 25-02-2005
- “Preying mantis-a friendly insect” 05-04-2005
- “Aloe vera” 26-05-2005

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<table>
<thead>
<tr>
<th>S.#</th>
<th>NAME OF STUDENT</th>
<th>REG. NO</th>
<th>COMPLETION YEAR</th>
<th>TITLE OFThESI S / DISSERTATION / RESEARCH</th>
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<tbody>
<tr>
<td>1.</td>
<td>Asia Riaz</td>
<td>93-ag/arid-347</td>
<td>2006-09</td>
<td>Genetic variability in egg parasitoid (Trichogramma spp.) of important insect pest of okra.</td>
</tr>
<tr>
<td>3.</td>
<td>Muhammad Shoaib Ahmadani</td>
<td>03-arid-371</td>
<td>2005-08</td>
<td>Phytosanitary management of Trogoderma granarium Everts with Methyl Bromide alternatives to ensure food security and safety.</td>
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</table>
# POSTGRADUATE STUDENTS SUPERVISED BY PROFESSOR DR. MUHAMMAD ASLAM Ph.D. ENTOMOLOGY

<table>
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5. Qamar Zia 93-ag/arid-369 2007-10 Ecological studies of *Cotesia* spp. on maize stem borer and factors contributing to its efficiency as biocontrol agent.


8. Gulshan Irshad P.P. 97-arid-129 2007-10 Plant aero microbial population in the atmosphere of Rawalpindi and Islamabad (twin cities) and its impact on major crops.


