Self Assessment Report
3\textsuperscript{rd} Cycle (2010-2012)
B.Sc. (Hons) Program

DEPARTMENT OF SOIL SCIENCE & SWC

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Dr. Muhammad Akmal (Member)
Dr. Shahzada Sohail Ijaz (Member)
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INTRODUCTION

The Department of Soil Science and Soil & Water Conservation in the Faculty of Crop & Food Sciences at Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi is a multidisciplinary academic unit having teaching and research. The Department began as separate soil science and Soil & Water Conservation entities in 1979, which was transformed in 1995 but have always maintained broad array of programs that deals with Soil & Water Conservation, Soil Fertility & Cropping Systems and issues of importance to pothwar region. The department’s strength is its ability to seek solutions to problems that require the integration of disciplines and collaboration of researchers and educators.

The Department have eleven faculty members; 2 Professors, 3 Associate Professors, 5 Assistant Professors and 2 Lecturers. Nine out of eleven faculty members are Ph.D. The Department offers undergraduate and post-graduate studies. Till now, 297 students have graduated as B. Sc. (Hons.) Agric. At present 40 BSc (Hons) students are studying for their degrees.

Presently deparmental faculty has published very strong resume with reference to international publications and impact factor in addition to national publication publications. It holds national and international seminars to exchange knowledge and views.
Criterion 1: 
PROGRAM MISSION, OBJECTIVES AND OUTCOMES

Vision: The mandate of the university is to produce high quality agricultural scientists and to form an organized scientific infrastructure for teaching for the development of dry land regions of the country, thus minimizing the income gap between rich and poor. The department of Soil Science & SWC follows this vision.

Mission: To attain excellence in teaching by continual monitoring and evaluation through feedback of faculty members and students, to develop quality in research especially of rainfed areas by addressing the issues of low soil fertility, and soil/water erosion, and to generate professional Soil Science research scientists to serve in public and private sectors.

Values:
- Credibility as a source of reliable, research-based information and education.
- Responsiveness to the needs of those we serve.
- Effective communication within the department and university.
- Effective teamwork and coordination within our department and with colleagues.
- Accountability for the wise use of human, fiscal and physical resources entrusted to us.
- Ability to learn from past experience and to develop innovative solutions to problems.
- Recognition of diversity in all its forms and a commitment to create an environment of mutual understanding and respect.

Goals and Strategies:
Three areas of planning and organizational activities will be emphasized over the next report period: 1) Curriculum development 2) Research projects and 3) Faculty and Staff Enrichment.

Goal 1: Curriculum Development
Rationale: Natural resource issues are at the forefront of societal concerns in Punjab, across the Pakistan and around the world. Issues include agricultural sustainability, global warming, soil and water quality, soil erosion, and food security to name but a few. Students trained in soil science discipline can play critical roles in helping society address many of these problems. We must be sure that we have up-to-date curricula at both undergraduate and graduate levels to
meet these training needs and to be sure that students are aware of the career opportunities that exist in these areas of study.

**Implementation Strategy:** The curriculum for undergraduate and graduate students is prepared to achieve professional positions in industry, private and public sectors. Our goal is to strive for excellence in teaching, both in the array of courses available to our students and in the delivery of course materials. At the core of these efforts is our curriculum committee’s constant review of the courses and curriculum options we offer to ensure their relevance, eliminate unnecessary duplication, delete courses no longer needed and develop new courses or curricular options as current issues and student interests mandate change. We will ensure that learning objectives are explicitly stated for all of our courses and we will develop means to evaluate the effectiveness of those objectives as the class is being taught and after the class is completed. We recognize the importance of good writing in students’ educations and we will look specifically for ways to teach writing skills in all of our classes. We will continue to support teaching excellence through peer evaluation. We will encourage student involvement in interdisciplinary programs to give students the opportunity to learn to work across disciplinary boundaries.

**Goal 2: Research Projects**

**Rationale:** Soil Science & SWC faculty conduct research activities across an array of sciences. Faculty do valuable work at ranges from applied to the most basic. Most activity has or will have an application in Pothwar natural resource systems but time scales differ significantly. Our best graduate training programs are most often linked to our best research programs.

**Implementation Strategy:**
Projects are headed by a faculty member and are most often focused on a specific disciplinary area. The types of activities done within each project – applied research, basic research, teaching, public service – will be identified. This information will be presented in both descriptive and diagrammatic form and made available in printed and electronic formats, the latter will be available on our department web site.

**Goal 3: Faculty and Staff Enrichment**
People are our greatest source. We need to assure that faculty and staff have on-going training and support to make them as productive as possible.
Standard 1.1: The program must have measurable objectives to support mission

Documented Measureable Objectives:
Strategic objectives of the department are as below:

1. To develop Soil Science & SWC discipline on modern and innovative lines for teaching and research for the graduate and post-graduate students.
2. To impart basic and applied high quality knowledge and skills in the field of Soil Science & SWC applying highly advanced analytical techniques.
3. To guide students and conduct research on soil, crop and water issues.
4. To anticipate new problems in the field.

Main Elements of Strategic Plan to Achieve Mission and Objectives:

1. Development of a sound teaching system based on the experience and vision gathered from world reviews, literature, innovations, proceedings, symposia etc for the award of degrees.
2. Designing and constantly updating the curricula involving core subjects, elective subjects, specialized areas, internship programs and study tours.
3. Setting up of well equipped specialized research laboratories depending on the available resources.
4. Publication of scientific papers, books, manuals etc.
5. Implementation of research projects funded by the universities and other agencies.
6. Development of linkages with national and international research organizations to foster research.

The assessment of different program objectives through different criteria is presented in Table 1.
<table>
<thead>
<tr>
<th>Sr. #</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>Development &amp; strengthening of Soil Science &amp; SWC discipline at PMAS-AAUR</td>
<td>On the basis of recognition of soil problems/issue in the area and determining their impact</td>
<td>It is a continuous process as per requirement</td>
<td>Teaching method needed to be improved</td>
<td>Teaching method was revised on modern lines</td>
</tr>
<tr>
<td>2</td>
<td>To impart basic and applied knowledge to the graduate and Post-graduate students</td>
<td>Background information and status of knowledge of students through entry tests and student feedback</td>
<td>At the time of examination</td>
<td>Some basic courses need to be included in the curriculum</td>
<td>Revision of curriculum as per requirement</td>
</tr>
<tr>
<td>3</td>
<td>Guidance to students in research / internship</td>
<td>Assessing interest and feedback of students</td>
<td>Before start up projects</td>
<td>Students to make presentations and reports</td>
<td>Presentations, seminars, communication skill development</td>
</tr>
<tr>
<td>4</td>
<td>To anticipate new problems in the field</td>
<td>Through entry tests, interviews research own interest</td>
<td>Subject / courses selection before start</td>
<td>Related subjects to be recommended for studies</td>
<td>Enhancement of knowledge and vision</td>
</tr>
</tbody>
</table>
Standard 1.2: The program must have documented outcome of graduating students

Program Learning Outcomes:
- Revision of teaching methods on modern lines.
- Revision of curriculum as per policy of Higher Education Commission.
- Presentations, seminars, communication skill development.
- Enhancement of knowledge and vision.
- Approval of new curriculum integrated approaches.

Questionnaire surveys were conducted to assess program outcomes of the department graduates for BSc (Hons) Table 2.

Table 2: Relationship of program objectives with program outcomes

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>+++</td>
</tr>
<tr>
<td>2</td>
<td>++</td>
</tr>
<tr>
<td>3</td>
<td>+++</td>
</tr>
<tr>
<td>4</td>
<td>++</td>
</tr>
</tbody>
</table>

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

The program outcomes are fully supportive to program objectives mentioned above. Outcomes are based on actual details obtained from department documents.
PROGRAM ASSESSMENT RESULTS
(Proformae 1 & 10)

Assessment results of B.Sc. (Hons) program for two years i.e., 2008-09 and 2009-10 comprising four semesters commencing from Fall 2008 to spring 2010 are summerized and illustrated below.

Fall 2010
Teacher Evaluation

Dr. Muhammad Akmal (SS-301)
Comments/suggestions
Teacher is dedicated and conveys the knowledge effectively. He is very friendly and gives respect to the students.

Prof. Dr. M. Azhar Naeem (SS-501)
Comments/suggestions
His attitude was very positive and inspired interest.
Dr. S. Sohail Ijaz (SS-503)

Comments/suggestions

He has a really great attitude toward students - interested in making sure we're learning.
Dr. M. Tariq Saddique (SS-505)

Comments/suggestions
Professor had a great attitude for students. He was very engaged and interested in student's learning.

![Teacher Evaluation SS-505, Fall 2010](image)

**Figure-4: Teacher Evaluation SS-505, Fall 2010**

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Dr. Arshad Nawaz (SS-507)

Comments/suggestions
He had very positive attitude. He was very concerned about students' understanding of topic.
Dr. M. Akmal (SS-509)

Comments/suggestions

We are satisfied for what the teacher had delivered in all of the lectures. His teaching method is fine. He has a good hold of class.
Dr. Ghulam Jilani (SS-601)  

Comments/suggestions  
He is very open to students. Teacher demonstrated concern lecture for learning effectively. I admire his friendly attitude.

![Teacher Evaluation SS-601, Fall 2010]

**Figure-7: Teacher Evaluation SS-601, Fall 2010**

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Dr. Riaz Ahmad (SS-603)  

Comments/suggestions  
Instructor offered frequent class hours. He is very dedicated and has strong hold of his subject.
Mr. Tanveer Iqbal (SS-605)

Comments/suggestions

He is very nice and friendly teacher. I am impressed by his regularity in the class.

Figure-8: Teacher Evaluation SS-603, Fall 2010
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Figure-9: Teacher Evaluation SS-605, Fall 2010
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree
Dr. Khalid S. Khan (SS-607)

Comments/suggestions
Teacher is very committed with his lecture delivery. I like his teaching style very much. He is very regular in class and gives respect to the students.

![SS-607 Evaluation Figure](image)

**Figure-10: Teacher Evaluation SS-607, Fall 2010**
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Dr. Rifat Hayat (SS-609)

Comments/suggestions
He taught in a way that was easy to understand and encouraged students to participate. His attitude towards students was great.
Course Evaluation

Course Evaluation (SS 301)

Comments/suggestions

This course was effective and provided useful knowledge about the basic properties of soil.

Figure-11: Teacher Evaluation SS-609, Fall 2010
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Figure-12: Course Evaluation SS-301, Fall 2010
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree
Course Evaluation (SS-501)

Comments/suggestions

The course was interesting and well organized. This course facilitates the understanding of basic knowledge of soil physical properties.

Figure-13: Course Evaluation SS-501, Fall 2010

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Course Evaluation (SS-503)

Comments/suggestions

This course was difficult, but teacher made it interesting and easy. Course was informative.

Figure-14: Course Evaluation SS-503, Fall 2010

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree
Course Evaluation (SS-505)

Comments/suggestions
The course was easy to understand. The contents of the course were advanced and useful.

Evaluation (SS-507)

Comments/suggestions
The course helped to improve our knowledge soil formation processes and soil morphology. Course contents were well organized.

Figure-15: Course Evaluation SS-505, Fall 2010
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Figure-16: Course Evaluation SS-507, Fall 2010
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree
Course Evaluation (SS-509)

Comments/suggestions
Course knowledge was quite updated. Soil classification is difficult course. I liked this course as it was interesting and informative.

Figure 17: Course Evaluation SS-509, Fall 2010
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Course Evaluation (SS-601)

Comments/suggestions
The course was well structure and organized. Course was quite lengthy.
Course Evaluation (SS-603)

Comments/suggestions

Course was difficult, though teacher made it easy. Course was completed in time.
Course Evaluation (SS-605)

Comments/suggestions

The course was informative and useful. I enjoyed the learning of this course.

