PIR MEHR ALI SHAH

ARID AGRICULTURE UNIVERSITY

RAWALPINDI

DEPARTMENT OF HORTICULTURE

B.Sc. (Hons)

Self-Assessment Report

2012-14

Program Self-Assessment Team

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Prof. Dr. Ishfaq Ahmad Hafiz	(Member)
Dr. Touqeer Ahmad	(Member**)**

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Introduction

Department of Horticulture started working with the establishment of the Barani Agricultural College in 1979. The department began B.Sc. (Hons) agriculture and the subject gained the status of major discipline for undergraduate students in 1986. All the teachers in the department involved in the various projects (topics include pathogen-free crop, soilless cultivation, soil-based crops, bulb crops, medicinal plants, the use of edible coatings to improve the shelf life of organic farming, protected cultivation of different vegetables, and the use of biotechnology tools for crop improvement), thereby Share horticulture. The Department received a significant response from here onwards. The department has been produced by famous horticulturist contribute to the country in different capacities. The department has the responsibility to advance high standards of teaching and research in horticulture area.

In horticulture, gardening plans to develop understanding of the issues of establishing the necessary skills. Its curriculum emphasizes the important aspects of plant emergence of Pakistan's economy out of the issue. In addition, crop management was given a lot of importance in the curriculum. In addition, the new, modern technology has been introduced, were excellent research.

The department of horticulture not only generate and extend knowledge for enhancing the food quality but also improve the environmental condition of our people. Between our countries, horticultural landscape design company to develop interest in the focus of men and women students. Therefore, due to overwhelming response, the department is focused on providing all possible facilities linked polished and training with other organizations such students, the future of the practice.

SECTION 1

Components of Self-Assessment Process

This report has been prepared on the basis of criteria as guided by the Self- assessment manual.

Criterion-1: PROGRAM MISSION, OBJECTIVES AND OUTCOMES

Introduction

The Department of Horticulture provides students with the knowledge and ability to job performance in a changing world. Horticulture is a diverse profession that encompasses all aspects of crop production and crop management. The aim of the department is to increase the production yield, quality and profit through the use of crop possessions. Given more emphasis on qualitative and quantitative improvement of horticultural crops through the use of modern techniques of horticultural crop production. The introduction, evaluation, characterization and development of horticultural crops are continuous processes of teaching and research at under-graduate level.

Standard 1-1: The program must have documented measurable objectives that support faculty / college and institution mission statement.

Mission Statement of the B.Sc (Hons) Program

The mission of the B.Sc (Hons) Program is to educate and provide training for B. Sc. (Hons.) Agri. Students by increasing the scientific knowledge and skills to enable them productive. The goal of the Department of Horticulture is to give knowledge quality education and research-oriented education, the expansion of horticulture.

Programme Objectives of the Department

1. Development & Strengthening of Horticulture Department for imparting sound footing education to B.Sc. students
2. To contribute basic and applied high quality knowledge and skills in the field of horticulture applying highly advanced analytical techniques for crop management and improvement.

3. To lead students and conduct research on advanced scientific lines in the field of horticulture.
4. To counter new problems in Horticulture.

Main Elements of Strategic Plan to Achieve Mission and Objectives

1. Growth of sound training system based on occurrence and vision gathered by developing diversity in bachelor course contents.
2. By frequently revising and updating the basic core and elective courses as well as study tours.
3. By imparting the practical knowledge and laboratory skills to the undergraduate students.
4. The students were imparted basic theoretical and practical knowledge.

Expected Outcome

1. The students' vision and in depth approach will be more extensive.
2. The quality, confident and well equipped human resource development will be achieved in the field of horticulture.
3. The incorporated knowledge of allied fields will help to develop the confidence of students, consequently crop productions will increase.
4. The smooth, dynamic and problem; free progress will continue in the area of horticulture.

Table-1: Program objective assessment

Objective		How Measured	When Measured	Improvement Identified	Improvement made
1	Development & Strengthening of Horticulture Department for imparting sound footing education to B.Sc. students	On the basis of recognition of Horticultural crops in the area and determining their impact	During the conductance of examination and SAR in each semester	Facilities provided for teaching are not sufficient	Teaching method have been revised in order to make them more attractive and understandable
2	To contribute basic and applied high quality knowledge and skills.	knowledge of students was measured through conducting exams during the semester	At the time of admission or semester	Some new courses need to be included in the curriculum	Curriculum changes have been made on required basis
3	To lead students and conduct research on advanced scientific lines in the field of horticulture.	Through training courses	Regular activity	Related subject to be recommended or studied	Improved better then before and continued
4	To counter new problems in Horticulture.	Through discussion, consultation and practical implementation with the farmers	Regular activity	New courses to be included in curriculum, research on new problem	Recommendation of new curriculum is suggested

<u>Standard 1-2:</u> The program must have documented outcomes for graduating students. It must be demonstrated that the outcomes support the program objectives and that graduating students are capable of performing these outcomes.