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| 10| Muhammad Ijaz                      | 98-arid 807   | 2003 | Infestation trend of *Odontotermes obesus* (Rambur) on wheat crop  
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| 11| Ibrarul Hassan                     | 97-arid-140   | 2003 | Antixenosis test on Red Flour Beetle, *Tribolium castaneum* Herbst  
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<td>50. 141/2005/SJA</td>
<td>Peshawar Effect of adult diets</td>
<td></td>
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<tr>
<td>51. Federal Seed Certification Department Islamabad</td>
<td>Evaluating the seed reactions of certain chickpea genotypes against the action of pulse beetle (<em>Bruchidae:Coleoptera</em>)</td>
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<td>52. 222/2005/SJA</td>
<td>Peshawar Dynamics of chickpea pod borer………</td>
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<td>53. 266/2005/SJA</td>
<td>Peshawar Effect of grains Gelechiidae</td>
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<tr>
<td>54. World Journal of Agri Sciences</td>
<td>Incidence of boll weevil (<em>Coleoptera:Curculionidae</em>) and Pink boll worm (<em>Lepidoptera:Gelechiidae</em>) in early, middle and late maturing cotton with cattle grazing effects in cotton residues Mexico, USA</td>
<td></td>
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<td>55. PCST Islamabad</td>
<td>Effects of insecticides on faunal biodiversity in different ecosystems of Pak – Italy regions</td>
<td></td>
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<td>56. Sindh Agrivarsity PJAAEVS Tandojam</td>
<td>Biological parameters of <em>Chrysoperla carnea</em> (Stephen) on mustard and wheat aphids</td>
<td></td>
</tr>
<tr>
<td>57. Federal Seed Certification Department Islamabad</td>
<td>Resistance variability within gram seeds of different genotypes against the intrusion of cowpea weevil <em>Callosobruchus analis</em> L.</td>
<td></td>
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<tr>
<td>58. ALP PARC Islamabad</td>
<td>CS-128 Save grain campaign for public sector storage located in Sindh</td>
<td></td>
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<tr>
<td>59. ALP PARC Islamabad</td>
<td>CS-204 Management of peach flat headed borer, <em>Sphenoptera dadkhani</em> (Oben) and other borers causing gummosis problem in stone fruit orchards of Peshawar valley (NWFP)</td>
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<td>61.</td>
<td>Sindh Agrivarsity PJAAEVTS Tandojam</td>
<td>Response of newly developed high yielding and early maturing cotton strains against population of jassid (<em>Amrasca devastans</em> Dist)</td>
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<tr>
<td>62.</td>
<td>UAAR/PP</td>
<td>Stripe rust analysis of D-Genome synthetic wheats and their molecular diversity</td>
</tr>
<tr>
<td>63.</td>
<td>PSF/RES/P-NIAB/AGR(358)</td>
<td>Use of conventional and nuclear techniques to improve mass rearing of <em>Bracon heilcopter</em> (Say) and its host <em>Galleria mellonella</em> L</td>
</tr>
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<td>64.</td>
<td>UAAR PP</td>
<td>Screening of synthetic hexaploid subset for <em>Biolaris sorokiniana</em> (<em>Helminthosporium sativum</em>) and their D Genome diversity around microsatellite markers / or Rapds (RAPDS)</td>
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<tr>
<td>65.</td>
<td>UAAR PP</td>
<td>Evaluation of elite II synthetic hexaploid wheat against barley yellow dwarf virus and their molecular diversity</td>
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<td>68.</td>
<td>UAAR/PP</td>
<td>Epidemiology of yellow rust of wheat <em>Triticum aestivum</em> L.cm.Thell)</td>
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<td>69.</td>
<td>DR UAAR/RP</td>
<td>Characterization of epidemiology and biochemical factors in relation to resistance against mung bean yellow mosaic virus (MYMV)</td>
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<td>70.</td>
<td>PARC Pak J Agri Res Development and monthly percent damage of <em>Callosobruchus chinensis</em> L.</td>
<td>19-05-2007</td>
</tr>
<tr>
<td>71.</td>
<td>HEC proposal No. 993</td>
<td>Sustainable management of insect pests of rice crop with special reference to biocontrol agents and biorational insecticides</td>
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<tr>
<td>72.</td>
<td>University of Pune India Ph.D Dissertation</td>
<td>Bioefficacy and Residue Study of Lufenuron on Tribolium castaneum (Herbst) (Coleoptera Tenebrionidae)</td>
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<td>73.</td>
<td>M.Phil.biology. UAAR.</td>
<td>Food preferences of snow leopard (<em>Uncia uncia</em>) in Himalayas, North Pakisatan.</td>
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<td>74.</td>
<td>M.Phil.biology. UAAR.</td>
<td>Invitro anthelmintic activity of hydroalcoholic extracts of some Artemisia spp. – Indigenous of Northern areas of Pakistan.</td>
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<td>75.</td>
<td>Zoology UAAR.</td>
<td>The comparative haematology of beetal and Indigenous hairy goats (Jattal) reared in Potohar region of Pakistan.</td>
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<tr>
<td>76.</td>
<td>Zoology UAAR.</td>
<td>Incidence of tuberculosis in dairy farms of Islamabad area of Pakistan.</td>
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<td>77.</td>
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<td>Effect of different avian egg yolk in extender on the freezeability of buffalo spermatozoa.</td>
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<td>78.</td>
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<td>Seroprevalence of tonoplasma gondii, antibodies in farm animals reared at Kharimurat Livestock reproduction and production unit, Pakistan.</td>
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<td>79.</td>
<td>Zoology UAAR.</td>
<td>In vitro ovicidal and larvicidal activity of some locally available plants against gastro-intestinal nematodes of</td>
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<td>80</td>
<td>Zoology UAAR</td>
<td>Incidence and control of hypocal in dairy cattle and buffalo in Islamabad</td>
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<td>81</td>
<td>Zoology UAAR</td>
<td>Optimization of conditions for assessment of genetic diversity in some Asiatic bears</td>
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<td>82</td>
<td>Zoology UAAR</td>
<td>Determination of pollutants in the water and fish fauna of Kabul River, NWFP</td>
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<td>83</td>
<td>Zoology UAAR</td>
<td>Studies on the changing in Avian community structure of the river, Lahore</td>
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<td>84</td>
<td>Faculty Sciences</td>
<td>Evaluation of Technetium 99m radiolabeled antibiotics for use of nuclear medicine</td>
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<td>85</td>
<td>Faculty Sciences</td>
<td>Isolation, purification, and quantification of Quercetin from onion (Allium cepa)</td>
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<td>86</td>
<td>Zoology UAAR</td>
<td>Haematological changes in response to gastrointestinal infection (Gin) in salt range sheep reared at livestock production unit Kharimurit Pakistan</td>
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<td>87</td>
<td>Faculty Sciences</td>
<td>Isolation and characterization of active peptides from Pisum sativum (garden pea) having antimicrobial activity against mammalian pathogens</td>
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<tr>
<td>88</td>
<td>Faculty Sciences</td>
<td>Isolation and characterization of antimicrobial activity conferring components from the seeds of bitter gourd (Momordica charantia)</td>
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<td>89</td>
<td>Faculty Sciences</td>
<td>Expression studies and activity evaluation of bovine growth hormone using mammalian cell line</td>
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<td>90</td>
<td>ZOOLOGY UAAR</td>
<td>Prevalence and characterization of mycobacterium bovis in clinical isolates from patients of pulmonary tuberculosis</td>
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<td>91</td>
<td>Faculty Sciences</td>
<td>Genetic transformation of rice (Oryza sativa) for stress tolerance</td>
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<td>92</td>
<td>ZOOLOGY UAAR</td>
<td>Prevalence and characterization of pathogenic bacteria from fish culture in pond fertilized with different organic manures</td>
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<td>93</td>
<td>Zoology UAAR</td>
<td>Seasonal distribution of Cercariae of Fasciola gigantica infecting different freshwater snails of barani region of Pakistan</td>
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<td>94</td>
<td>ZOOLOGY UAAR</td>
<td>Minerals dynamics in dairy buffaloes fed on calcium and phosphorous supplementation</td>
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<td>95</td>
<td>ZOOLOGY UAAR</td>
<td>A cross sectional study: The regulation of anterior pituitary and adrenal hormones secretion in normal school going and working boys throughout puberty</td>
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<tr>
<td>96</td>
<td>ZOOLOGY UAAR</td>
<td>Preservation of Bull cauda epididymal spermatozoa</td>
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<td>97</td>
<td>Zoology UAAR</td>
<td>the assessment of iodine deficiency in lactating mothers residing in Islamabad and adjoining areas</td>
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<tr>
<td>98</td>
<td>Ph.D. Zoology</td>
<td>An epidemiological study on faciolosis in large ruminants of Potohar areas Pakistan</td>
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<td>99.</td>
<td>Faculty Sciences</td>
<td>Production of Lignin peroxidase by <em>Granoderma lucidum</em> using lignocellulosic inducer substrates.</td>
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<tr>
<td>100.</td>
<td>Zoology</td>
<td>UAAR determination of iodine deficiency in pregnant women residing in and around Rawalpindi-Islamabad.</td>
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<tr>
<td>101.</td>
<td>PP</td>
<td>UAAR Effect of inoculum density of root knot nematode on okra at different ages.</td>
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<tr>
<td>102.</td>
<td>PP</td>
<td>UAAR Biological approach for the management of collar rot (<em>Sclerotium roesii</em> Sacw) in Lentil (<em>Lens culinaris</em> Medik)</td>
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<td>103.</td>
<td>PP</td>
<td>PMAS AAUR Prevalence, distribution and partial characterization of cucumber mosaic Cucumovirus (CMV) in Chilli.</td>
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<tr>
<td>104.</td>
<td>PP</td>
<td>PMAS AAUR Characterizing novel wheat germplasm for kernal bunt resistance using phenological and molecular diagnostics.</td>
</tr>
<tr>
<td>105.</td>
<td>PP</td>
<td>PMAS AAUR Evaluation and Characterization of D Genome based synthetic hexaploid wheats for yellow rust resistance</td>
</tr>
<tr>
<td>109.</td>
<td>J. AGR RES FAISALABAD</td>
<td>Comparative efficacy of different Fenoxaprop formulations to control monocot weeds in wheat.</td>
</tr>
<tr>
<td>110.</td>
<td>Project proposal Hort Development and optimization of methods for determinations of pesticide residues in Kinnow mandarins</td>
<td>08-12-2007</td>
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<tr>
<td>111.</td>
<td>BZU Multan</td>
<td>Ph.D. Biodiversity and pollination: Plant pollinator interactions in semi natural landscape and agriculture of southern irrigated zone of Punjab, Pakistan</td>
</tr>
<tr>
<td>112.</td>
<td>BZU Multan</td>
<td>Ph.D. The role of bark beetle as a potential vector of mango quick decline and its management in the mango orchard.</td>
</tr>
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<td>113.</td>
<td>Biology M. Phil.</td>
<td>PMAS AAUR Isolation, Purification and Quantification of Quercetin from Onion (<em>Allium cepa</em> L.).</td>
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<td>114.</td>
<td>PP</td>
<td>Ph.D. PMAS AAUR Molecular characterization of <em>citrus tristeza</em> closterovirus (CTV) through coat protein gene sequence.</td>
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<tr>
<td>115.</td>
<td>PP</td>
<td>Ph.D. PMAS AAUR Plant aero microbial population in the atmosphere of Rawalpindi and Islamabad (twin cities) and its impact on major crops.</td>
</tr>
<tr>
<td>116.</td>
<td>Zoology M.Phil</td>
<td>PMAS AAUR in vitro ovicidal and larvicidal activity of some locality available plants species on gastrointestinal nematodes of small ruminants.</td>
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<td></td>
<td>PP M.Sc. (Hons) Evaluation of A, B and D wheat genome derived germplasms for powdery mildew resistance: Morpho-Molecular characterization, diversity and utilization potential for wheat improvement.</td>
<td>20-08-2008</td>
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<tr>
<td>118.</td>
<td>PP M.Sc. (Hons) Stripe rust resistance and genetic diversity of some “A” genome diploid progenitor resources of wheat.</td>
<td>20-08-2008</td>
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</table>
DR. MUHAMMAD NAEEM
Associate Professor

Area of Research
SYSTEMATICS AND ECOLOGY

Qualifications:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Institution</th>
<th>Position &amp; Research Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSc.(Hons)</td>
<td>1992</td>
<td>University of Agriculture Faisalabad, Pakistan</td>
<td>First Division Agricultural Entomology, Mantodea (Dictyoptera) of Punjab Province, Pakistan</td>
</tr>
<tr>
<td>BSc.(Hons)</td>
<td>1989</td>
<td>University of Agriculture Faisalabad, Pakistan</td>
<td>First Division Agricultural Entomology</td>
</tr>
</tbody>
</table>

Distinctions:
The following scholarships were awarded from the Govt. of Pakistan.
2. Pakistan Ministry of Education: Three years postgraduate foreign scholarship for Ph.D. in United Kingdom
3. Pakistan Ministry of Education: Two years scholarship for MSc.(Hons). UAF. Pakistan

Computer Applications:
Good knowledge and experience of the following computer softwares: Microsoft Word, Exel, Windows Paintbrush and Draw, Power point Idealist, Minitabe and SSPS for statistics, Cricket and Microcal Origin Graphics, Internet

Experience Highlights Research:
Systematic of Insects:
* Mantodea (Dictyoptera)
* Sphingidae (Lepidoptera)
* Aphids (Homoptera)
* Aphid parasitoids and hyperparasitoids (Hymenoptera)
* Aphid predators (Hoverflies: Diptera; Coccinellids: Coleoptera)

Integrated Pest Management (IPM)
Biological Control of the insect pests in a silvoarable agroforestry landscape.
Experimental studies of Arthropod community structure: a resource-based approach

Research and Teaching:
1994 Demonstrator to undergraduate, Leeds University, UK. Laboratory experience, insect collection, insect setting and identification, Field experience,

1996 Served as an invigilator in Leeds University in May-June.

1998-2001 Lecturer, Department of Entomology, University of Arid Agriculture, Rawalpindi.