![Course Evaluation SS-605 Chart]

Figure-20: Course Evaluation SS-605, Fall 2010

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Course Evaluation (SS-607)

Comments/suggestions

This is useful but difficult. The course is well planned and contents are advanced.
Course Evaluation (SS-609)

Comments/suggestions

I found the course interesting, well updated and useful. The course is quite demanding.
Spring 2011
Teacher Evaluation

Dr. M. Tariq Siddique (SS-502)
Comments/suggestions
Teacher is very hardworking and dedicated. He is enthusiastic both about the subject he taught and about teaching.

![Bar Chart for SS-502]

Figure-23: Teacher Evaluation SS-502, Spring 2011
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Mr. Arshad Nawaz (SS-506)
Comments/suggestions
He is very enthusiastic and student friendly teacher. He is very polite.
Dr. M. Akmal (SS-508)

Comments/suggestions

This teacher explained the case studies in an easily understandable way. His passion and enthusiasm for teaching and for the subject made his classes lively and helpful.
Dr. Rifat Hayat (SS-510)
Comments/suggestions
He is hardworking and punctual teacher. His ways of teaching is so impressive and give advance information about the course. His positive, cheerful attitude made learning easier and more interesting.

Figure-26: Teacher Evaluation SS-510, Spring 2011
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

(SS- 602)
Comments/suggestions
He is hardworking and punctual teacher. His way of teaching is impressive. Positive, cheerful attitude made learning easier and more interesting.
Course Evaluation

Course Evaluation (SS-502)

Comments/suggestions

This course was very well planned out and thorough in the materials. I learned much of information from this course. We found interesting and enlightening because it contains practical and useful knowledge about salt affected soil and their management.
Comments/suggestions (SS-506)
This course provided useful information regarding soil and water conservation technologies as well as soil erosion and its management techniques. During this course overall environment of classroom was conducive to learn.

![SS-506 Evaluation Chart]

**Figure-29: Course Evaluation SS-506, Spring 2011**

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Comments/suggestions (SS-508)
This whole course was useful for practical work because in this course we learnt basic techniques commonly used in lab and gain practical knowledge with the interesting concepts and materials covered in class. The lectures of this course provided valuable information. I got much of knowledge from this pure practical course.
Comments/suggestions (SS-510)

This was very interesting and valuable course. All the concepts of this course were informative and practical. We found this course easy to follow because this course inspired me much more as compared to others. Course related to recent issues and achievement in the field soil microbiology. I learned a lot in this course.
Comments/suggestions (SS-602)
The course was made informative by several laboratory visits. Basic knowledge of laboratory techniques was well known in this course. It was a totally practical and research oriented work. We got valuable information during the course.

![Course Evaluation SS-602, Spring 2011](image)

**Figure-32: Course Evaluation SS-602, Spring 2011**

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

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Fall 2011

**Teacher Evaluation**

Dr. Muhammad Akmal (SS-301)

**Suggestions/comments**

He clearly taught what was applicable to understand the subject. His teaching style is so impressive and easily understandable. He always showed a great attitude towards students and easily accessible. He reaches the class on time.
Figure 33: Teacher Evaluation SS-301, Fall 2011
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Dr. S Sohail Ijaz (SS-401)
Suggestions/comments
He is interesting character for all the students. He made himself accessible for every student. He seemed to really care about students learning. Very concerned about student's well-being in the course.

Figure-34: Teacher Evaluation SS-401, Fall 2011
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree
Dr. Muhammad Akmal (SS-501)

Suggestions/comments
He is available to every student outside of class and in his office. He seemed to really care about students learning.

![Figure 35: Teacher Evaluation SS-501, Fall 2011](image)

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Dr. Qaiser Hussain (SS-503)

Suggestions/comments
Teacher always made sure students understood concepts. He is available for question and discussion outside the class. He cares about our learning and our opinions. He always considers as well wisher to all students.
Figure 36: Teacher Evaluation SS-503, Fall 2011
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Dr. M. Tariq Siddique (SS-505)
Suggestions/comments
He is caring teacher. His attitude was very positive with all students. Instructor was very concerned with student problems. He was responsive to any suggestions of students.

Figure-37: Teacher Evaluation SS-505, Fall 2011
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree
Mr. Arshad Nawaz (SS-507)

Suggestions/comments

Instructor was very concerned with student understanding. He was available every time. He was responsive to any suggestions of students. His attitude was very positive with all students.

Dr. Ghulam Jilani (SS-601)

Suggestions/comments

This professor did good job of explaining course content and making it interesting and enjoyable. Good straight forward explanations. His style of teaching is really great.
Figure-39: Teacher Evaluation SS-601, Fall 2011
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Prof. Dr. Riaz Ahmad (SS-603)
Suggestions/comments
I highly like his teaching method. He always reaches class in time and creates a best environment for study during class. We got lot of information about course.

Figure-40: Teacher Evaluation SS-603, Fall 2011
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree
Mr. Tanveer Iqbal (SS-605)

Suggestions/comments

He was very friendly, and always wanted to help. He was extremely receptive to the students. Teacher had very engaging lectures. He explained clearly and effectively.

![SS-605 Evaluation Chart]

**Figure-41: Teacher Evaluation SS-605, Fall 2011**

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

**Course Evaluation**

Comments/suggestions (SS-301)

This course was very interesting and conceptual. This course inspired me much. Course was easy and understandable. This was informative course. New ideas related to the course. Sufficient and recent advance knowledge was presented in the class.
Comments/suggestions (SS-401)

This Course is very informative about laboratory techniques. This course is difficult but interesting because in laboratory techniques much of time is consuming. Lectures and assignment were given on time.
Comments/suggestions (SS-501)

This Course is very interesting, understandable and informative about physical properties of soil. Course is easy and entertaining. More field tours, more emphasis should be on Pakistan.

![Course Evaluation SS-501, Fall 2011](image)

Figure 44: Course Evaluation SS-501, Fall 2011

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Comments/suggestions (SS-503)

This course was difficult but interesting. This course gives the information about chemical properties of soil. Instructor provided a clear overview of course content. He established a nice relationship between theory and practice. He completed the whole course in time.
Comments/suggestions (SS-505)

Teacher organized course content clearly. This course was understandable and informative. Lectures, assignments, notes and practical material were given in proper way.
Comments/suggestions (SS-507)
This course was interesting. Questions and discussion about the course was on regular basis. Teacher organized course content clearly.

![Course Evaluation SS-507, Fall 2011](chart.png)

**Figure-47: Course Evaluation SS-507, Fall 2011**

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Comments/suggestions (SS-601)
This course was very informative and understandable. I really got some new and valuable information about different soil processes and reactions. The whole course was managed properly.
Figure-48: Course Evaluation SS-601, Fall 2011

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Comments/suggestions (SS-603)

Course contents were well designed and completed in time. This course was very interesting and gave the information about soil and water status and their related environmental problems. Teacher was most enthusiastic about this course. He gave the chance to all students to participate in discussion.

Figure-49: Course Evaluation SS-603, Fall 2011

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree
Comments/suggestions (SS-605)
The best aspects of this course included the interesting materials covered in the course, and how latest innovative soil and plant techniques are being used in the field of soil and plant analysis. I found this course very practicable. The whole course was managed properly and well organised materials.

Figure-50: Course Evaluation SS-605, Fall 2011
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Spring 2012
Teacher Evaluation

Dr. Muhammad Akmal (SS-402)
Comments/suggestions
He was enthusiastic both about the subject he taught and about teaching. His enthusiasm made learning the material easier. Instructor was polite and friendly towards students.
Dr. Qaiser Hussain (SS-508)

Comments/suggestions
Teacher is very hardworking and dedicated. He is regular in class and his method of teaching is very good. Instructor was so polite, thank you for being so positive, and for being excited to answer our questions and also open discussion.
Dr. M. Tariq Siddique (SS-502)

Comments/suggestions
Instructore is very nice and humble. His lectures were informative and full of knowledge.

![Teacher Evaluation SS-502, Spring 2012](image)

Figure-53: Teacher Evaluation SS-502, Spring 2012
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Dr. Arshad Nawaz (SS-504)

Comments/suggestions
Teacher is friendly with students and his communication skill is impressive. He encourages the students to participate actively in class.
Mr. Arshad Nawaz (SS-506)

Comments/suggestions

His teaching style is student friendly. He always provides a friendly environment for question and discussion with students.
Dr. Khalid Saifullah Khan (SS-602)

Comments/suggestions

His teaching style is amazing. His organization, clarity, and grasp of the material were impressive. He has a good hold of class.

Figure-56: Teacher Evaluation SS-602, Spring 2012

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Dr. M. Tariq Siddique (SS-604)

Comments/suggestions

He is hardworking and friendly teacher. He provides such a learning environment in which every student can participate in open discussion.
Dr. Muhammad Umer (SS-606)

Comments/suggestions
Instructor is very keen on student learning, strove to be available. His teaching style is effective. He is hardworking and friendly teacher.
Dr. Rifat Hayat (SS-608)

Comments/suggestions
He has a good hold of class. He is hardworking and friendly teacher. His method is so impressive which inspired all the students.

Figure-59: Teacher Evaluation SS-608, Spring 2012
A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Course Evaluation

Course Evaluation (SS-402)
Comments/suggestions
The course was interesting and well organized. Additional learning material was provided which actually further improved subject knowledge.
Course Evaluation (SS-508)

Comments/suggestions

The course was completed timely. This course improved our knowledge regarding basic laboratory techniques, however course contents need to be updated with lastest knowledge.
Course Evaluation (SS-502)

Comments/suggestions

The course was completed timely. This course improved our knowledge regarding salt affected soil and their reclamation methods. This course was managed properly.
Course Evaluation (SS-504)

Comments/suggestions
The course was interesting and informative. This course made me inspired. The course was completed timely.

Course Evaluation (SS-506)

Comments/suggestions
The course was managed properly. The entire course was completed timely. The course was understandable and easy. This course effectively improved our knowledge about water conservation practices and management in context of Pakistan.
Course Evaluation (SS-602)

Comments/suggestions
The course was easily manageable. All the assignment and lectures were accessible. The course contents need to be updated with new knowledge regarding the advanced nuclear techniques in soil research.
Course Evaluation (SS-604)

Comments/suggestions

This course improved our knowledge regarding wind erosion and their management technique. This course tells about the status of wind erosion in Pakistan.
Course Evaluation (SS-606)

Comments/suggestions

The course was completed timely. This course was interesting and informative but course contents need to be updated with lastest knowledge. The course is very important from research point of view. I learned effectively from this course that how to plan and execute the independent research project.

Figure 67: Course Evaluation SS-301, Spring 2012

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree

Course Evaluation (SS-608)

Comments/suggestions

The course was completed timely. This course was quite informative to how we write a research proposal and research related articles.
SS-608

Figure-68: Course Evaluation SS-608, Spring 2012

A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree
Faculty Course Review Report  
(Proforma 2)

The evaluation showed that the faculty is satisfied with curriculum. Evaluation Questionnaire were filled by each faculty member regarding his course and then analyzed and presented in the table given below. The internal evaluation was done through mid and final term examinations for all courses offered by department.