PROGRAM OUTCOMES

The program outcomes are tabulated in the following Table 2. Each program aligned in the table with each objective

Table-2: Program Vs Outcomes

Program Objectives	Program Outcomes			
	1	**2**	**3**	**4**
1	XX	XX	XX	XX
2	XX	X	XXX	XX
3	XXX	XX	XX	XXX
4	XX	XXX	X	XX

X: - Relevant

XX: - Relevant and Satisfactory

XXX: - Very Relevant and Very Satisfactory

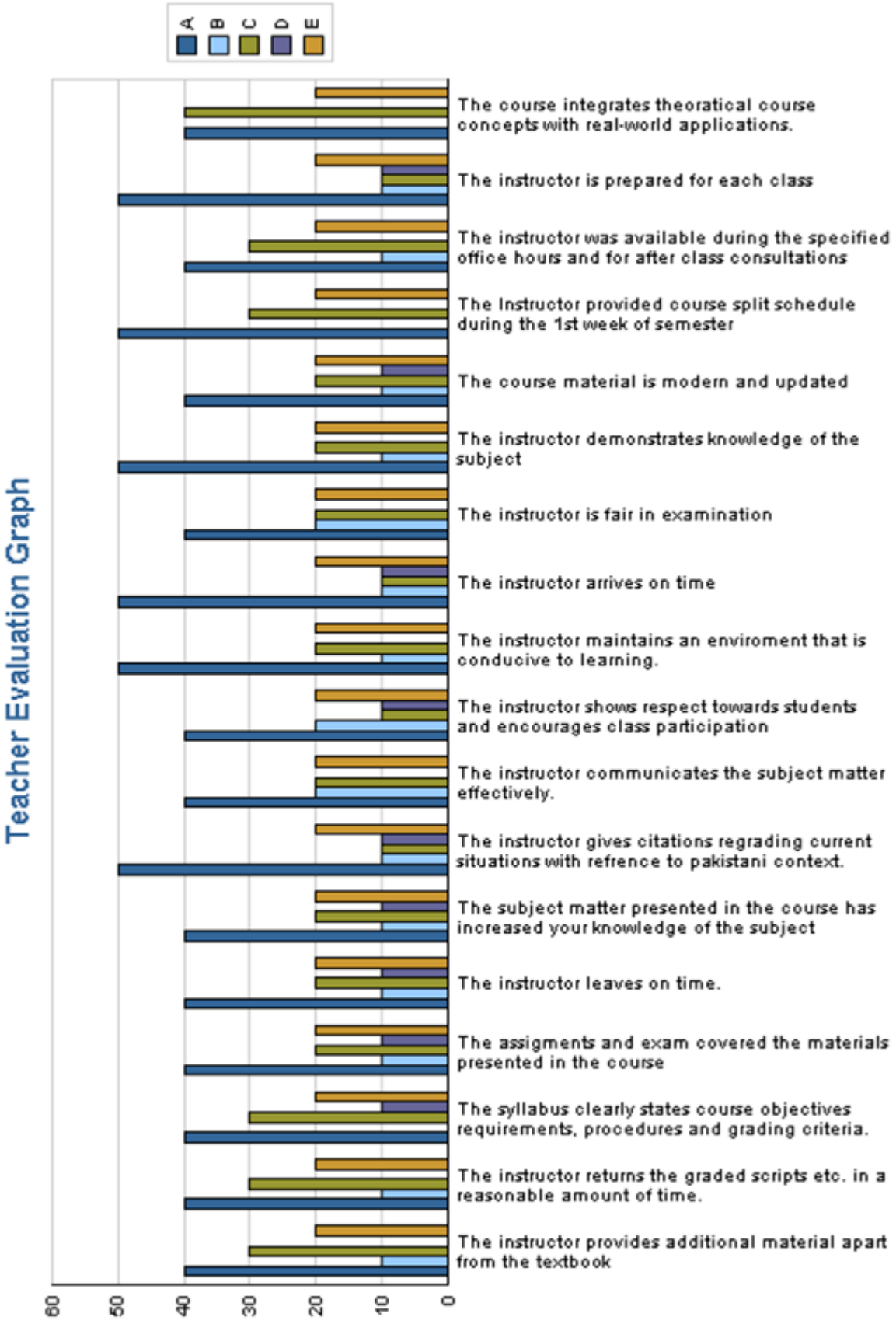
Performa 1 & 10 Course and Teacher Evaluation (2012-14)