2001-2005 Assistant Professor, Department of Entomology, University of Arid Agriculture, Rawalpindi.

2005 to date Associate Professor, Department of Entomology, University of Arid Agriculture, Rawalpindi.

Field Work:

1990-91 Mantids were collected various localities of the Punjab Province yielded 31 species in 21 genera under 5 families.

1994 Experience with Dr. D. Phillips in field samplings (leaf survey, yellow water-pan traps, pitfall traps and suction sampler) at Leeds University Farm, Headly Hall, Leeds.

1995 Experience with D. Blakely on Butterfly immature stages.

Associate Editor

2001 to 2003 Serving as associate editor of Pakistan Journal Of Arid Agriculture

Consultant Editor

Jan-July 2000 Worked as consultant editor for Pakistan Journal Of Arid Agriculture

Tutor group I

2001 to Jan. 2004 Serving as a tutor of group I in University of Arid Agriculture, Rawalpindi.

Secretary board of study

1999 to Jan. 2004 Serving as a secretary of the board of study of the Department of Entomology, UAAR.

Superintendent

2001 to Jan. 2004 Served as a superintendent of Boys Hostel, University of Arid Agriculture, Rawalpindi.

2006 to 2007 Superintendent of Jinnah Hall
Joint Secretary
2005 to date The AGRICS Alumni Association, Islamabad-Rawalpindi

Affiliations & Memberships:
Hold memberships of the following Organisation and Societies
1992-97 Agroforestry Research Group, UK
1993-97 Pakistan Overseas Society
1994-95 International Student Organisation
2002 to date The Agrics, Alumni Association, UAF.

Voluntarily work for three months to High Commission in London and Consulate of Pakistan in Bradford.

The following students completed their M.Sc.(Hons) under my Supervision
(a) Department of Entomology
7. Imran Abbas (00-arid-768). 2008. Comparative study of parasitoids attacking aphids on wheat and Brassica

Working
9. M. Daud-ul-Hassan Khan (01-arid-567) Responses of exotic vegetable crops of solanaceae family (brinjal, tomato, chillies) to major insect/pests under field conditions in Islamabad.
10. Saleha Shahid Siddiqui (03-arid-180) Responses of aphid and their natural enemies on cauliflower varieties
11. Ghulam Rabbani (07-arid-280) Biological studies of Diaretiella rapae (Mcintosh)
12. Muhammad Ramzan (07-arid-262) Taxonomic studies of cetonid beetle (Cetoniidae: coleoptera) of Pothwar Region.
13. M. Mohsin Hasnat (03-arid-280) Taxonomy of crane flies of Pothwar region
(b) Department of Zoology
17. Fozia Bashir (00-arid-1012). Screening of Different Wheat cultivars ……………………

(C) Working
18. Imran Bodla. Ph.D. Student, Department of Entomology
19. Ahmad Zia (98-arid-889) Biosystematics of Damselflies (Zygoptera; Odonata) of Pakistan.
20. Qamar Zia (93-ag/arid-369) Ecological studies of Cotesia spp. on maize stem borer and factors contributing to its efficiency as biocontrol agent.

Member for M.Sc.(Hons.) Students
10 students

Member for Ph.D. Students
2 student
RESEARCH PUBLICATIONS:

National


**International**


BIO DATA OF MR. HUMAYUN JAVED
M. Sc. (HONS.) AGRI. ENTOMOLOGY.

PARTICULARS.
A. **PERSONAL**
   1. Name               Humayun Javed
   2. Father’s Name      Abdul Wahid
   3. Date of Birth      4.4.1961 (Fourth April nineteen sixty one)
   4. Domicile place     Punjab (Pakistan)
   5. Identity card No.  37405-0677403-7
   6. Permanent address  DAA-House No. 4, street No. 6 Muslim Town, Kurri Road, Rawalpindi
   7. Mailing address    Assistant Professor Entomology, University of Arid Agriculture, Rawalpindi.

B. **EDUCATIONAL QUALIFICATION RECORD**

<table>
<thead>
<tr>
<th>S.#.</th>
<th>Name of Institute</th>
<th>Year of Passing</th>
<th>Division</th>
<th>Subject</th>
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<td>C. G. P. A. (3.57)</td>
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<td></td>
<td></td>
<td>C. G. P. A. (3.66)</td>
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</table>

C. **DISTINCTIONS**
   Stood first in B. Sc. (Hons.) Agric. Department of Entomology at Barani Agricultural College, Rawalpindi.

D. **EXPERIENCE**
   Working as Assistant Professor, Department of Entomology University of Arid Agriculture, Rawalpindi.

E. **THESIS TITLE.**
   Studies on the Biophysico-Chemical Resistance of Some Cotton Cultivars against Cotton Pest Complex.
F. COURSES ATTENDED.

<table>
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<tr>
<th>S.#.</th>
<th>Course</th>
<th>From</th>
<th>To</th>
<th>Institute</th>
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<tr>
<td>3.</td>
<td>Bee-Keeping</td>
<td>15th May 1989</td>
<td>19th May 1989</td>
<td>-do-</td>
</tr>
<tr>
<td>5.</td>
<td>Teaching Methodology</td>
<td>29th July 1989</td>
<td>10th Aug 1989</td>
<td>-do-</td>
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</tbody>
</table>

G. ACTIVITIES & RESPONSIBILITIES.

1. Worked as Assistant Controller of Examinations, University of Arid Agriculture, Rawalpindi.
2. Laboratory Incharge Department of Entomology, University of Arid Agriculture, Rawalpindi.
3. Incharge maintenance Block-A, University of Arid Agriculture, Rawalpindi.
6. Tutor tutorial J. group at the University of Arid Agriculture, Rawalpindi.
H. PUBLICATIONS:


LIST OF PUBLICATIONS
PUBLICATIONS OF PROFESSOR DR. MUHAMMAD ASLAM
RESEARCH PAPERS (PUBLISHED)


INTERNATIONAL PUBLICATIONS


NOTE: (All these papers have been published in the journals of international repute)

SCIENTIFIC POPULAR ARTICLES (PROF. DR. MUHAMMAD ASLAM)


116


**RESEARCH PUBLICATIONS BY DR MUHAMMAD NAEEM**

**National**


International Workshop of Sanitary and Phytosanitary Measures. 81-88pp. UAAR.


**International**


RESEARCH PUBLICATIONS BY MR. HUMAYUN JAVED


CRITERION 7: INSTITUTIONAL FACILITIES

Standard- 7.1: The institution must have the infrastructure to support new trends in learning such as e-learning:

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 lacks facilities as mentioned below:

- Majority of the faculty members do not have access to the PCs as department have only two Computers provided by the university.
- No registered softwares of computer programmes are available to be installed at departmental level.
- No regular/prompt arrangements are available to resolve IT and Telecommunication issued faced by the faculty members / students in the department.
- IT issues, Virus problems, Telephone sets/connections, Internet connections often remain out of ordered.
- Registered antivirus software is immediately required.
- Registered version s of Microsoft Windows, Office XP, Adobe reader, writer are required.
- A printer with in built scanner and fax facility is urgently needed by the department.