Table 3: Faculty course review report

<table>
<thead>
<tr>
<th>Course code</th>
<th>Title</th>
<th>Credit value</th>
<th>Class</th>
<th>Semester</th>
<th>Assessment Methods</th>
<th>Grades</th>
<th>Course Instructor</th>
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</thead>
<tbody>
<tr>
<td>SS 301</td>
<td>Introduction to Soil Science</td>
<td>3(2-2)</td>
<td>1st</td>
<td>Fall 2010</td>
<td>Mid term and final exam.</td>
<td>26</td>
<td>Dr. M. Akmal</td>
</tr>
<tr>
<td>SS 501</td>
<td>Physical Properties of Soils</td>
<td>3(2-2)</td>
<td>5th</td>
<td>Fall 2010</td>
<td>Mid term and final exam.</td>
<td>38</td>
<td>Dr. M. Azhar Naeem</td>
</tr>
<tr>
<td>SS 503</td>
<td>Chemical Properties of Soils</td>
<td>3(2-2)</td>
<td>5th</td>
<td>Fall 2010</td>
<td>Mid term and final exam.</td>
<td>38</td>
<td>Dr. Shahzada Sohail Ijaz</td>
</tr>
<tr>
<td>SS 505</td>
<td>Soil Fertility and Fertilizers</td>
<td>3(2-2)</td>
<td>5th</td>
<td>Fall 2010</td>
<td>Mid term and final exam.</td>
<td>12</td>
<td>Dr. M. Tariq Siddique</td>
</tr>
<tr>
<td>SS 509</td>
<td>Introduction to soil Classification</td>
<td>3(2-2)</td>
<td>5th</td>
<td>Fall 2010</td>
<td>Mid term and final exam.</td>
<td>34</td>
<td>Dr. Muhammad Akmal</td>
</tr>
<tr>
<td>SS 601</td>
<td>Soil Microbiology and Biochemistry</td>
<td>4(3-2)</td>
<td>5th</td>
<td>Fall 2010</td>
<td>Mid term and final exam.</td>
<td>86</td>
<td>Dr. Ghulam Jillani</td>
</tr>
<tr>
<td>SS 603</td>
<td>Soil and Water Pollutions</td>
<td>3(2-2)</td>
<td>5th</td>
<td>Fall 2010</td>
<td>Mid term and final exam.</td>
<td>28</td>
<td>Dr. Riaz</td>
</tr>
<tr>
<td>SS 607</td>
<td>Nuclear Techniques in Soil Research</td>
<td>3(2-0)</td>
<td>5th</td>
<td>Fall 2010</td>
<td>Mid term and final exam.</td>
<td>28</td>
<td>Dr. Khalid Saifullah Khan</td>
</tr>
<tr>
<td>SS 609</td>
<td>Project planning and Scientific writing</td>
<td>2(1-2)</td>
<td>7th</td>
<td>Fall 2010</td>
<td>Mid term and final exam.</td>
<td>9</td>
<td>Dr. Safdar Ali</td>
</tr>
<tr>
<td>SS 502</td>
<td>Salt Effected Soil &amp; Their Management</td>
<td>3(2-2)</td>
<td>6th</td>
<td>Spring 2011</td>
<td>Mid term and final exam.</td>
<td>24</td>
<td>Dr. M. Tariq Siddique</td>
</tr>
<tr>
<td>SS 506</td>
<td>Water Conservation and Non Conventional Erosion Control</td>
<td>3(3-0)</td>
<td>6th</td>
<td>Spring 2011</td>
<td>Mid term and final exam.</td>
<td>21</td>
<td>Mr. Arshad Nawaz</td>
</tr>
<tr>
<td>SS</td>
<td>Instrumentation and</td>
<td>2(0-4)</td>
<td>6th</td>
<td>Spring</td>
<td>Mid term</td>
<td>5</td>
<td>Dr.</td>
</tr>
</tbody>
</table>

55
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Year</th>
<th>Semester</th>
<th>Exam Type</th>
<th>Midterm</th>
<th>Final</th>
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<th>Midterm</th>
<th>Final</th>
<th>Total</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>SS 508</td>
<td>Library Techniques</td>
<td>2(0-4)</td>
<td>6th</td>
<td>Spring 2011</td>
<td>Mid term and final exam.</td>
<td>5</td>
<td>38</td>
<td>43</td>
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<td></td>
<td>Muhammad Akmal</td>
</tr>
<tr>
<td>SS 301</td>
<td>Introduction to Soil Microbiology</td>
<td>3(2-2)</td>
<td>1st</td>
<td>Fall 2011</td>
<td>Mid term and final exam.</td>
<td>31</td>
<td>34</td>
<td>28</td>
<td>7</td>
<td>0</td>
<td></td>
<td>Dr. Riffat Hayat</td>
</tr>
<tr>
<td>SS 401</td>
<td>Instrumentation and Library Techniques</td>
<td>2(0-4)</td>
<td>6th</td>
<td>Spring 2011</td>
<td>Mid term and final exam.</td>
<td>5</td>
<td>38</td>
<td>45</td>
<td>8</td>
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<td></td>
<td>Dr. Shahzada Sohail Ijaz</td>
</tr>
<tr>
<td>SS 501</td>
<td>Physical Properties of Soil</td>
<td>3(2-2)</td>
<td>5th</td>
<td>Fall 2011</td>
<td>Mid term and final exam.</td>
<td>41</td>
<td>45</td>
<td>14</td>
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<td>0</td>
<td></td>
<td>Dr. Muhammad Akmal</td>
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<tr>
<td>SS 503</td>
<td>Chemical Properties of Soils</td>
<td>3(2-2)</td>
<td>5th</td>
<td>Fall 2011</td>
<td>Mid term and final exam.</td>
<td>37</td>
<td>41</td>
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<td></td>
<td>Dr. Qaiser Hussain</td>
</tr>
<tr>
<td>SS 505</td>
<td>Soil Fertility and Fertilizers</td>
<td>3(2-2)</td>
<td>5th</td>
<td>Fall 2011</td>
<td>Mid term and final exam.</td>
<td>12</td>
<td>40</td>
<td>43</td>
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<td>0</td>
<td></td>
<td>Dr. M. Tariq Siddique</td>
</tr>
<tr>
<td>SS 507</td>
<td>Soil Genesis and Morphology</td>
<td>3(2-2)</td>
<td>5th</td>
<td>Fall 2011</td>
<td>Mid term and final exam.</td>
<td>35</td>
<td>60</td>
<td>5</td>
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<td></td>
<td>Mr. Arshad Nawaz</td>
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<tr>
<td>SS 601</td>
<td>Biochemistry of Soil Processes</td>
<td>3(2-2)</td>
<td>7th</td>
<td>Fall 2011</td>
<td>Mid term and final exam.</td>
<td>53</td>
<td>45</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
<td>Dr. Ghulam Jillani</td>
</tr>
<tr>
<td>SS 603</td>
<td>Soil and Water Pollutions</td>
<td>3(2-2)</td>
<td>7th</td>
<td>Fall 2011</td>
<td>Mid term and final exam.</td>
<td>28</td>
<td>45</td>
<td>27</td>
<td>0</td>
<td>0</td>
<td></td>
<td>Dr. Riaz</td>
</tr>
<tr>
<td>SS 605</td>
<td>Methods of Soil and Plant Analysis</td>
<td>4(2-4)</td>
<td>7th</td>
<td>Fall 2011</td>
<td>Mid term and final exam.</td>
<td>47</td>
<td>24</td>
<td>28</td>
<td>0</td>
<td>0</td>
<td></td>
<td>Mr. Tanveer Iqbal</td>
</tr>
<tr>
<td>SS 402</td>
<td>Soil and Water Conservation</td>
<td>2(2-0)</td>
<td>2nd</td>
<td>Spring 2012</td>
<td>Mid term and final exam.</td>
<td>29</td>
<td>43</td>
<td>20</td>
<td>6</td>
<td>2</td>
<td></td>
<td>Dr. M. Akmal</td>
</tr>
<tr>
<td>SS 508</td>
<td>Instrumentation and Library Techniques</td>
<td>2(0-4)</td>
<td>6th</td>
<td>Spring 2012</td>
<td>Mid term and final exam.</td>
<td>13</td>
<td>45</td>
<td>30</td>
<td>12</td>
<td>0</td>
<td></td>
<td>Dr. Qaiser Hussain</td>
</tr>
<tr>
<td>SS 502</td>
<td>Salt Effected Soil &amp; Their Management</td>
<td>3(2-2)</td>
<td>6th</td>
<td>Spring 2012</td>
<td>Mid term and final exam.</td>
<td>18</td>
<td>36</td>
<td>46</td>
<td>0</td>
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<td>Dr. M. Tariq Siddique</td>
</tr>
<tr>
<td>SS 504</td>
<td>Introduction to soil Classification</td>
<td>3(2-2)</td>
<td>6th</td>
<td>Fall 2011</td>
<td>Mid term and final exam.</td>
<td>42</td>
<td>54</td>
<td>4</td>
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<td>0</td>
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<td>Mr. Arshad Nawaz</td>
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<tr>
<td>SS 506</td>
<td>Water Conservation and Non Conventional Erosion Control</td>
<td>3(3-0)</td>
<td>6th</td>
<td>Spring 2012</td>
<td>Mid term and final exam.</td>
<td>46</td>
<td>54</td>
<td>0</td>
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<td>0</td>
<td></td>
<td>Mr. Arshad Nawaz</td>
</tr>
<tr>
<td>SS 607</td>
<td>Nuclear Techniques in Soil Research</td>
<td>3(2-2)</td>
<td>6th</td>
<td>Fall 2011</td>
<td>Mid term and final exam.</td>
<td>28</td>
<td>29</td>
<td>43</td>
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<td>0</td>
<td></td>
<td>Dr. Khalid Saifullah Khan</td>
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<tr>
<td>SS 604</td>
<td>Wind Erosion and its Control</td>
<td>3(3-0)</td>
<td>6th</td>
<td>Spring 2012</td>
<td>Mid term and final exam.</td>
<td>59</td>
<td>24</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td></td>
<td>Dr. M. Tariq Siddique</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
<td>Term</td>
<td>Exam Type</td>
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<td>Final</td>
<td>Additional</td>
<td>Instructor</td>
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<tr>
<td>-------------</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS 606</td>
<td>Soil Survey and Land Evaluation</td>
<td>3(2-2)</td>
<td>6th</td>
<td>Spring 2012</td>
<td>23</td>
<td>65</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>Dr. Muhammad Umer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS 608</td>
<td>Project Planning, Execution and Scientific Writing</td>
<td>4(0-8)</td>
<td>Spring 2012</td>
<td>Mid term and final exam.</td>
<td>88</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Dr. Rifat Hayat</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SURVEY OF GRADUATING STUDENTS
(Proforma 3)

Survey of graduating students was conducted through Performa 3 before the award of degree. The results exhibited that most of the students were very satisfied and satisfied with regards to various questions. They were particularly satisfied with the infrastructure, environment and curriculum of the department. Percent response to the individual questions is presented in Figure below.

Figure 69. Graduating students’ survey results
ALUMNI SURVEY RESULTS
(Proforma 7)

Feedback of alumni was acquired through Proforma-7 (Fig. 67). Majority of the alumni were of the view that the knowledge regarding science and professional discipline provided to them was satisfactory. They also appreciated the departmental efforts regarding ability to link theory to practical, oral and written communication skills and compliance with ethical values. Question wise results are shown in the graph below.

![Graph showing alumni survey results](image)

Fig. 70. Alumni survey results
EMPLOYER SURVEY
(Proforma 8)

To obtain employer’s point of view about the performance of former students in their organizations, survey was conducted through proforma 8. Majority of employers were of the view that the students that graduated from PMAS-AAUR had very good knowledge of science, ability to link theory to practical, report writing skills, oral presentation and problem solving skills. Overall Figure below indicates good performance of the university graduates.

![Employer Survey Graph](image_url)

**Fig. 71. Employer survey**
Standard 1.3: The department must assess its over all performance periodically

Skills and Capabilities:
Students develop ability to apply knowledge of Soil Science & SWC and work as professionals to build confidence and communicate effectively in writing, oral and demonstration. They use modern tools, techniques and skills for their profession, to formulate and design the experiments/projects and to work effectively in a team, to address soil related problems.

Strength of the Department:
The main strength of the department is the availability of highly qualified teachers, experienced in soil management with respect to agriculture production. Majority of the faculty members have degrees from abroad and are experts in their fields. Number of national and international research project are being run by faculty members.

Weakness Identified in the Program:
Department lacks the facilities of lecture rooms according to the number of courses offered by the department. Facility of green house & wire house is lacked; its availability will help the students to conduct their research projects based on pot experiments more smoothly and successfully with quality output data.