Teacher Evaluation **Dr. Imran Hassan**

Data were collected from 16 students. The evaluation criteria parameters showed that the 64% of the students strongly agreed, 28% agreed, 7% uncertain, 0% disagreed, and 0% strongly disagreed that the instructor was prepared for each class. The data of other parameters inferred that major proportion of the students is agreed that the teacher is fair in examination; the instructor came with good preparation. ,instructor demonstrates knowledge of the subject, instructor had completed the whole course, the Instructor provided additional material apart from the textbook, the Instructor gave citations regarding current situations with reference to Pakistani context, the Instructor communicates the subject matter, the Instructor shows respect towards students and encourages class participation effectively, the Instructor maintained an environment that was conducive to learning, the Instructor arrived on time, the Instructor returned the graded scripts etc. in a reasonable amount of time, the Instructor was available during the specified office hours after class for consultations, the Subject matter presented in the course has increased their knowledge of the subject, the syllabus clearly states course objectives requirements, procedures and grading criteria, the course integrates theoretical course concepts with real-world applications, and the assignments and exams covered the materials presented in the course, the course material is modern and updated.

Comments/Suggestions:

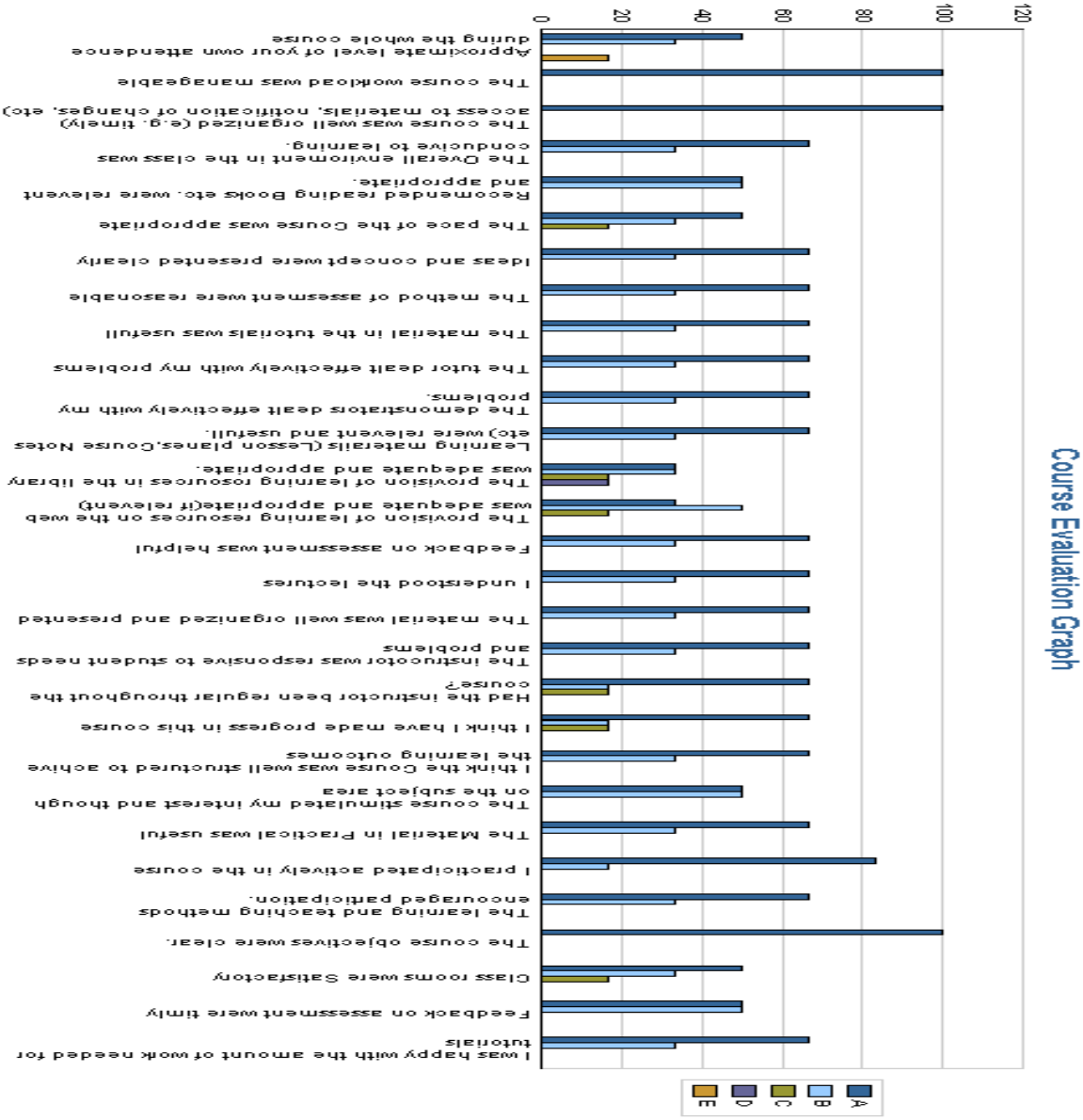
1. The teacher always relates the course topics with his practical incidents under the local environmental conditions for proper understanding of the students.
2. The teacher's attitude was affable during and after his lectures with the students.
3. The pace of course covering was commendable and understanding of the theme of the course was also appreciable.