Standard- 7.2: The library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personnel

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. Department itself does not have a library. It needs funds allocation to establish a well equipped library at departmental level.

Standard- 7.3: Class-rooms must be adequately equipped and offices must be adequate to enable faculty to carry out their responsibilities

Currently the class rooms are not enough and the space is not only limited but some basic facilities are lacking. Multimedia are not available for the lecture halls. Practical lab space is also not meeting the needs which affects the quality of teaching. Although at present offices for
the faculty are sufficient, yet on the return of the remaining faculty, we will face severe problem regarding shortages of offices for the staff.
CRITERION 8: INSTITUTIONAL SUPPORT

The university administration has been striving to strengthen all the departments and upgradation of departments and establishing new Faculties and Institutes. The university is also trying to attract highly qualified faculty members. Currently, the university has launched tenure track system which would be helpful in pooling up better human recourses as faculty members.

Standard 8-1: 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

At present department is having inadequate financial resource to meet the present needs for a better education system. Individual research grants for students and faculty are mainly supporting the departmental research activities. Keeping in view the awful need for increasing the financial resources to establish a library, laboratories and computer facilities, The HEC has approved a project for strengthening the department. This project will prove beneficial in improving the quality of education and research.

Standard 8-2: There must be an adequate number of high quality graduate students, research assistants and Ph.D. students.

The department offers admission annually to graduate and M.Sc. Hons students. However Ph.D. admission are usually offered in each semester.

RESEARCH STUDENTS REVIEW

Proforma 4 was used to conduct survey to review the progress of Ph.D and M.Sc. Hons students. General inferences are drawn hereunder.

- Most of the students were satisfied with the level of supervision.
- The students had access to the available sophisticated equipments.
- The students have access to scientific literature through central laboratory.
- Some students requested provision of computers.
Some students argued that equipments relating molecular and biochemical techniques should be made available in the department to carry out biochemical analysis of cereals, toxicological study of insecticides and biosystematics study of insects.

**Standard- 8.3: Financial resources must be provided to acquire and maintain Library holdings, laboratories and computing facilities.**

Although administration provides adequate financial resources, yet there is need to increase budget to carry out advance level research.
Summary and Conclusions

Since its inception, Department of Entomology, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi has been endeavoring for setting high standards both in research and human resource development. Prior to the establishment of Arid Agriculture University in 1994, this department had been working with in the domain of Barani Agricultural College, Rawalpindi. Entomology department has played an exclusive role in providing technical input in providing highly skilled man power to cater future needs of educational institutions, research organizations, international setups, private sector and extension department. Presently, 5 faculty members are performing research and educational activities.

Entomology Department deals with the production of highly skilled manpower both at graduate and post-graduate levels and providing practical and economical solution to the insect pest problems for enhancing agricultural productivity in arid agriculture setup. The major objectives of this program include equipping graduates with necessary theoretical & practical knowledge in Entomology and conduct research to devise environment friendly IPM practices. The program’s mission objectives and outcomes are evaluated and strategic work plans are formulated to achieve stipulated measurable goals. Most of the Program’s outcomes are found highly satisfactory. Teachers’ evaluation figures of four teachers depict very much pleasing (satisfactory) standards; their performance score ranges from 4.42 to 4.73 with an average of 4.59. Student’s evaluation score ranged from 3.79 to 4.32 with an average value of 4.07. Alumni survey revealed demonstrate variable results with regard to different traits like knowledge, management and leadership qualities, interpersonal communication skill etc. Bottlenecks earmarked as lack of scientific equipment in laboratories along with computers and their accessories. Meanwhile the department has also been provided community technical services in household and field pest management. Additionally, the employer survey depicted an above average level of graduates’ success and was ranked above 70% with regard to their knowledge and personality traits.

Department also rendered its technical input in designing and development of courses curriculum. Observing the required terms and conditions all pre-requisites were made available. Periodic examinations were conducted as per schedules given by the Controller Exams and all
of the academic schemes were prepared strictly keeping the given timeline. The number of courses along with their titles and credit hours for each semester, their course contents for different degree programs were fully planned and finalized. The level of their efficacy also falls between satisfactory and highly satisfactory rank.

This report also indicates the available facilities and bottlenecks both in the field research and education. Presently, through an HEC funded project, facilities both for quality research and education are being developed at department level. This development will help both students and faculty members in attaining stipulated targets in an efficient manner. Proper measures have been adopted to train students in effective communication and motivation skill, organizing meetings and tutorials, conducting field visits, hunting employment and effective interaction with professionals and farming community.

In addition to that procedures and practices set forth by the HEC and the university are fully observed during different processes involved in admission, registration, recruitment policy, delivery of material, academic requirement and performance evaluation etc. To update the knowledge of the faculty members and improve their skills, training institutions at national and international level must be getting in touch with. In this regard a varied level of information was gathered but within satisfactory level (> 50%). Bottlenecks incase of availability of infrastructure, library facility, and class room/laboratory equipment were also identified; thus institutional support in this regard can play a pivotal role in streamlining the sustained development of the institution.
Annexure -1

Proforma - 1
Student Course Evaluation Questionnaire
(To be filled by each Student at the time of Course Completion)

Department __________________________ Course No __________________________
Course Title __________________________ Teacher Name __________________________
Year of Study __________________________ Semester / Term __________________________

Please give us your views so that Course quality can be improved. You are encouraged to be frank and constructive in your comments.

**CORE QUESTIONS**

<table>
<thead>
<tr>
<th>Course Content and Organization</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The course objectives were clear</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>2. The Course workload was manageable</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>3. The Course was well organized (e.g. timely access to materials, notification of changes, etc.)</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>4. Comments</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

**Student Contribution**

<table>
<thead>
<tr>
<th>Approximate level of your own attendance during the whole Course</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>□&lt;20% □21-40% □41-60% □61-80% □&gt;81%</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>5. I participated actively in the Course</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>6. I think I have made progress in this Course</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>7. Comments</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Learning Environment and Teaching Methods</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. I think the Course was well structured to achieve the learning outcomes (there was a good balance of lectures, tutorials, practical etc.)</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>10. The learning and teaching methods encouraged participation.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>11. The overall environment in the class was conducive to learning.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>12. Classrooms were satisfactory</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>13. Comments</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
### Learning Resources

14. Learning materials (Lesson Plans, Course Notes etc.) were relevant and useful.  
15. Recommended reading Books etc. were relevant and appropriate  
16. The provision of learning resources in the library was adequate and appropriate  
17. The provision of learning resources on the Web was adequate and appropriate (if relevant)  
18. Comments

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

### Quality of Delivery

19. The Course stimulated my interest and thought on the subject area  
20. The pace of the Course was appropriate  
21. Ideas and concepts were presented clearly  
22. Comments

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Assessment

23. The method of assessment were reasonable  
24. Feedback on assessment was timely  
25. Feedback on assessment was helpful  
26. Comments

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Additional Core Questions

### Instructor / Teaching Assistant Evaluation

27. I understood the lectures  
28. The material was well organized and presented  
29. The instructor was responsive to student needs and problems  
30. Had the instructor been regular throughout the course?