Major Future Improvement Plans:
- Use of update audio visual aids along with modern teaching tools, with access to latest information for quality education in the field of soil science.
- Availability of update published metrial with reference to advisory services. i.e. brochures, pamphlets and hand outs.
- Continual renovation of laboratories with latest sophisticated instruments for quality output research.
- Modernize the process to equip and enable the research students to tackle day to day research oriented issues.
- Capacity building of the faculty through national and international linkages and trainings.
Standard 1.4: The department must assess its overall performance periodically using quantifiable measures

The evaluation process indicated high efficiency of system and satisfactory impact of outcomes (Table 4). Almost all the graduate and post graduates got jobs in various organizations (provincial department, universities, research organizations, banks and private firms).

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>1</td>
<td>B. Sc. (Hons.) Soil Science degrees awarded</td>
<td>297</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>M. Sc. (Hons.) Soil Science degrees awarded</td>
<td>138</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ph. D. (Soil Science) degrees awarded</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Postdoc awarded</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Teacher : Student ratio</td>
<td></td>
<td>Fulfills HEC criteria</td>
</tr>
<tr>
<td>6</td>
<td>Technica l: Non technical ratio</td>
<td></td>
<td>Fulfills HEC criteria</td>
</tr>
</tbody>
</table>

Table 5: Present performance measures for research activities

<table>
<thead>
<tr>
<th>Name</th>
<th>International Journal Publications (with Impact Factor)</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Safdar Ali, Professor</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Dr. M. Saleem Akhtar</td>
<td>22</td>
<td>1</td>
</tr>
<tr>
<td>Dr. M. Azhar Naeem, Associate Professor</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dr. Ghulam Jilani, Associate Professor</td>
<td>34</td>
<td>1</td>
</tr>
<tr>
<td>Dr. Khalid Saifullah, Associate Professor</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>Dr. Muhammad Akmal, Assistant Professor</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Dr. M. Tariq Siddique, Assistant Professor</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Dr S Sohail Iqbal, Assistant Professor</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Dr. Qaiser Hussain, Assistant Professor</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Mr. Arshad Nawaz, Lecturer</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Mr. Tanvir Iqbal, Lecturer</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Dr. Rifat Hayat, Lecturer</td>
<td>12</td>
<td>1</td>
</tr>
</tbody>
</table>

The Department is providing following community services:

- Organization of farmers’ day (local Pothwar area).
- Advisory services to the farmers as and when desired.
- Supervision of students on internship in various organizations in the Punjab.
Faculty Satisfaction Regarding the Administrative Services:

The department maintains a ratio of 4:1 for the academic (technical) and administrative non-technical staff which fulfils this standard set by the HEC. Administrative meetings (departmental, university, academic council, and syndicate) are attended as and when required. Generally two meetings of academic council are held in a year. Board of studies of the department meets quarterly. Proper records of individual students, their theses etc. are maintained.
Degree Title: B.Sc. (Hons) Agriculture - Soil Science

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 other universities and research organization from Pakistan. When and if needed, curriculum for the Department of Soil Science & SWC is revised/updated through different bodies. At department level, Board of Studies, which comprises of all faculty members and two members from NARC, is responsible for updating the course contents. 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 meeting. As per university rules, courses after the approval from the Faculty Board, are placed before the University Academic Council for their approval and final approval is sought from university sandicate.

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. The semester is of 18 weeks.

Degree Plan:
Presently the department offers three degree programs: B.Sc. (Hons) Agri. Major in Soil Science, M.Sc (Hons) and Ph.D in Soil Science


**Pre-Requisites:**

**Minimum Academic Requirements:**
A person holding intermediate science certificate (Pre-Medical & Pre-Engineering) or an equivalent certificate from any recognized institute with at least second division or overall 45% marks. The candidates domiciled in the Barani Areas of Punjab are eligible for admission. The admission to the university is on merit which is determined on entry test and past academic performance. Merit is determined as per the following formula:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Matric</td>
<td>10%</td>
</tr>
<tr>
<td>Intermediate</td>
<td>50%</td>
</tr>
<tr>
<td>Entry test</td>
<td>40%</td>
</tr>
</tbody>
</table>

**Degree Requirements:**
As a whole a student has to study 149 credit hours. In the first four semesters, students study minor courses (Agriculture Sciences, Information Technology and Veterinary Sciences etc.). After the completion of four semesters, students choose a specialized field (major) of study. In the other four semesters courses of major specialized subject are taught including some other courses of other departments (Detail is given in Table-6). The final semester includes internship of 15 credit hours. Students are placed in research institutes to learn research techniques practically.

Degrees are awarded after completing the required number of credit hours (courses) followed by internship report and its presentation. Minimum Cumulative Grade Point Average (GCPA) for obtaining the degree in 2.50. To remain on the roll of the university a student shall be required to maintain the following minimum GPA/CGPA in each semester (Table 6).
Table 6: Minimum CGPA in each semester required to remain on roll

<table>
<thead>
<tr>
<th>Semester</th>
<th>CGPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>0.75</td>
</tr>
<tr>
<td>Second</td>
<td>1.00</td>
</tr>
<tr>
<td>Third</td>
<td>1.25</td>
</tr>
<tr>
<td>Fourth</td>
<td>1.50</td>
</tr>
<tr>
<td>Fifth</td>
<td>1.75</td>
</tr>
<tr>
<td>Sixth</td>
<td>2.00</td>
</tr>
<tr>
<td>Seven</td>
<td>2.25</td>
</tr>
<tr>
<td>Eight</td>
<td>2.50</td>
</tr>
</tbody>
</table>

Examination and Weightage:

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

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

Practical: For practical examination (if applicable) 100% weightage is given to practical final examination

Eligibility for Examination:
A student is eligible to sit for the examination provided that he/she has attended not less than 75% of the classes in theory and practical, separately. The minimum pass marks for each course are 40% for undergraduate.
Table 7: Scheme of studies for B.Sc. (Hons) Agriculture

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGR-301</td>
<td>Basic Agriculture</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>AEC-301</td>
<td>Principles of Agricultural Economics</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>ENG-301</td>
<td>Functional English</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>HORT-301</td>
<td>Introduction to Horticulture</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>IS-301/ET-301</td>
<td>Islamic Studies/ Ethics</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>MATH-301/BIOL-301</td>
<td>Mathematics-I/ Biology-I</td>
<td>3(3-0)/3(2-2)</td>
</tr>
<tr>
<td>SS-301</td>
<td>Introduction to Soil Science</td>
<td>3(3-0)</td>
</tr>
<tr>
<td><strong>Second semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGR-302</td>
<td>Summer Crops</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>ENG-302</td>
<td>Communication Skills</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>FT-302</td>
<td>Introduction to Food Sciences Technology</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>HORT-302</td>
<td>Principles of Horticultural Practices</td>
<td>2(1-2)</td>
</tr>
<tr>
<td>MATH-302/BIOL-302</td>
<td>Mathematics-II/ Biology-II</td>
<td>3(3-0)/3(2-2)</td>
</tr>
<tr>
<td>RF-302</td>
<td>Introduction to Rangeland &amp; Wildlife Management</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>SS-302</td>
<td>Soil and Water Conservation</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>SSH-302</td>
<td>Pakistan Studies</td>
<td>2(2-0)</td>
</tr>
<tr>
<td><strong>Third semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGR-401</td>
<td>Winter Crops</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>AS-401</td>
<td>Animal Husbandry</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>ENT-401</td>
<td>Introductory Entomology</td>
<td>2(1-2)</td>
</tr>
<tr>
<td>FT-401</td>
<td>Food Processing and Preservation</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>IT-401</td>
<td>Introduction to Information Technology</td>
<td>3(1-4)</td>
</tr>
<tr>
<td>PBG-401</td>
<td>Introductory Genetics</td>
<td>2(1-2)</td>
</tr>
<tr>
<td>PP-401</td>
<td>Introduction to Plant Pathogens</td>
<td>2(1-2)</td>
</tr>
<tr>
<td>RF-401</td>
<td>Introduction to Agro forestry and Watersheds</td>
<td>2(1-2)</td>
</tr>
<tr>
<td><strong>Fourth semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGR-402</td>
<td>Field Crop Physiology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>ENT-402</td>
<td>Applied Entomology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>AEE-402</td>
<td>Introduction to Agricultural Extension Education</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>AS-402</td>
<td>Poultry Husbandry</td>
<td>2(1-2)</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>PBG-402</td>
<td>Introductory Plant Breeding</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>PP-402</td>
<td>Introduction to Soil Science &amp; SWC</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>STAT-402</td>
<td>Introduction to Statistics</td>
<td>3(3-0)</td>
</tr>
<tr>
<td><strong>Fifth semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS-501</td>
<td>Physical Properties of Soils</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>SS-503</td>
<td>Chemical Properties of Soils</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>SS-505</td>
<td>Instrumentation and Laboratory Techniques</td>
<td>3(0-6)</td>
</tr>
<tr>
<td>SS-507</td>
<td>Soil Genesis and Morphology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>SS-509</td>
<td>Introduction to Soil Classification</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>AEN-501</td>
<td>Farm Mechanization</td>
<td>2(1-2)</td>
</tr>
<tr>
<td>AGRO-501</td>
<td>Arid Zone Agriculture</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>SOC-501</td>
<td>Rural Postral Sociology</td>
<td>2(2-0)</td>
</tr>
<tr>
<td><strong>Sixth semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS-502</td>
<td>Salt-affected Soils &amp; Their Management</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>SS-504</td>
<td>Soil Survey &amp; Land Evaluation</td>
<td>4(3-2)</td>
</tr>
<tr>
<td>SS-506</td>
<td>Soil and Water Conservation</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>SS-508</td>
<td>Instrumentation and Laboratory Techniques</td>
<td>2(0-4)</td>
</tr>
<tr>
<td>SS-510</td>
<td>Wind Erosion and its Control</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>SS-512</td>
<td>Introduction to Soil Microbiology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>AEN-502</td>
<td>Conservation Engineering &amp; Water Resources Develop.</td>
<td>2(1-2)</td>
</tr>
<tr>
<td><strong>Seventh semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS-502</td>
<td>Salt-affected Soils &amp; Their Management</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>SS-504</td>
<td>Soil Survey &amp; Land Evaluation</td>
<td>4(3-2)</td>
</tr>
<tr>
<td>SS-506</td>
<td>Soil and Water Conservation</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>SS-508</td>
<td>Instrumentation and Laboratory Techniques</td>
<td>2(0-4)</td>
</tr>
<tr>
<td>SS-510</td>
<td>Wind Erosion and its Control</td>
<td>2(2-0)</td>
</tr>
<tr>
<td>SS-512</td>
<td>Introduction to Soil Microbiology</td>
<td>3(2-2)</td>
</tr>
<tr>
<td>AEN-502</td>
<td>Conservation Engineering &amp; Water Resources Develop.</td>
<td>2(1-2)</td>
</tr>
<tr>
<td><strong>Eighth semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS-602</td>
<td>Internship Including Report writing and Presentation</td>
<td>15(0-30)</td>
</tr>
</tbody>
</table>

Detailed course contents of undergraduate schemes of studies are given in annexure-I
Standard 2.1: Assessment of the Soil Science & SWC Curriculum

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

Table 8: Courses vs program outcome

<table>
<thead>
<tr>
<th>Group</th>
<th>HRD</th>
<th>Priority of Research</th>
<th>Integrated Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Fertility and Microbiology</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>Soil Chemistry and Mineralogy</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>Soil Physics, Soil and Water</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>Conservation</td>
<td>++</td>
<td>+++</td>
<td>+++</td>
</tr>
</tbody>
</table>

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

The curriculum fits very well and satisfies the core requirements for the program, as specified by 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 Pakistan Higher Education Commission.
Standard 2.2: Theoretical backgrounds, problem analysis, solution design must be stressed within the program’s core material

Table 9: Theoretical background, problem analysis, solution design within program

<table>
<thead>
<tr>
<th>Elements</th>
<th>Course No.</th>
</tr>
</thead>
</table>

The courses taught to address the core issue of the program to understand background of the area, its inherent problems and solutions to overcome through well thought curriculum, teaching field visits and practical classes.