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

### Tutorial

30. The material in the tutorials was useful  
31. I was happy with the amount of work needed for tutorials  
32. The tutor dealt effectively with my problems

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>
**Practical**

33. The material in the practicals was useful

34. The demonstrators dealt effectively with my problems.

**Overall Evaluation**

35. The best features of the Course were:

36. The Course could have been improved by:

**Equal Opportunities Monitoring (Optional)**

37. The University does not tolerate discrimination on any irrelevant distinction (e.g. race, age, gender) and is committed to work with diversity in a wholly positive way. Please indicate below anything in relation to this Course which may run counter to this objective:

**Demographic Information: (Optional)**

38. Full/part time study: Full Time ☐ Part Time ☐

39. Do you consider yourself to be disabled: Yes ☐ No ☐

40. Domicile:

41. Gender:

42. Age Group: less than 22 ☐ 22-29 ☐ over 29 ☐

43. Campus: Distance Learning/ Collaborative ☐

THANK YOU
Annexure -2

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>
<tbody>
<tr>
<td>Course Code:</td>
<td>Title:</td>
</tr>
<tr>
<td>Session:</td>
<td>Semester:</td>
</tr>
<tr>
<td>Credit Value:</td>
<td>Level:</td>
</tr>
<tr>
<td>Name of Course Instructor:</td>
<td>No. of Students Contact Hours</td>
</tr>
<tr>
<td>Assessment Methods:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>give precise details (no &amp; length of assignments, exams, weightings etc.)</td>
</tr>
</tbody>
</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>
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</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>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>

Overview/Evaluation (Course Co-ordinator’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)
Proforma 3

Annexure -3

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
    A  B  C  D  E
11. Environment was conducive for learning

A    B    C    D    E

12. Whether the infrastructure of the department was good.

A    B    C    D    E

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

A    B    C    D    E

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

A    B    C    D    E

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.
Proforma 4

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 coursework
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?

Student ______________________________ Date: __________________

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)

Principal Supervisor: __________________ Date: ________________
Co-Supervisor: ___________________________   Date: _____________
Co-Supervisor: ___________________________   Date: _____________

Head of Department Comments:

Signature: _______________________________   Date: _____________

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

Signature: _______________________________   Date: _____________

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

Annexure -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 your 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: ____________
Annexure -6

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>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Name of Department</td>
</tr>
<tr>
<td>1.2</td>
<td>Name of Faculty</td>
</tr>
<tr>
<td>1.3</td>
<td>Date of initiation of Ph.D. program</td>
</tr>
<tr>
<td>1.4</td>
<td>Total number of academic journals subscribed in area relevant to Ph.D. program</td>
</tr>
<tr>
<td>1.5</td>
<td>Number of Computers available per Ph.D. student</td>
</tr>
<tr>
<td>1.6</td>
<td>Total Internet Bandwidth available to all the students in the Department</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Faculty Resources:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Number of faculty members holding Ph.D. degree in the department</td>
</tr>
<tr>
<td>2.2</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></td>
</tr>
<tr>
<td>3.1</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>3.2</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>3.3</td>
<td>Total number of ongoing research projects in the department funded by different organizations</td>
</tr>
<tr>
<td>3.4</td>
<td>Number of post-graduate students in the department holding scholarships/fellowships</td>
</tr>
<tr>
<td>3.5</td>
<td>Total Research Funds available to the Department from all sources</td>
</tr>
<tr>
<td>3.6</td>
<td>Number of active international linkages involving exchange of researchers/students/faculty etc. (Attach Details)</td>
</tr>
<tr>
<td></td>
<td>Student Information:</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td></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>4.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of Ph.D. students currently enrolled in the department.</td>
</tr>
<tr>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ratio of number of students accepted to total number of applicants for Ph.D. Program.</td>
</tr>
<tr>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Program Information</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>Entrance requirements into Ph.D. Program (M.Sc. / M.Phil.)</td>
</tr>
<tr>
<td></td>
<td>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></td>
</tr>
<tr>
<td></td>
<td>a. Ph.D. Qualifying examination (Y/N)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Comprehensive examination (Y/N)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Research paper in HEC approved Journal</td>
</tr>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Any other examination (Y/N)</td>
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<td></td>
<td></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>
<tr>
<td>6</td>
<td>Additional Information</td>
</tr>
<tr>
<td>6.1</td>
<td>Any other information that you would like to provide.</td>
</tr>
</tbody>
</table>
Alumni Survey

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

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.

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

1. 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. IT knowledge  
   (A)  (B)  (C)  (D)  (E)

II Communications 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. Ability to work in arduous /Challenging situation  
   (A)  (B)  (C)  (D)  (E)
3. Independent thinking  
   (A)  (B)  (C)  (D)  (E)
4. Appreciation of ethical Values  
   (A)  (B)  (C)  (D)  (E)

IV Management /Leadership Skills
1. Resource and 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. (New courses that you would recommend and courses that you did not gain much from)

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
VI. Career Opportunities

VII. Department Status
1. Infrastructure (A) (B) (C) (D) (E)
2. Faculty (A) (B) (C) (D) (E)
3. Repute at National level (A) (B) (C) (D) (E)
4. Repute at international level (A) (B) (C) (D) (E)

VIII. Alumni Information
1. Name (Optional)
2. Name of organization
3. Position in organization
4. Year of graduation
Proforma 8

Annexure -8

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 now 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:
Annexure -9

Proforma 9

Faculty Resume

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

<table>
<thead>
<tr>
<th>Personal</th>
<th>May include address(s) and phone number(s) and other personal information that the candidate feels is pertinent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience</td>
<td>List current appointment first, each entry as follows: Date, Title, Institution.</td>
</tr>
<tr>
<td>Honor and Awards</td>
<td>List honors or awards for scholarship or professional activity.</td>
</tr>
<tr>
<td>Memberships</td>
<td>List memberships in professional and learned Societies, indicating offices held, committees, or other specific assignments.</td>
</tr>
<tr>
<td>Graduate Students Postdocs Undergraduate Students</td>
<td>List supervision of graduate students, postdocs and undergraduate honors theses showing:</td>
</tr>
<tr>
<td>Honour Students</td>
<td>Years</td>
</tr>
</tbody>
</table>

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

<p>| Service Activity | List University and public service activities. |</p>
<table>
<thead>
<tr>
<th>Brief Statement of Research Interest</th>
<th>May be as brief as a sentence or contain additional details up to one page in length.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Publications</strong></td>
<td><strong>List publications in standard bibliographic format with earliest date first.</strong></td>
</tr>
<tr>
<td></td>
<td>- Manuscripts accepted for publication should be included under appropriate category as “in press;”</td>
</tr>
<tr>
<td></td>
<td>- Segment the list under the following standard headings:</td>
</tr>
<tr>
<td></td>
<td>* Articles published by refereed journals.</td>
</tr>
<tr>
<td></td>
<td>* Books.</td>
</tr>
<tr>
<td></td>
<td>* Scholarly and / or creative activity published through a refereed electronic venue.</td>
</tr>
<tr>
<td></td>
<td>* Contribution to edited volumes.</td>
</tr>
<tr>
<td></td>
<td>* Papers published in refereed conference proceedings.</td>
</tr>
<tr>
<td></td>
<td>* Paper or extended abstracts published in conference proceedings. (referenced on the basis of abstract)</td>
</tr>
<tr>
<td></td>
<td>* Articles published in popular press.</td>
</tr>
<tr>
<td></td>
<td>* Articles appearing in in-house organs.</td>
</tr>
<tr>
<td></td>
<td>* Research reports submitted to sponsors.</td>
</tr>
<tr>
<td></td>
<td>* Articles published in non-refereed journals.</td>
</tr>
<tr>
<td></td>
<td>* Manuscripts submitted for publication. (include where and when submitted).</td>
</tr>
<tr>
<td><strong>Research Grants and Contracts.</strong></td>
<td><strong>Entries should include:</strong></td>
</tr>
<tr>
<td>Date</td>
<td>Title</td>
</tr>
<tr>
<td><strong>Total Award Amount</strong></td>
<td></td>
</tr>
<tr>
<td>Segment the list under following headings:</td>
<td></td>
</tr>
<tr>
<td>* Completed</td>
<td></td>
</tr>
<tr>
<td>* Funded and in progress</td>
<td></td>
</tr>
<tr>
<td>* In review</td>
<td></td>
</tr>
<tr>
<td><strong>Other Research or Creative Accomplishments</strong></td>
<td><strong>List patents, software, new products developed, etc.</strong></td>
</tr>
<tr>
<td><strong>Selected Professional Presentations</strong></td>
<td><strong>List presentations given at professional society meetings</strong></td>
</tr>
</tbody>
</table>
Teacher Evaluation Form
(To be filled by the student)

Course Title and Number: ________________________________
Name of Instructor: ___________________________ Semester __________________
Department: __________________________ Degree __________________

Use the scale to answer the following questions below and make comments

A: Strongly Agree  B: Agree  C: Uncertain  D: Disagree  E: Strongly Disagree

<table>
<thead>
<tr>
<th>Instructor:</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Instructor is prepared for each class</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>2. The Instructor demonstrates knowledge of the subject</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>3. The Instructor has completed the whole course</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>4. The Instructor provides additional material apart from the textbook</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>5. The Instructor gives citations regarding current situations with reference to Pakistani context</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>6. The Instructor communicates the subject matter effectively</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>7. The Instructor shows respect towards students and encourages class participation</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>8. The Instructor maintains an environment that is conducive to learning</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>9. The Instructor arrives on time</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>10. The Instructor leaves on time</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>11. The Instructor is fair in examination</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>12. The Instructor returns the graded scripts etc. in a reasonable amount of time</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>13. The Instructor was available during the specified office hours and for after class consultations</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
</tbody>
</table>

14. Course:

15. The Subject matter presented in the course has increased your knowledge of the subject | A  | B  | C  | D  | E  |

16. The syllabus clearly states course objectives requirements, procedures and grading criteria | A  | B  | C  | D  | E  |

17. The course integrates theoretical course concepts with real-world applications | A  | B  | C  | D  | E  |

18. The assignments and exams covered the materials presented in the course | A  | B  | C  | D  | E  |

19. The course material is modern and updated | A  | B  | C  | D  | E  |


Annexure-XI: Detailed Course Contents of B. Sc. (HONS.) degree in Entomology

**Ent-301  Introductory Entomology  4(3-2)**

**Theory:**
Introduction; phylum Arthropoda and its classification; external and internal morphology and physiology of insects with particular reference to ‘ak’ grasshopper, *Poekilocerus pictus*; metamorphosis and its types; insect classification and nomenclature; salient characters of insect orders with important families and insects.

**Practical:**
Collection and preservation of insects; characters of classes of Arthropoda; external and internal morphology of ‘ak’ grasshopper; temporary mounts of different types of appendages of insects; types of metamorphosis; salient characters of insect orders with important examples.

**Books Recommended:**

**Ent-302  Applied Entomology  4(3-2)**

**Theory:**
Introduction; evidence, causes of success and economic importance of insects; principles and methods of insect control; insecticides, their classification, formulations and application equipment; identification, life history, mode of damage and control of important insect pests of various crops, fruits, vegetables, stored grains and household with particular reference to barani areas, introduction to miscellaneous pests; entomological industries: apiculture, sericulture and lac-culture.
Practical:
Collection, identification and mode of damage of insect pests of various crops, fruits, vegetables, stored grains and household; insecticide formulations and their computations; use of application equipment; practical instructions in apiculture, sericulture and lac-culture.

Books Recommended:

Ent-501 Insect Morphology 4(3-2)

Theory:
Introduction; Integument and its derivatives; Body regions; Segmentation, sclerites, sulci and appendages of head, thorax and abdomen in different insects; Endoskeleton and internal organ systems; Exocrine and Endocrine organs.

Practical:
Structure of integument and its derivatives; comparative external and internal morphology of different insect orders.

Recommended:
Ent-502  Insect Physiology  3(2-2)

Theory:
Introduction; Embryonic and Post-embryonic Development; Physiology of integument, digestive, respiratory, circulatory, excretory, reproductive, muscular and nervous systems; Sense organs and perception; Production and Function of hormones and pheromones.

Practical:
Study of cuticular proteins; physiology of digestion, respiration, circulation, excretion, reproduction, musculature and sensation; Hormones and pheromones.

Books Recommended:

Ent-503  Insect Taxonomy  4(2-4)

Theory:
Introduction; History, functions and concepts; Tasks of a taxonomist; Taxonomic categories; taxonomic procedure: Collections, samples and methods of sampling, identification, taxonomic discrimination, taxonomic characters, variations in population; Presentation of findings: Descriptions, taxonomic keys, speciation and phylogenies, preparation of taxonomic paper; Code of zoological nomenclature; Introduction to numerical taxonomy and phylogenetic systematics.
Practical:
Methods of collection, preservation and labeling of insects; Preparation of taxonomic keys; Identification of insects with taxonomic keys; Cataloguing and writing of descriptions of identified insects; Preparation of phenograms and phylogenetic trees.

Books Recommended:

Ent-504 Agricultural Pests 4(2-4)

Theory:
Introduction; Identification, distribution, host plants, biology, damage and control of insect, mite and vertebrate pests of field crops, vegetables and orchards.

Practical:
Collection and identification of insect pests of agricultural importance and their damage; Demonstration of control measures.

Books Recommended:

Ent-505 Plant Resistance to Insect Pests 3(2-2)

Theory:
Introduction; Mechanisms of resistance: Ecological, Physiological, Asynchrony, Induced, Genetic, Antixenosus, Antibiosis and Tolerance; Factors of resistance; Genetic basis of resistance; Effect of environment on resistance; Biotypes and resistance; Measurement of resistance; Development of resistant varieties; Role of entomologists in breeding for resistance.

Practical:
Testing and measurement of relative plant resistance to insects.

Books Recommended:
Ent-506  Classification of Adult Insects  3(2-2)

Theory:
Introduction; Types of classification; phylogenetic affinities of different orders; classification of insect orders up to family level, with particular reference to insects of Pakistan.

Practical:
Assessment of existing phylogenetic arrangement of insect orders; Collection and identification of insects up to family level with the help of taxonomic keys.

Books recommended:

Ent-507  Beneficial Insects  3(2-2)

Theory:
Introduction; Insects of medicinal and aesthetic value; Insect pollinators, scavengers, entomophagous and weed feeding insects; Entomological industries: apiculture, sericulture and lac-culture.

Practical:
Practical instructions in apiculture, sericulture and lac-culture; Collection and identification of pollinators, scavengers, entomophagous, medicinal, weed feeding and other beneficial insects.

Books Recommended:


Ent-508 Stored Product Entomology 2(1-2)

Theory:
Introduction; Storage principles; Types of storage; Factors affecting grain in storage; Stored grain losses and their prevention; Identification, biology and control of different stored grain pests.

Practical:
Demonstration of sampling methods and estimation of losses; Collection, identification and control of different stored grain pests.

Books Recommended:
Ent-509  Household Insect Pests  2(1-2)

Theory:
Introduction; Identification, biology and control of different household pests like ants, termites, cockroaches, silver-fish, house flies, crickets, mosquitoes, powder-post and carpet beetles, cloth-moths, psocids, lice, bed-bugs, and fleas.