Standard 2.3: The curriculum must satisfy major requirement of the program

The major requirements of the program are achieved through lecture, practical classes, field demonstrations, visits to research institutes and participation in the seminars, workshops and congresses.

Standard 2.4: The curriculum must satisfy general education of arts, professional and other discipline requirement of the program

These requirements of the program are achieved by regulatory body named directorate of student’s affairs. This body organises different program related to arts and other activities.
Standard 2.5: 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 “STAT-402 Introduction to Statistics 3 Cr. hrs. and STAT-601 Experimental Design 2 Cr. hrs (total 5 credit hours) based on computer practical usage are included in the curriculum to fulfill the I.T. requirements for the students of B.Sc (Hons) Agric. degree.

Standard 2.6: Enhancing Oral and Written Communication Skills of the students

A number of courses including “ENG-302 Communication Skills 3 Cr. hrs.” “SS-602 Internship Including Report writing and Presentation 20 Cr. hrs.” “SS-609 Project Planning & Scientific Writing 2 Cr. hrs.” each are compulsory at the graduate level. Assignments are given to BSc (Hons) Agri. students on specific titles (part of the course) which are presented orally and are submitted as written report, to increase their oral and written communication skills.
Criterian 3:
LABORATORIES AND COMPUTER FACILITIES

There are 3 laboratories in the department. The facilities and shortcomings of these laboratories are listed as under:

Facilities:
Among three research laboratories, one is for practical demonstration to undergraduate students, other two are for postgraduate student activities. One additional small laboratory is for micronutrient and heavy metal analytical work.

Shortcomings:
The undergraduate laboratory is also used as class room/examination hall as and when required, which disturbs the usual laboratory activities. Further, the department is in immediate need of computer lab. So that the students can carry out data analysis, reports write up, review of literature and preparation of publications. One additional laboratory for undergraduate practical is very much needed. The safety measures in the laboratories need a comprehensive revision plan to address the issues in case of emergency.

Standard 3.1: Laboratory Manuals
The manuals used in the laboratories of the department are internationally accepted manuals, e.g. ICARDA Manual. A specific manual for nitrogen fixation assessment and other soil and plant analysis namely, “Manual Method for Nitrogen Fixation Assessment” has been prepared by the professors of the department.

Standard 3.2: Support/Laboratory Personal for Maintenance of Laboratory
There are only three Lab. Attendants for all the five labs. However, the Lab. Attendants have not relevant knowledge. The laboratories have highly sophisticated equipment therefore this is imperative to have Lab. Technician in the department.
Institutional Facilities:
The departmental library has 360 books relevant to the programs. However, there is no specific room and sitting arrangement for use of these books.

Institutional Support:
Space limitation is the major constraint in the development and strengthening of discipline. Due to unavailability of class rooms, classes are also taken in the laboratories.

Standard 3.3: Computing Infrastructure and Facilities

Computing facilities support: Students of B.Sc. program have access to computer facilities at central library level.

Computing infrastructure: Computers with internet facilities are available to all faculty members and postgraduate students.

Safety Arrangements: Safety arrangements and security plan at department leve need to update to address the issues in case of emergency. Revision plan for fire extinguishers for laboratories is also required.
Criterian 4:
STUDENT SUPPORT AND GUIDANCE

University organizes support programs for students and provide information regarding admission, scholarship schemes etc. Department in its own capacity arranges orientation and guided tours of the department. Director Students Affairs is also there and arranges various cultural activities and solves the students’ problems.

Standard 4.1: Frequency of Courses
- Courses are taught as per criteria of HEC.
- At undergraduate level subjects/ courses are offered as per scheme of study provided by the HEC and approved by Academic Council. Postgraduate level courses are however offered according to the availability of the teacher and number of students.
- Elective courses are offered as per policy of HEC and the University.

Standard 4.2: Structure of the Courses
To ensure effective interaction between students, faculty and teaching assistants, at the time of course formulation both theoretical and field/practical aspects are focused. Theoretical problems are explained and assignments are also given to the students whereas practical are carried out in the labs and field.

Field visits and study tours to various research organizations are also organized to keep them updated on the latest developments in the area and to stimulate them for discussion through teacher-student interaction.

Courses are structured and decided in the Board of Studies meeting. At the commencement of the semester, faculty members interact frequently among themselves and with students. Students are welcome to ask question in class and even after the class. Emphasis is always given for an effective interaction between each section of B.Sc. (Hons) classes.
Standard 4.3: Guidance to the students

- For student counseling, regular monthly meetings are organized by the head of the department.
- Access to visit the teachers throughout the working hours is allowed and encouraged.
- Participation of the research students in the monthly meetings is mandatory.
- Information desk of the department helps the students in communication and process of relevant documents for their admission, enrollment of semesters and other prerequisites for submission of documents to the Director Advanced Studies.
- Tutorial system is established to guide the undergraduate students. Three resource faculty members have been engaged as tutor.
- Director Students Affairs also play a major role in personality growing and solving problems of the students.
- Directrate of Students Resource Center also contributing to guide the graduate and post graduate student to explore the financial opportunities and jobs.
- Continual efforts and steps are being taken by the management of the department to guide the student’s belong to undergraduate and post graduate programme.
- Directrate of sports helps a lot in grooming the students through healthy activities.
Criterian 5:
PROCESS CONTROL

It includes admission of students in different programmes, registration procedures, recruitment of faculty members, teaching and delivery of course material, and completion and evaluation of programmes.

Standard 5.1: Program Admission Criteria
Admission criteria set by Higher Education Commission is followed for all admission programs including B.Sc. (Hons) studies.

Standard 5.2: Process of Registration
The registration process is formalized by registrar office and registration number is issued to the students.

Standard 5.3: Recruitment of Faculty
For Recruitment of faculty members, guidelines are set and issued by HEC are followed.

Standard 5.4: Teaching and Delivery of Course Material
- Curriculum for undergraduate and post graduate studies is revised when required under the guidelines of HEC.
- Teachers use all audio visual tools during lectures to enhance the processes of learning.
- Photocopies of required specific material for reading purpose are handed over to the students during lectures.
- In reference to relevant subject, list of books is also provided to the students.

Standard 5.5: Completion of Program Requirements
The controller of examinations announces calendar schedule for mid and final examination. Examination evaluation program include assignments, quiz, tour activities, mid and final exams according to the requirement of each program. Students Evaluation Program is asunder:
In theory, weightage to each component of examination is as prescribed here under:

Midterm Examination 30%
Assignments 10%
Final Examination 60%

Table 10: Grade points

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

Gold medals are awarded to the students who secure highest marks. Degrees are awarded to the students on the annual convocation that is held late every year.
Criterain 6:
FACULTY

Standard 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.

Full Time Faculty

Professors 2
Associate Professors 3
Assistant Professors 5
Lecturers 2
Total: 12

Table 11: Full time faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Qualification</th>
<th>Specialization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Safdar Ali</td>
<td>Professor</td>
<td>Ph. D.</td>
<td>Soil &amp; Water Conservation</td>
</tr>
<tr>
<td>Dr. M. Saleem Akhtar</td>
<td>Professor</td>
<td>Ph. D.</td>
<td>Soil Mineralogy &amp; Soil Physics</td>
</tr>
<tr>
<td>Dr. M. Azhar Naeem</td>
<td>Associate Professor</td>
<td>Ph. D.</td>
<td>Soil &amp; Water Conservation</td>
</tr>
<tr>
<td>Dr. Ghulam Jillani</td>
<td>Associate Professor</td>
<td>Ph. D.</td>
<td>Soil Microbiology</td>
</tr>
<tr>
<td>Dr. Khalid Saifullah</td>
<td>Associate Professor</td>
<td>Ph. D.</td>
<td>Soil Environment</td>
</tr>
<tr>
<td>Dr. Muhammad Akmal</td>
<td>Assistant Professor</td>
<td>Ph. D.</td>
<td>Soil Environment</td>
</tr>
<tr>
<td>Dr. M. Tariq Siddique</td>
<td>Assistant Professor</td>
<td>Ph. D.</td>
<td>Soil Fertility &amp; Plant Nutrition</td>
</tr>
<tr>
<td>Dr. S. Sohail Ijaz</td>
<td>Assistant Professor</td>
<td>Ph. D.</td>
<td>Soil and Water Conservation</td>
</tr>
<tr>
<td>Dr. Rifat Hayat</td>
<td>Assistant Professor</td>
<td>Ph. D.</td>
<td>Soil Biology/BNF</td>
</tr>
<tr>
<td>Dr. Qaiser Hussain</td>
<td>Assistant Professor</td>
<td>Ph. D.</td>
<td>Soil Microbiology</td>
</tr>
<tr>
<td>Arshad Nawaz Ch</td>
<td>Lecturer</td>
<td>M. Sc.</td>
<td>Soil fertility and Organic</td>
</tr>
<tr>
<td>Tanveer Iqbal</td>
<td>Lecturer</td>
<td>M. Sc.</td>
<td>Soil fertility and Organic</td>
</tr>
</tbody>
</table>
Table 12: Faculty Distribution by Program Areas in Soil Science & SWC

<table>
<thead>
<tr>
<th>Program area of specialization</th>
<th>Courses in the area and average number of sections 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>Soil Fertility</td>
<td>9</td>
<td>04</td>
<td>02</td>
</tr>
<tr>
<td>Soil Chemistry</td>
<td>7</td>
<td>03</td>
<td>02</td>
</tr>
<tr>
<td>Soil Biology/Biochemistry</td>
<td>8</td>
<td>02</td>
<td>02</td>
</tr>
<tr>
<td>Soil &amp; Water Conservation</td>
<td>9</td>
<td>02</td>
<td>02</td>
</tr>
<tr>
<td>Soil Physics/Mineralogy</td>
<td>5</td>
<td>01</td>
<td>02</td>
</tr>
<tr>
<td>Total:</td>
<td>38</td>
<td>12</td>
<td>10</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.

- Professional training and availability of adequate research and academic facilities are provided to the faculty members according to the available resources.
- Incentives in the form of allowances to theses supervisors have been implemented lately to promote high standard research.
- Existing facilities include mainly internet access, which is available through networking system in addition to library facilities.
- Faculty evaluation program is run twice a year, during each semester and students do help to evaluate them.
## Faculty Resume (Proforma 9)

<table>
<thead>
<tr>
<th>Name: Dr. Mohammad Saleem Akhtar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal</strong></td>
</tr>
<tr>
<td>Department of Soil Science &amp; SWC</td>
</tr>
<tr>
<td>University of Arid Agriculture</td>
</tr>
<tr>
<td>Murree Road Rawalpindi</td>
</tr>
<tr>
<td>03335128370</td>
</tr>
<tr>
<td><strong>Experience</strong></td>
</tr>
<tr>
<td>May 23, 2007 to present: Professor of Soil Science (BS-21), Arid Agriculture University Rawalpindi</td>
</tr>
<tr>
<td>June 2003 to October 2005: Humboldt Research Fellow University of Karlsruhe, Karlsruhe, Germany. Modeling heavy metal ions transport through soil to improve predictions on soil and groundwater quality.</td>
</tr>
<tr>
<td>November 1999 to November 2000, Visiting Scientist Cornell University, New York, USA. Modeling of phosphorus transport through soils</td>
</tr>
<tr>
<td>May 1993 to May 1998, Senior Scientific Officer, PARC, Soil management, reclamation of degraded soils. Soil potassium availability to plants with respect to mineralogy</td>
</tr>
<tr>
<td>October 1989 to May 1993, Scientific Officer, PARC, Soil management, industrial by-product use for reclamation of degraded soils. Potassium availability</td>
</tr>
<tr>
<td>August 1985 to September 1989, Graduate Student, Texas A&amp;M University College Station Texas USA. Soil mineralogy and K quantity/intensity relation in Pakistan soils”</td>
</tr>
<tr>
<td>February 1982 to August 1985 Soil Scientist, PARC, Islamabad. Increase in crop production through soil and fertilizer management, reclamation of degraded lands.</td>
</tr>
<tr>
<td><strong>Honor and Awards</strong></td>
</tr>
<tr>
<td>Alexander von Humboldt fellowship 2003-2005, Institute of Mineralogy and Geochemistry University of Karlsruhe, Germany</td>
</tr>
<tr>
<td>Certificate of Participation in 16 weeks Goethe Institute, Schwäbisch Halle, Germany,</td>
</tr>
<tr>
<td>Certificate of Accomplishment by PARC and BSTID-U.S. A.I. D</td>
</tr>
<tr>
<td><strong>Memberships</strong></td>
</tr>
<tr>
<td>Soil Science Society of Pakistan – life member</td>
</tr>
<tr>
<td>Pakistan Botanical Society</td>
</tr>
<tr>
<td>Member of Regional Fellows of Alexander von Humboldt Scholarship</td>
</tr>
<tr>
<td>Graduate Students</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Postdocs</td>
</tr>
<tr>
<td>Honour Students</td>
</tr>
<tr>
<td>Students</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
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<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Service Activity</th>
<th>Peer review services for several intl. journals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Project evaluation for many funding agencies</td>
</tr>
<tr>
<td></td>
<td>Theses and job application review of other institutions</td>
</tr>
<tr>
<td></td>
<td>Resource person for training and workshops</td>
</tr>
<tr>
<td></td>
<td>Soil/ plant analytical facilities for students of sister departments.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brief Statement of Research Interest</th>
<th>Soil management for efficient water use in arid areas, Plant nutrient (P,K) fixation and release processes in soil, Modelling solute transport in soils and assessment of soil contamination</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Publications</th>
<th>International and National Journal with Impact Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authors</td>
<td>Year</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>A. Mehmood M. S. Akhtar, R. Hayat, M. Memon</td>
<td>2010</td>
</tr>
<tr>
<td>M.M. Hassan, M. Rashid, M. Saleem Akhtar, E. Rafiq</td>
<td>2010</td>
</tr>
<tr>
<td>M. Saleem Akhtar and Joe B. Dixon</td>
<td>2009</td>
</tr>
<tr>
<td>M. Saleem Akhtar, G. Nabi, M. M. Hassan</td>
<td>2008</td>
</tr>
<tr>
<td>M. S. Akhtar, T. Steenhuis, B. Richards, M. McBride</td>
<td>2004</td>
</tr>
<tr>
<td>G. Nabi, C. E. Mullins, M.B. Montemayer M. Saleem Akhtar</td>
<td>2001</td>
</tr>
</tbody>
</table>

(B) International and National Journals (without impact factor)
density as affected by tillage and fertilizer in rain-fed wheat production system. Pakistan Journal of Biological Sciences 3:1223-1226.


(C) International Conference Proceeding Papers (reviewed)


(D) National Conference Proceeding Papers


(E) Book / Book Chapter


(F) Popular Articles (selected)
<table>
<thead>
<tr>
<th>Research Grants and Contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 2008 to December 2011, Higher Education Commission research project “Characterization and Quantification of Soil Iron Oxides and their Effect on Phosphorus Sorption” Project Incharge</td>
</tr>
<tr>
<td>May 1991 to September 1993, USAID-BOSTID competitive grant “Potassium ammonium dynamics in relation to soil mineralogy and implications for fertility management”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Res. creative accomplishments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Selected Professional Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td>(F) Oral/Poster Presentations in International Conferences</td>
</tr>
<tr>
<td>Estimation of Preferential Flow Based on Structure Analysis Using X-ray Tomographie of Large Soil Columns. Eos Trans. AGU, 87(52), Fall Meet. Supplementary Abstract</td>
</tr>
<tr>
<td>Adsorption Coefficient from the Batch Experiment: Does it Reflect Retardation in Field Soil? Annual meeting of Mineralogical Society Germany (DMG), Karlsruhe 2004.</td>
</tr>
</tbody>
</table>
| Potassium availability as affected by soil mineralogy. Regional symposium on K-availability of soils in West Asia and North Africa: status and

<table>
<thead>
<tr>
<th>Name</th>
<th>Dr. Khalid Saifullah Khan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal</strong></td>
<td>Department of Soil Science &amp; SWC, PMAS-Arid Agriculture University, Shamsabad, Rawalpindi Cell No. 0300-9543958  email: <a href="mailto:khan_ks@yahoo.com">khan_ks@yahoo.com</a></td>
</tr>
<tr>
<td><strong>Memberships</strong></td>
<td>Life-Member of the Soil Science Society of Pakistan since 1989. Member of Alumi-Portal, Germany since 2003 Member of Humboldt Alumni Association since 2009.</td>
</tr>
<tr>
<td><strong>Graduate Students</strong></td>
<td>Number of Students Supervised as Major Supervisor:</td>
</tr>
</tbody>
</table>
Postdocs
Undergraduate
Students
Honour Students
M.Sc (Hons)Agri-Soil Science: 8
Ph.D Soil Science: 4
Member of Supervisory Committee:
M.Sc (Hons)Agriculture: 20
Ph.D: 7

Service Activity
Incharge, Central Research Laboratory of the University from Oct. 1999 till present.
Consultant, water quality and plant nutrition, Farmer Market (Pvt) Ltd. from June 2011 till present
Member of the Faculty Board of Studies and University Academic Council
Member, Departmental Board of Studies
Water quality analysis for Koont Farm
Lectures to Progressive Farmers at Lahore, Multan and Hyderabad on Zn nutrition of plants in collaboration with ICI Pakistan Ltd.

Brief Statement of
Research Interest
Role of soil microbial biomass as a source/sink of plant nutrients.
Studies on soil microbial processes leading to nutrient availability in soil-plant system.
Improving phosphorus availability to crop plants through stimulation of soil microbial biomass and microbial metabolites
Assessment of soil microbial biomass and soil enzymes as an index of soil quality

Publications


<table>
<thead>
<tr>
<th>Other Research or Creative Accomplishments</th>
<th>Nil</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Selected Professional Presentations</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Name:** Dr Muhammad Tariq Siddique

**Personal**

Department of Soil Science & SWC  
University of Arid Agriculture  
Murree Road Rawalpindi  
03335128370

**Experience**

November 2010 to present: Associate Professor of Soil Science (BS-19), Arid Agriculture University Rawalpindi  
May 07, 2007 to November 2010: Assistant Professor of Soil Science (BS-19), Arid Agriculture University Rawalpindi  
August 2004 to May 2007: Assistant Agricultural Chemist, Soil & Water Testing Laboratories, Rawalpindi  
April 1984 to July 2004 : Assistant Research Officer  
January 2001 to February 2003: Visiting Scientist at University of Reading, UK.  
November 1995 to 2000: PhD Scholar at University of Reading, UK.  
March to June, 1989: Research Trainee at International Rice Research Institute, Philippines. Certificate of completion “The four month INSURF training course”.

**Honor and Awards**

World Band Award for PhD studies in the University of Reading, UK. under ARP-II from November 1995 to 2000.
| Memberships | Soil Science Society of Pakistan – life member  
|            | Pakistan Botanical Society  
|            | Executive member as General Secretary of Soil Science Society of Pakistan for the year 2013 & 14. |
| Graduate Students Postdocs Undergraduate Students Honour Students | Ten |
| Service Activity | Worked as Quality & Technical manager for accreditation ISO-17025 for soil water testing laboratories under Punjab Govt.  
|                  | Peer review services for journals  
|                  | Project evaluation for funding agencies  
|                  | Theses review of other institutions  
|                  | Resource person for training and workshops  
|                  | Soil/ plant analytical facilities for students of sister departments. |
| Brief Statement of Research Interest | Soil management for restoration of fertility and plant nutrition. Nutrient management for fruit crops. |
of Animal and Plant Sciences 3, 26-29.


C:


Siddique, M.T., M. Rahid. And Ehsan, B.A. 1988. Efficiency of applied gypsum


Research Grants and Contracts. Soil and plant nutrient indexation of apple orchards of Murree region, grant Sponsored by the PMAS-Arid Agriculture University, Rawalpindi
Soil characterization for plant available nutrients in arid region, grant sponsored by Punjab Govt.
Micronutrient status of citrus orchards in Punjab, sponsored by Pakistan Agriculture Research Council, Islamabad.

Other Res. creative accomplishments Not available

Selected Professional Presentations

<table>
<thead>
<tr>
<th>Name</th>
<th>Dr. Shahzada Sohail Ijaz</th>
</tr>
</thead>
</table>
| Personal      | Father’s Name: Ijaz Hussain  
Date of Birth: 01, August 1976 |
| Experience    | Assistant Professor  
Sept 15, 2008 to date  
Department of Soil Science & Soil and water conservation, PMAS-Arid Agriculture University Rawalpindi, Pakistan  
Research Associate  
Feb 19, 2007 to July 15, 2008  
ALP Project “Impact of tillage systems, legume and mulch on soil profile moisture dynamics and wheat production” Department of Soil Science, University of Arid Agriculture, Rawalpindi, Pakistan  
Research Fellow  
Feb 01, 2003 to Aug 31, 2003  
PSF Project entitled “Potential of mungbean and mashbean to fix nitrogen and benefit the subsequent wheat crop in Pothwar”  
Research Fellow  
Feb 01, 2001 to Dec 31, 2002  
ACIAR Project 9762 entitled “Sustainable Legume Cereal Production Systems through Management of N2- Fixation” University of Arid |
<table>
<thead>
<tr>
<th>Honor and Awards</th>
<th>1. Postdoctoral Research Fellowship</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. HEC Merit Scholarship for Ph. D (Merit Scholarship for Ph.D Studies in Science &amp; Technology, 200 Scholarships Scheme)</td>
</tr>
<tr>
<td></td>
<td>3. Merit Scholarship (thrice) during B.Sc. (Hons) and M.Sc. (Hons) University of Arid Agriculture, Rawalpindi, Pakistan</td>
</tr>
<tr>
<td>Memberships</td>
<td>1. Soil Science Society of America (10 years)</td>
</tr>
<tr>
<td></td>
<td>2. Soil Science Society of Pakistan (Life member)</td>
</tr>
<tr>
<td></td>
<td>3. Pakistan Society of Agronomy (Life member)</td>
</tr>
<tr>
<td></td>
<td>4. Agronomy society of America (2 years)</td>
</tr>
<tr>
<td></td>
<td>5. Crop science society of America (2 years)</td>
</tr>
<tr>
<td>Graduate Students</td>
<td>PhD Soil Science</td>
</tr>
<tr>
<td>Honour Students</td>
<td>MSc. (Hons) Soil Science</td>
</tr>
<tr>
<td>Service Activity</td>
<td>1. Served as Incharge Research Fields, Department of Soil Science &amp; SWC</td>
</tr>
<tr>
<td></td>
<td>2. Served as Member Faculty Board of FC&amp;FC</td>
</tr>
<tr>
<td></td>
<td>3. Served as Tutor &quot;tutorial group P&quot;</td>
</tr>
<tr>
<td>Brief Statement of Research Interest</td>
<td>My main research interest is soil and water conservation in dryland areas. More specific research activities within this domain include use of conservation tillage for erosion control, \textit{in situ} moisture conservation and carbon sequestration. Another tool we are currently using is soil carbon modelling for estimation of longterm management effects on soil, crop</td>
</tr>
</tbody>
</table>
production and environment.