Practical:
Collection, identification and demonstration of control of different household insect pests.

Books Recommended:

Ent-510  Range and Forest Entomology  2(1-2)

Theory:
Importance of range and forest entomology in range lands and forest ecosystems; Insect pests of range and forest trees; Identification, distribution, host plants, biology, mode of damage and control. Competing and complementary role of insects with range livestock.

Practical:
Collection, Preservation and Identification of insect pests of Range and Forest Trees. Practical study of mode of damage and demonstration of Control Methods.

Books Recommended:
Ent-601 Pest Forecasting and Management 4(2-4)

Theory:
Introduction; Population sampling; Population fluctuation & its measurement; Different methods of pest scouting & forecasting; Principles & requirements of Pest Management; Losses caused by insect pests to different crops; Methods of control: cultural, physical, mechanical, legislative, chemical, biological, microbial & genetical alongwith antimetabolites, feeding deterrents, hormones and pheromones; Concept of Integrated Pest Management (IPM); Economics of pest management.

Practical:
Demonstration of cultural practices and different methods of pest scouting and forecasting; Nature and extent of damage; Assessment of crop losses by different methods; Determination of economic threshold of insects on different crops; identification of important bio-control agents; Installation of light and pheromone traps; Computation, preparation and field application of insecticide formulations; Familiarity with irradiation techniques.

Books Recommended:

Ent-602 Internship 20(0-40)
Ent-603  Insect Ecology and Behaviour  4(3-2)

Theory:
Introduction; Divisions of ecology; Habitat and niche; Intra and inter-specific interactions; Natural and agro-ecosystems; Flow of energy in ecosystem; Trophic relations: Food chain, food web and food mesh concepts; Ecological succession; population and its characteristics; Introduction to life tables. Types of behaviour: reflexes, kineses and taxes; learning; Periodicity; Patterns of behaviour; communications: Aisual, auditory, tactile, chemical. Territoriality; Control of behaviour: nervous, endocrine and genetic; biological functions of behaviour: host finding, feeding and reproductive; escape, defence, offence and predation; Dispersal and migration; Dormancy.

Practical:
Maintenance and measurement of Temperature, Humidity and light with different instruments; population estimation and construction of life tables. Study of types and patterns of insect behaviour under laboratory and field conditions.

Books Recommended:

Ent-605  Insecticides and Their Application  3(2-2)

Theory:
Introduction; Nomenclature, classification, formulations, compatibility, physico-chemical properties, mode of action, residues, hazards and safety measures of insecticides; Structure and working of various types of hand and power operated equipment for insecticide application.
Practical:
Computation, Preparation and Field Application of different formulations of insecticides; identification, Classification, Handling and Maintenance of Application Equipment.

Books Recommended:

Ent-607 Insect Natural History 3(2-2)

Theory:
Introduction; Evolution of phytophagous insects; Insect adaptations in various geographical regions; Insect adaptive radiation and diversity; Sonification insect associations; Solitary, gregarious, sub-social, and colonial; Boring; Leaf-mining, Leaf-rolling, Gall-forming; Litter inhabiting; Subterranean; Terrestrial; Aquatic; Acrial; Iest-building and case-making insects.

Practical:
Collection and identification of solitary, gregarious, sub-social, social, colonial, boring, leaf-mining, leaf-rolling, gall-forming, litter-inhabiting, subterranean, terrestrial, aquatic, aerial, nest-building and case-making insects; study of adaptations in insects; demonstration of auditory and sound producing organs.

Books Recommended:

**Ent-609  Project Planning and Presentation  2(1-2)**

**Theory:**
Entomological literature; Internet Sources of entomological information; layout of experiment; collection; tabulation, analysis and interpretation of research data; instruction in research paper monograph and catalogue writing.

**Practical:**
Library exercises in internet sources of Entomological information; collection and analysis of data on field experiment.

**Books Recommended:**

**Ent-611  Agriculture & Environmental Pollution  3(2-2)**

**Theory:**
Introduction; General concept of pollutants; Sources and nature of pollutants; Environmental deterioration, its effect on agriculture; Green house effect; Types of pollution with reference to agriculture and forestry; Effect of pollution on soil, water, air, plants, living organisms, etc.; management of pollution.

**Practical:**
Identification and determination of sources of pollution in various substrates.

**Books Recommended:**


Annexure-XII: Detailed Course Contents of M.Sc. (Hons) and Ph.D in Entomology

ENT–701 RESEARCH METHODS IN ENTOMOLOGY  4(1-6)

THEORY:

Introduction; techniques and apparatus employed in entomological research: temporary and permanent mounts, microtomy, use of camera lucida, micrometry and scientific photography; bio-assay for insecticide residues; use of Potter's tower, atomic absorption spectrophotometer, gas chromatography, high performance liquid chromatography, ultraviolet visual spectrophotometer, amino acid analyser, electrophoresis, ultra centrifugation, scanning and transmission, electron microscopy and computer software in entomology; methods of sampling, analysis of data and report writing.

PRACTICAL:

Insect collection apparatus and preservation techniques; rearing and culturing; exercises in microtomy, permanent slides, micrometry and scientific photography; maintenance and measurement of microclimate; use of different equipments in entomological experiments, sampling, tabulation, analysis and interpretation of data.

BOOKS RECOMMENDED:

ENT-702  ENVIRONMENTAL ENTOMOLOGY  2(2-0)

THEORY:

Introduction; diversity and stability of insects in different environments; interactions of various groups of insects with biological, chemical and physical constituents of their environment; physical and chemical characterization of environmental contaminants, impact of pollutants on insects and non-target organisms at different levels; biological responses to pollutants and biogeochemical cycles; insects as indicators of levels of pollution. Insects as environment cleaners and soil builders.

BOOKS RECOMMENDED:

ENT 703  ADVANCED INSECT PHYSIOLOGY  3(2-2)

THEORY:

Introduction; advances in physiology of integument, growth, development, diapause, digestion, respiration, circulation, excretion, reproduction, reception and perception; neuromuscular physiology; physiology of locomotion and resistance; hormones, pheromones and light production.

PRACTICAL:

Hormonal control of insect growth, development and breaking of diapause; estimation of digestive enzymes. Oxygen consumption, carbon dioxide production and determination of respiratory quotient. Qualitative and quantitative analysis of haemocytes and free amino acids in haemolymph; determination and estimation of blood proteins, uric acid in excreta and water loss; pheromones as sex attractants; determination of visual, gustatory/olfactory responses and wing beat frequency.

BOOKS RECOMMENDED:
7. Tonapi, G.T., 1994. Hxperimental Entomology; An Aid to Laboratory and Field Study. CBS, Publisher; India.

ENT-704 MICROANATOMY AND HISTOLOGY OF INSECTS 2(0-4)

PRACTICAL:
Use of microtome and other apparatus in the study of microanatomy and histology of insects. Fixation and fixatives. Nuclear and cytoplasmic stains. Preparation of temporary and permanent mounts of various body parts and study of histological structure.

BOOKS RECOMMENDED:

ENT-705 ADVANCED FOREST ENTOMOLOGY 3(2-2)

THEORY:

PRACTICAL:
Collection, preservation and identification of insect groups damaging forest plantations. Development of pest management systems for insects attacking forest trees.
BOOKS RECOMMENDED:

ENT–706 INSECTS OF MAN AND ANIMALS 3(2-2)
THEORY:
Scope of Medical Entomology. Insects and other arthropods of medical and veterinary importance., their biology and control measures. Management strategies for major insects attacking man and domestic animals. Important diseases of man and animals where insects act as vectors.

PRACTICAL:
Collection, identification and control of different arthropod pests in relation to the diseases of man and domestic animals.

BOOKS RECOMMENDED:

ENT–707 CLASSIFICATION OF IMMATURE INSECTS 4(2-4)
THEORY:
Introduction; collection and preservation of immature stages of insects; preparation of immature insects for identification; identification and classification of immature stages of Ephemeroptera, Plecoptera, Odonata, Diptera, Lepidoptera, Trichoptera, Hymenoptera, Neuroptera and Coleoptera up to family level.
PRACTICAL:

Collection, preservation, preparation and identification of immature stages up to family level.

BOOKS RECOMMENDED:

ENT-708 INSECT PEST MANAGEMENT SYSTEMS 3(2-2)

THEORY:

The pest management concept. Ecological considerations for the collection of data for the management of pest populations. The economics of pest management. Pest management strategies for insects attacking different crops grown in barani tracts of Pakistan. Transgenic and genetically modified crops, insects growth regulators, allelopathy, remote sensing and other currents, development in suppressing insect pests.

PRACTICAL:

Estimation of losses done by insects to various crop plants. Demonstration of pest scouting techniques for insects attacking different crops grown in barani areas. Development of pest management systems for key pests of major crops.

BOOKS RECOMMENDED:

ENT-709 ADVANCES IN HOST PLANT RESISTANCE 3(2-2)

THEORY:

Types and classification of resistance. Physio-chemical basis of plant resistance against insects. Epidemiological types of resistance. The use of plant and insect models in host plant resistance. Germplasm sources and needs. Techniques for screening different plant strains (especially in barani areas) showing resistance to insect pests. The relationship of resistant variety development to biotechnology.

PRACTICAL:
Demonstration of techniques for screening crop plants showing resistance to insect pests. Testing of mechanisms of host plant resistance under laboratory and field conditions.

BOOKS RECOMMENDED:

ENT–710 INSECT TOXICOLOGY 3(2-2)

THEORY:

Introduction; general concepts of insect toxicology; theory and principles of bioassay; classification of insecticides on the basis of chemical nature and mode of action; chemistry and comparative toxicology of some common insecticides from each group; mechanism of action of major groups of insecticides; phytotoxicity of insecticides; energy production and inhibition by insecticides at various levels; detoxification mechanisms; joint action of insecticides, (synergism and antagonism).

PRACTICAL:
Laboratory equipment used in toxicology experiment; gross symptoms produced by representative insecticide groups; relationship between dosages and responses; use of
time-mortality determination in comparing the relative toxicity of insecticides; preparation of
spectral transmittance and concentration transmittance curves; chemical assay of insecticides.

BOOKS RECOMMENDED:

   Academy, Udaipur.
   Mode of Action and Uses in Crop Protection. BLRS/Macmillan, U.K.
3. Ishaaya, I. and D. Deghecle, 1998. Insecticides With Novel Modes of Action:
   Mechanism and Application. Norosa Publishing House.,'New Delhi, Madras, Bombay,
   Calcutta, London.
   Y., London.
   London.
   New York, Rheine.

ENT-711 INSECTS IN RELATION TO PLANT DISEASES 3(2-2)

THEORY:

Introduction; identification, biology and control of insect and mite vectors; mode of
transmission of plant pathogens by insects and mites; study of causal organisms, etiology,
symptoms and control of important fungal, bacterial and viral diseases of crop plants
transmitted by insects and mites.

PRACTICAL:

Identification of insect and mite vectors and pathogens; rearing and handling of insect
vectors for plant pathological studies. Study of mode of transmission of plant pathogens by
insect and mite vectors.
BOOKS RECOMMENDED:

ENT-712 INSECT CYTOGENETICS  3(2-2)

THEORY:
Introduction, cell structure, characteristics and cell division in insects, chromosomes structure, number, diversity and types in insects; chromosomes and parthenogenesis in insects; chromosomes and ecology; modern concept of gene; genedetermined characters; environmental effect on gene expression; sex determination in insects; mutations and variations; genetic engineering; evaluation and speciation in insects.

PRACTICAL:
Study of insect cell, cell division, types and number of chromosomes in important insects like grasshoppers, crickets, cockroaches, flies and dragonflies; study of insect resistance in genetically engineered crops; study of different types of genetic variations in insects; genetical identification of species and biotypes in insects.

BOOKS RECOMMENDED:
ENT-713 INSECT PATHOLOGY 3(2-2)

THEORY:

Introduction; history definition and scope; resistance and immunity in insects; types of insect pathogens; transmission, host range/persistence and virulence of insect pathogens; types of injuries and methods of infection by pathogens in insects; pathogenic diseases and their diagnosis in insects; extra-cellular and intracellular microbiota of healthy insects; control of microbial diseases of useful insects; role of pathogens in IPM of insects.

PRACTICAL:

Isolation, purification, culture and identification of insect pathogens from the diseased insects; diagnosis of different pathogenic diseases in insects; control of microbial diseases of useful insects: control of insect pests with microbial insecticides; determination of extent of parasitism by pathogens in insects.

BOOKS RECOMMENDED:


ENT-714 INSECT BIOCHEMISTRY 3(2-2)

THEORY:

Introduction; energy metabolism and production in insects; biochemistry of cuticle, muscles, flight, synaptic transmission, light production, biochromes, hormones; insect growth regulators and diapause in insects; metabolism and role of carbohydrates, proteins and lipids in insects; chemical reactions involved in insect resistance to insecticides, chemical control of insect behaviour; biochemical defences in insects.

PRACTICAL:

Chemical identification of insect species and biotypes; pheromone extraction, its identification and control in insects; hormonal control of insect growth and development.
BOOKS RECOMMENDED:

ENT-715  COMPARATIVE INSECT EMBRYOLOGY  3(2-2)

THEORY:
Introduction; structure of insect egg, fertilization of egg; early organization and development; segmentation; development of organs and organ systems; study of comparative embryology indifferent groups of insects.

PRACTICAL:
Identification of different types of insect eggs; structure of an insect egg, study of cleavage, Blastodein germ band, embryonic envelopes and blastokins different eggs; study of insect embryo at different durations.

BOOKS RECOMMENDED:

ENT-716  BIOLOGICAL CONTROL OF INSECT PESTS  3(2-2)

THEORY:
Introduction; history, development and scope of biological control with special reference to Pakistan; ecological basis of biological control; biological characteristics of emomophagous insects; introduction, culture, release and establishment of entomophagous
insects; conservation and augmentation of natural enemies; role of micro-organisms in biological control; integration of chemical and biological control.

**PRACTICAL:**

Collection, laboratory rearing, culturing and identification of parasitoids, predators and micro-organisms of economic importance; study of extent of parasitism / predation of different biocontrol agents.

**BOOKS RECOMMENDED:**


**ENT-719 SPECIAL PROBLEM 1(1-0)**
**ENT-720 SEMINAR 1(1-0)**

**INSTITUTIONAL FACILITIES**

The institution must have the infrastructure to support new trends in learning such as e-learning

- Electronic library books and journals are available for learning purpose.
- Insufficient facilities regarding the infrastructure to support new trends in learning are prevalent
- The library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personnel.
- In sufficient library’s technical collection of books
- Recommended books, relevant journals of the programs are not available to the students
- However, this aspect needs to be strengthened in number and space.

Class rooms must be adequately equipped and offices must be adequate to enable faculty to carry out their responsibilities.