<table>
<thead>
<tr>
<th>Publications</th>
</tr>
</thead>
</table>

| Research Grants and Contracts. |
| Completed Project entitled "Potential of conservation tillage to reduce soil CO2 emission from Pakistani Inceptisol of sub humid subtropics" Funded by PMAS-AAUR 12/24/2009 to 12/24/2010 Amount 0.1 million |

| Other Research or Creative Accomplishments |
| N/A |

| Selected Professional Presentations |
| Name |
| Dr Arshad Nawaz Chaudhry |
| Personal |
| Assistant Professor, Department of Soil Science & Soil and Water Conservation, Pir Mehar Ali Shah Arid Agriculture University, Rawalpindi, Pakistan. |
| Experience |
| May 31,2012 to date Assistant Professor |

95
June, 1997 to 2012 Lecturer
Served as Fellow Scientist at University of Arid Agriculture in Australian Center for International Agriculture Research (ACIAR) Project.
October, 1993 – December, 1994
Worked as Fellow Scientist in Management of Heat, Moisture and other Physical Stress Factors (MAHMOS) under South Asian Vegetable Research Network Project at National Agriculture Research Centre, Islamabad

<table>
<thead>
<tr>
<th>Honor and Awards</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Certificate of Professional Development awarded by Higher Education Commission</td>
</tr>
<tr>
<td>• under Professional Competency Enhancement Program for Teachers (PCEPT) during 2009.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Memberships</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Member, Soil Science Society of Pakistan.</td>
</tr>
<tr>
<td>• Member, Academic Council of PMAS-AAUR.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graduate Students</th>
<th>Postdocs</th>
<th>Undergraduate Students</th>
<th>Honour Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison of Different Composts for Nutrient Composition to Maize Crop under Rainfed Condition. Mr. Asim Pervaiz 2006</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison of Different Poultry Litter Composts and Chemical Fertilizers on Nutrient Composition of Maize Crop. Ms. Farzana Yasmeen, 2006</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsive Efficiency of Plant Growth Promoting and Bioprotective Rhizobacteria to Wheat Crop at Different Levels of Fertilization Ms. Memona Khan. 2007</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Determination Of Quality And Effectiveness Of Co-Compost From Fast Food Waste And Poultry Litter For Crop Production. Naveed Ahmad,2011</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study On The Nutrient Release Pattern During Co-Composting Of Different Sources Of Fast Food Wastes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Service Activity

Served as In charge Soil Science Laboratories in the Department of Soil Science and Soil and Water Conservation. Responsibilities include management of laboratories staff, purchase of Chemicals, Glassware and Scientific Equipments for use of soil analysis in the laboratories. Establishment of new laboratories and their maintenance for efficient working.

Brief Statement of Research Interest

Soil Science (Organic waste management).

Publications

Danish Iqbal 1, Umer Habib1, Nadeem Akhtar Abbasi 1 and Arshad Nawaz Chaudhry2 2012, Improvement in postharvest attributes of zinnia (Zinnia elegans cv. Benary’s giant) cut-flowers by the application of various growth regulators, Pak. J. Bot., 44(3): 1091-1094, 2012. (Impact factor 0.95).
Muhammad Imran¹, Muhammad Javaid Asad¹, Muhammad Gulfraz¹, Rahmatullah Qureshi², Hina Gul³, Nazish Manzoor³ and Arshad Nawaz Ch.³, 2012, Hyper production of glucoamylase by aspergillus niger through solid state fermentation, Pak. J. Bot., 44(6): 2103-2110, 2012. (Impact factor 0.95).
Allelochemicals: sources, toxicity and microbial transformation in soil – a review. Annals of Microbiology. 58(3): 351-357. (Impact factor 0.427)


<table>
<thead>
<tr>
<th>Research Grants and Contracts</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Research or Creative Achievements</td>
<td>NA</td>
</tr>
</tbody>
</table>

Selected Professional Presentations


<table>
<thead>
<tr>
<th>Name</th>
<th>Dr. Muhammad Akmal</th>
</tr>
</thead>
</table>
| Personal              | Assistant Professor, Department of Soil Science, Pir Mehr Ali Shah Arid Agriculture University Rawalpindi 46300, Pakistan  
E-mail: akmal@uaar.edu.pk, Cell # 0345-5973793 |
| Experience            | Since 19 October 2006 to date, Assistant Professor (Regular), PMAS- Arid Agriculture University Rawalpindi.  
From 27 April 2006 to 18 October 2006, Assistant Professor (HEC, Interim Placement), PMAS- Arid Agriculture University Rawalpindi. |
| Honor and Award       | Chinese Cultural Exchange Scholarship Award for Ph.D. studies in 2002-2005.  
Excellent Member Award for the year 2003-2004 by the Green Zhejiang Organization, China.  
HEC Post-doc Fellowship for Colorado State University, USA, in year 2011. |
| Memberships           | Soil Science Society of America  
Soil Science Society of Pakistan  
Pakistan Botanical Society  
Asian Network of Organics Recycling |
| Graduate Students     | Year, Degree, Name  
2008, M.Sc. (Honors), Waseem Hassan,  
2009, M.Sc. (Honors), Idrees Haider,  
2009, M.Sc. (Honors), Zaman Ali,  
2010, M.Sc. (Honors), Israr Asghar,  
2010, M.Sc. (Honors), Muhammad Sohail Altaf,  
2011, M.Sc. (Honors), Muhammad Farooq Bashir, |
| Undergraduate Students| Year, Degree, Name  
2008, M.Sc. (Honors), Waseem Hassan,  
2009, M.Sc. (Honors), Idrees Haider,  
2009, M.Sc. (Honors), Zaman Ali,  
2010, M.Sc. (Honors), Israr Asghar,  
2010, M.Sc. (Honors), Muhammad Sohail Altaf,  
2011, M.Sc. (Honors), Muhammad Farooq Bashir, |
| Postdocs              | Year, Degree, Name  
2008, M.Sc. (Honors), Waseem Hassan,  
2009, M.Sc. (Honors), Idrees Haider,  
2009, M.Sc. (Honors), Zaman Ali,  
2010, M.Sc. (Honors), Israr Asghar,  
2010, M.Sc. (Honors), Muhammad Sohail Altaf,  
2011, M.Sc. (Honors), Muhammad Farooq Bashir, |
| Honour Students       | Year, Degree, Name  
2008, M.Sc. (Honors), Waseem Hassan,  
2009, M.Sc. (Honors), Idrees Haider,  
2009, M.Sc. (Honors), Zaman Ali,  
2010, M.Sc. (Honors), Israr Asghar,  
2010, M.Sc. (Honors), Muhammad Sohail Altaf,  
2011, M.Sc. (Honors), Muhammad Farooq Bashir, |
| Service Activity      | Tutor for tutorial group meetings.  
Coordinator for time table and date sheet.  
Research lab incharge. |
| Brief Statement of Research Interest | Environmental Soil Chemistry  
Soil and Water Pollution  
Soil Microbiology and Biochemistry |


Muhammad Islam, Muhammad Akmal, Muhammad Aslam Khan. 2013. Effect of phosphorus and sulphur application on soil nutrient balance under Chickpea (Cicer arietinum) monocropping. Romanian Agricultural Research, 30


Research Grants and Contracts. 2013, Impact of buctril super herbicide application on microbial and enzymatic activity in soil (3.016 millions), Pakistan Science Foundation (In Review)

Selected Professional Presentations


14th Congress of Soil Science, Lahore, Pakistan, 2012.


International Symposium on Cycling and Utilization of Organic Wastes,

2nd International Conference on Soil Pollution and Remediation (SoilRem 2004), Nanjing, China, 2004.


<table>
<thead>
<tr>
<th>Name: Dr. Qaiser Hussain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal</strong></td>
</tr>
<tr>
<td>Department of Soil Science &amp; SWC</td>
</tr>
<tr>
<td>University of Arid Agriculture</td>
</tr>
<tr>
<td>Murree Road Rawalpindi</td>
</tr>
<tr>
<td>03314872466</td>
</tr>
<tr>
<td><strong>Experience</strong></td>
</tr>
<tr>
<td>September, 2011 to present: Assistant Professor of Soil Science (BS-19), Arid Agriculture University Rawalpindi</td>
</tr>
<tr>
<td>September 2007 to July 2011, PhD Scholar, Nanjing Agricultural University, China. Rhizosphere microbial communities changes with rice cultivars and significance in greenhouse gases evolution in rice paddy</td>
</tr>
<tr>
<td>October 2003 to June, 2008: Assistant Research Officer, Soil Fertility Lab. Soil and water samples collection from farmers’ field and analyses and advisory services to farmer community for sustainable crop production.</td>
</tr>
<tr>
<td><strong>Honor and Awards</strong></td>
</tr>
<tr>
<td>University of Agriculture Faisalabad merit scholarship holder (Master degree).</td>
</tr>
<tr>
<td>HEC overseas scholarship holder for PhD study in China 2007-2011</td>
</tr>
<tr>
<td>Excellent research award 2010-2011 and cash prize by Institute of resources, ecosy and environment, Nanjing, China.</td>
</tr>
<tr>
<td>Travel grant award from china national science foundation to present paper in Europ Geosciences Union, general assembly April 2-8, 2011 Vienna (Austria)</td>
</tr>
<tr>
<td>Higher Education Commission (HEC) PhD approved supervisor 2011</td>
</tr>
<tr>
<td><strong>Memberships</strong></td>
</tr>
<tr>
<td>Soil Science Society of Pakistan</td>
</tr>
<tr>
<td>European Geosciences Union (EGU), Austria</td>
</tr>
<tr>
<td>Federation of European Microbiological Society (FEMS), England</td>
</tr>
<tr>
<td><strong>Graduate Students</strong></td>
</tr>
<tr>
<td><strong>Postdocs</strong></td>
</tr>
<tr>
<td><strong>Undergraduate Students</strong></td>
</tr>
<tr>
<td><strong>Service Activity</strong></td>
</tr>
<tr>
<td>Peer review services for several intl. journals</td>
</tr>
<tr>
<td><strong>Brief Statement of Research Interest</strong></td>
</tr>
<tr>
<td>Microbial mechanisms of GHGs (CO₂, CH₄ &amp; N₂O) emission from agro-ecosystem, plant-microbe interaction in rhizosphere, carbon sequestration in agricultural land, use of biochar as soil amendment in agricultural lands for higher production and climate change mitigation in arid region.</td>
</tr>
<tr>
<td><strong>Publications</strong></td>
</tr>
<tr>
<td>International and National Journal with Impact Factor</td>
</tr>
</tbody>
</table>

101
and function associated with rhizosphere over period of rice growth. Plant, Soil and Environment 58, (2): 55–61. [I.F: 1.08]


Conference Papers/Abstracts

agriculture, Nanjing, P136-137.

**Manuscripts Submitted**
Hussain, Q., Liu, Y., Zhang, A., Pan, G., Li, L. 2013. Dynamics of ammonia-oxidizing bacterial (AOB) and archaeal (AOA) populations in the rhizosphere of hybrid and standard rice cultivars submitted to Soil Biology and Biochemistry.
Hussain, Q., Liu, Y., Jin, Z., Zhang, A., Pan, G., Li, L. 2013. Variation of methanogens (mcrA) and methanotrophs (pmoA) in the rhizosphere of hybrid and conventional rice cultivars and linkage to CH₄ emission submitted to Environmental Microbiology

<table>
<thead>
<tr>
<th>Research Grants and Contracts</th>
<th>2012-2013, PMAS-Arid Agriculture University, Rawalpindi research project “Evaluation of biochar as useful soil amendment for improving soil quality and crop productivity” (0.155 million) Principal Invigilator.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Res. creative accomplishment s</td>
<td>Not available</td>
</tr>
</tbody>
</table>

### Selected Professional Presentations

**Oral/Poster Presentations in International Conferences**

Ammonia oxidizers (amoA) and denitrifiers (nirK) dynamics in the rhizosphere between hybrid and standard rice cultivars and linkage to N₂O emission. European Geosciences Union General Assembly. April 2-8, 2011. Vienna, Austria.
Standard 6.3: All faculty members should be motivated and have job satisfaction to excel in their profession.

The faculty members are motivated and have job satisfaction which is acquired through provision of short term/long term training abroad and by pay restructuring. The results of faculty surveys summarized and given in annexure-III illustrate the faculty input.

Table 13: Faculty survey (Proforma 5)

<table>
<thead>
<tr>
<th>Sr. #</th>
<th>Parameter</th>
<th>Dr. Safdar Ali</th>
<th>Dr. M. Saleem Akhtar</th>
<th>Dr. M. Azhar Naeem</th>
<th>Dr. Ghulam Jilani</th>
<th>Dr. Khalid Saifullah</th>
<th>Dr. Muhammad Akmal</th>
<th>Dr. M. Tariq Siddique</th>
<th>Dr. S. Sohail Ijaz</th>
<th>Mr. Arshad Nawaz</th>
<th>Mr. Tanveer Iqbal</th>
<th>Dr. Rifat Hayat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Your mix of research, teaching and community service</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>The intellectual stimulation of your work</td>
<td>B</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>Type of teaching/research you currently do</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>Your interaction with students</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>Cooperation you received from colleagues</td>
<td>A</td>
<td>C</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>6</td>
<td>The mentoring available to you</td>
<td>B</td>
<td>D</td>
<td>C</td>
<td>B</td>
<td>C</td>
<td>C</td>
<td>D</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>7</td>
<td>Administrative support from the department</td>
<td>B</td>
<td>C</td>
<td>B</td>
<td>B</td>
<td>C</td>
<td>B</td>
<td>D</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>8</td>
<td>Providing clarity about the faculty promotion process</td>
<td>B</td>
<td>E</td>
<td>A</td>
<td>B</td>
<td>E</td>
<td>C</td>
<td>C</td>
<td>B</td>
<td>B</td>
<td>C</td>
<td>B</td>
</tr>
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<td>9</td>
<td>Your prospects for advancement</td>
<td>A</td>
<td>C</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>B</td>
<td>C</td>
<td>A</td>
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<td>A</td>
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<td>Criterion</td>
<td>Description</td>
<td>Scores</td>
<td>Comments</td>
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<td>10</td>
<td>Salary and compensation packages</td>
<td>A</td>
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<td>11</td>
<td>Job security and stability at the department</td>
<td>A</td>
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<td>12</td>
<td>Amount of time you have for yourself and family</td>
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<td>13</td>
<td>The overall climate at the department</td>
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<td>14</td>
<td>Whether the department is utilizing your experience and knowledge</td>
<td>A</td>
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<td>15</td>
<td>What are the best programs/factors currently available in your department</td>
<td>Head of the Institution and Research Projects, Practical Work, Head of the institution and research projects, Department may be upgraded to institute, Teaching and support to students</td>
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<td>16</td>
<td>Suggest programs/factors that could improve your motivation and job satisfaction</td>
<td>N. A.</td>
<td>Teaching through participation, Encouragements, Awards and Remarks, Department may be upgraded to institute, Apprecaition, Upgradation of department to institute</td>
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**Legends:**

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

Criterion 7:
Criteria 7:
INSTITUTIONAL FACILITIES

Standard 7.1: Infrastructure

The faculty has access to E-library which is very helpful for the high quality education and producing research of international standard. They also have access to the internet. The department has a wide range of latest equipments to update the laboratory facilities. Renovation of laboratories has been completed for smooth running of laboratory work. Power breakdown affects the efficiency and life ofquipments and computers. Lack of technical laboratory supporting staff (Laboratory technician) also affects the efficiency of smooth running of the laboratory equipment.

Standard 7.2: Library Facilities

The University Central Library has a good collection of books for the use of students and faculty members. In additions to that, department itself owns a library which fulfils the demands of the students and the faculty members. However lack of hard copies of journals in the central library is the major concern.

Standard 7.3: Class Room and Faculty Offices

All faculty members have their own offices, however, the class rooms for the students are not enough to accommodate all the students belong to different programs of the department.
Criterion 8:
INSTITUTIONAL SUPPORT

Standard 8.1: Support and Financial Resources
The department has institutional support for financial expenses. In addition to that some faculty members have research projects funded by the university and some faculty members have mega research projects financed by HEC and PSF. Research grants for young faculty members are also provided by the university. Abroad trainings of faculty members are a permanent feature for capacity building.

Standard 8.2: High Quality Graduate Students and Research Scholars
The intake of B.Sc. (Hons) students is once in a year. A detail of the students enrolled during the past two years is given in the following Table.

Table 14: Enrollment in B. Sc. (Hons) Program through 20010-2012

<table>
<thead>
<tr>
<th>Degree</th>
<th>20010-11</th>
<th>2011-12</th>
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<tbody>
<tr>
<td>B.Sc. (Hons)</td>
<td>25</td>
<td>23</td>
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</table>
ANNEXURE
ANNEXURE I:

DETAILED COURSE CONTENTS OF SCHEME OF STUDIES SOIL SCIENCE & SWC FOR
B.SC PROGRAM

SS–301 INTRODUCTION TO SOIL SCIENCE 3(2–2)

THEORY:
Genesis, Soil Morphology, Soil Classification, Soil Conservation, Soil Fertility, Soil
Microbiology, Soil Mineralogy, Soil Physics and Soil Salinity. Major Parts of Earth, Lithosphere,
Hydrosphere, Atmosphere and Biosphere. Soil Forming Rocks and Minerals: Types and their

PRACTICAL:
Preparation of Saturated Soil Paste. Determination of Saturation Water Percentage by Oven-
drying Analysis of Irrigation Water and report Writing. Determination of Bulk Density

BOOKS RECOMMENDED:
Inc., Upper Saddle River, NJ, USA.
Dane, J. H. and Topp, G C, eds., 2002, Methods of Soil Analysis, Part 4, Physical Methods,
Soil Sci. Soc. Am. No. 5, Madison, WI, USA.
Prentice-Hall, Inc., Englewood Cliffs, NJ, USA.
Saddle River, NJ, USA.
International Centre for Agricultural Research in the Dry Areas, Aleppo, Syria.
THEORY:

BOOKS RECOMMENDED:
IBH Publishing Co., New Delhi, India

THEORY:
potential and its components. Soil Hydraulic Properties. Soil compaction: causes and remedies. Soil tillage and significance

**PRACTICAL:**

**BOOKS RECOMMENDED:**

**SS-502 SALT–AFFECTED SOILS AND THEIR MANAGEMENT 3(2-2)**

**THEORY:**

**PRACTICAL:**

**BOOKS RECOMMENDED:**


**SS-503 CHEMICAL PROPERTIES OF SOILS**

**THEORY:**


**PRACTICAL:**

Effect of Soil Water Ratios on pH. Determination of soluble and extractable cations in soil. Determination of CEC.

**BOOKS RECOMMENDED:**
SS-504   SOIL SURVEY AND LAND EVALUATION  3(2-2)

THEORY:

PRACTICAL:
Reading of topographic map and calculation of slope percentage. Stereoscope: types, parts, and use. Interpretation of aerial photographs. Demonstration of GIS, GPS, and remote sensing techniques. Field visits

BOOKS RECOMMENDED:


SOIL FERTILITY AND FERTILIZERS

THEORY:

PRACTICAL:

BOOKS RECOMMENDED:

WATER CONSERVATION AND NON-CONVENTIONAL EROSION CONTROL

THEORY:
Concept of water conservation, principles of water conservation, methods for water erosion control in arable lands, engineering and biological approaches, use of agricultural machinery in
soil water conservation, water conservation and water harvesting, non arable lands, vegetative and other control measures, control of erosion along stream banks, wildlife and water conservation. Farm water storage, ponds, mini dams, farm drainage, flood control in upstream areas. Field visits to water conservation projects.

**BOOKS RECOMMENDED:**

**SS-507 SOIL GENESIS AND MORPHOLOGY 3(2-2)**

**THEORY:**
Introduction, Weathering of rocks and minerals and types of parent materials, Soil genesis and factors affecting, Pedogenic processes additions, losses, transformations and translocations., Soil macro and micro morphology, Special soil features, Description of soil profiles, Land forms, parent materials and soil development in Pakistan.

**PRACTICAL:**
Profile description of representative soil series field trips

**BOOKS RECOMMENDED:**

**SS–508 INSTRUMENTATION AND LABORTORY TECHNIQUES 2(0-4)**

**PRACTICAL:**

BOOKS RECOMMENDED:

SS–509 INTRODUCTION TO SOIL CLASSIFICATION 3(2-2)

THEORY:
Concepts and Importance, Introduction to Soil Taxonomy, Criteria of Classification, Properties Diagnostic to Categories, Diagnostic Horizons and Other Diagnostic Properties, Soil Moisture Regimes: Classes and Importance, Soil Temperature Regimes: Classes and Importance, Categories and Nomenclature, Keys to Categories: Order, Suborder, Great Group and Subgroup, FAO and other systems of Classification, Agro Ecological zones of Pakistan

PRACTICAL:
Designation of genetic horizons found in Pakistan, Identification of Taxonomic names: Orders, Suborders, Great Groups, Families and Series

BOOKS RECOMMENDED:

SS–510 WIND EROSION AND ITS CONTROL 3(3–0)

THEORY:
General characteristics and location of wind erosion areas and extent. Damages by wind erosion. The process of wind erosion; wind erosion, soil particle movement, effects on soil, principles of wind erosion control: measures to control soil erosion by wind; basis or control methods: control on cultivated lands including cover crops, strip cropping, crop rotation, wind
breaks and shelter belts, crop residue management, tillage practices and machinery, planting equipment, emergency tillage, control on grazing lands, sand drifts, other measures of erosion control, future prospects and recommendations; legislation and action to control wind erosion. Field visits to erosion prone areas and erosion control projects.

**BOOKS RECOMMENDED:**
F.A.O. 1960. Soil Erosion by Wind, F.A.O., Rome, Italy:

**SS–512**

**INTRODUCTION TO SOIL MICROBIOLOGY**

**THEORY:**

**PRACTICAL:**
Introduction to laboratory equipments related to soil microbiology. Soil sampling storage and sterilization. Preparation of media stains and functions of constituents. Microbial population. Rossi-Cholodny Contact Slide Technique and Dilution Plate Technique. Algal culturing and their microscopy. Staining techniques

**BOOKS RECOMMENDED:**
**THEORY:**


**PRACTICAL:**

Study of ammonification, nitrification and denitrification. Study of biological nitrogen fixation using conventional and advance techniques. Estimation of dehydrogenase, protease and phosphatase in soil samples.

**BOOKS RECOMMENDED:**


**THEORY:**


**PRACTICAL:**

Sampling of industrial and municipal effluents. Determination of total suspended solids' (TSS), total dissolved solids (TDS), biological oxygen demand (BOD), and chemical oxygen demand
(COD) in city I industrial effluents. Determination of toxic metal ions in effluents, sludge and vegetation.

RECOMMENDED BOOKS:

SS-605 METHODS OF SOIL AND PLANT ANALYSIS 4(2–4)
THEORY:
Quality assurance in the laboratory. S.L Units and derived S.L Units. Soil testing - its objectives and principles. Soil sampling techniques. Collection, preparation and storage for various objectives. Methods, for correlating and calibrating soil tests. Interpretation of soil test results. Testing soils for macro and micronutrients Principles and practicles of plant analysis. Sampling and handling plant tissue samples.. Plant analysis for macro and micronutrients.

PRACTICAL:

BOOKS RECOMMENDED:
SS-607 NUCLEAR TECHNIQUES IN SOIL RESEARCH 3(2-2)

THEORY:
Atomic structure. Isotopes; stable and unstable isotopes. Radio-active decay specific activity, half life. Types of radiations, radiation detection (detectors, autoradiography) Use of radioisotopes in soil and agriculture research, limitations and considerations in the radio isotopes.

PRACTICAL:
Working protocol in the nuclear research laboratory. Use of gamma radiation and neutron prob.

BOOKS RECOMMENDED:
NIFA. 1994, The use of Nuclear and other Advanced Techniques in Food and Agricultural Research. NIFA, Tarnab, Peshawar.

SS – 609 PROJECT PLANNING AND SCIENTIFIC WRITING 2(1–2)

THEORY:
Definition of research, types of research, selection of research project, literature review as a basis of research project. Essential features in planning of research project. Layout and conduct of research experiments in the field, greenhouse and laboratory. Literature review - sources and procedure

PRACTICAL:
Each student will plan an experiment under supervision of faculty members Literature review pertinent to the project.

BOOKS RECOMMENDED:

SS-602 INTERNSHIP 15 (0-30)

120