A
B
C
D
E
Teacher Evaluation Graph
The course integrates theoratical course concepts with real-world applications.
The instructor is prepared for each class
The instructor was available during the specified office hours and for after class consultations
The Instructor provided course split schedule during the 1st week of semester
The course material is modern and updated
The instructor demonstrates knowledge of the subject
The instructor is fair in examination
The instructor arrives on time
The instructor maintains an enviroment that is conducive to learning.
The instructor shows respect towards students and encourages class participation
The instructor communicates the subject matter effectively.
The instructor gives citations regrading current situations with refrence to pakistani context.
The subject matter presented in the course has increased your knowledge of the subject
The instructor leaves on time.
The assigments and exam covered the materials presented in the course
The syllabus clearly states course objectives requirements, procedures and grading criteria.
The instructor returns the graded scripts etc. in a reasonable amount of time.
The instructor provides additional material apart from the textbook
60
50
40
30
20
10
0

Course Evaluation

HORT-301 3(2-2) Introduction to Horticulture Dr. Imran Hassan

Cumulative graph regarding students' opinion for course evaluation questionnaire revealed that most of the students showed strong agreement to the question asked regarding the various aspects of course taught like, course objectives, class environment, ideas presented, course organization etc. A good number of students showed agreement; however few were uncertain or disagreed to the questions asked.



Teacher Evaluation: **Ms. Najma Yousaf Zahid**

Data were collected from 27 B. Sc. students. The individual parameter showed that 60% the students strongly agreed, 38% agreed, 2% uncertain, 0% disagreed and 0% strongly disagreed that the course objectives were clear. The data of other parameters inferred that major proportion of the students are agreed that the teacher was fair in examination , came with good preparation, the instructor demonstrates knowledge of the subject, instructor had completed the whole course, the Instructor provided additional material apart from the textbook, the Instructor gave citations regarding current situations with reference to Pakistani context, the Instructor communicates the subject matter, the Instructor shows respect towards students and encourages class participation effectively, the Instructor maintained an environment that was conducive to learning, the instructor arrived on time, the Instructor returned the graded scripts etc. in a reasonable amount of time, the Instructor was available during the specified office hours after class for consultations.

Comments/Suggestions

1. Kind and good teacher with amiable and parental attitude with the students.
2. Always teaches his practical experiences to make the understanding of the subject effective.
3. Course was accomplished in appropriate time and was very motivating.

Teacher Evaluation Graph
A
B
C
D
E
0
20
40
60
80
100
The instructor leaves on time.
The course integrates theoratical course concepts with real-world applications.
The instructor communicates the subject matter effectively.
The syllabus clearly states course objectives requirements, procedures and grading criteria.
The instructor returns the graded scripts etc. in a reasonable amount of time.
The instructor provides additional material apart from the textbook
The assignments and exam covered the materials presented in the course
The subject matter presented in the course has increased your knowledge of the subject
The instructor is fair in examination
The instructor shows respect towards students and encourages class participation
The instructor demonstrates knowledge of the subject
The instructor is prepared for each class
The course material is modern and updated
The instructor maintains an environment that is conducive to learning.
The instructor gives citations regrading current situations with refrence to pakistani context.
The Instructor provided course split schedule during the 1st week of semester
The instructor was available during the specified office hours and for after class consultations
The instructor arrives on time

Hort-501 3(2-2) Principles of Fruit Production Ms. Najma Yousaf Zahid

As per cumulative graph pertaining to students course evaluation Performa, around 47% students showed strong agreement to the questions asked whereas most of them showed agreement. Small numbers of students were uncertain in answering the questions.

Teacher Evaluation **Dr. Shahid J. Butt**

Data were collected from 43 B.Sc. students. The individual parameters showed that the 73% of the students strongly agreed, 24% agreed, 3% uncertain, 0% disagreed, and 0% strongly disagreed that the teacher is fair in examination. Most of the students agreed that the instructor came with good preparation in each class. Most of the students agreed that instructor demonstrates knowledge of the subject and completed the whole course, he provided additional material apart from the textbook, Citations regarding current situations were imparted, communicates the subject matter, shows respect towards students and encourages class participation effectively, the instructor maintained an environment that was conducive to learning, the instructor arrived on time, the instructor returned the graded scripts etc. in a reasonable amount of time, the instructor was available during the specified office hours after class for consultations, the Subject matter presented in the course has increased their knowledge of the subject.

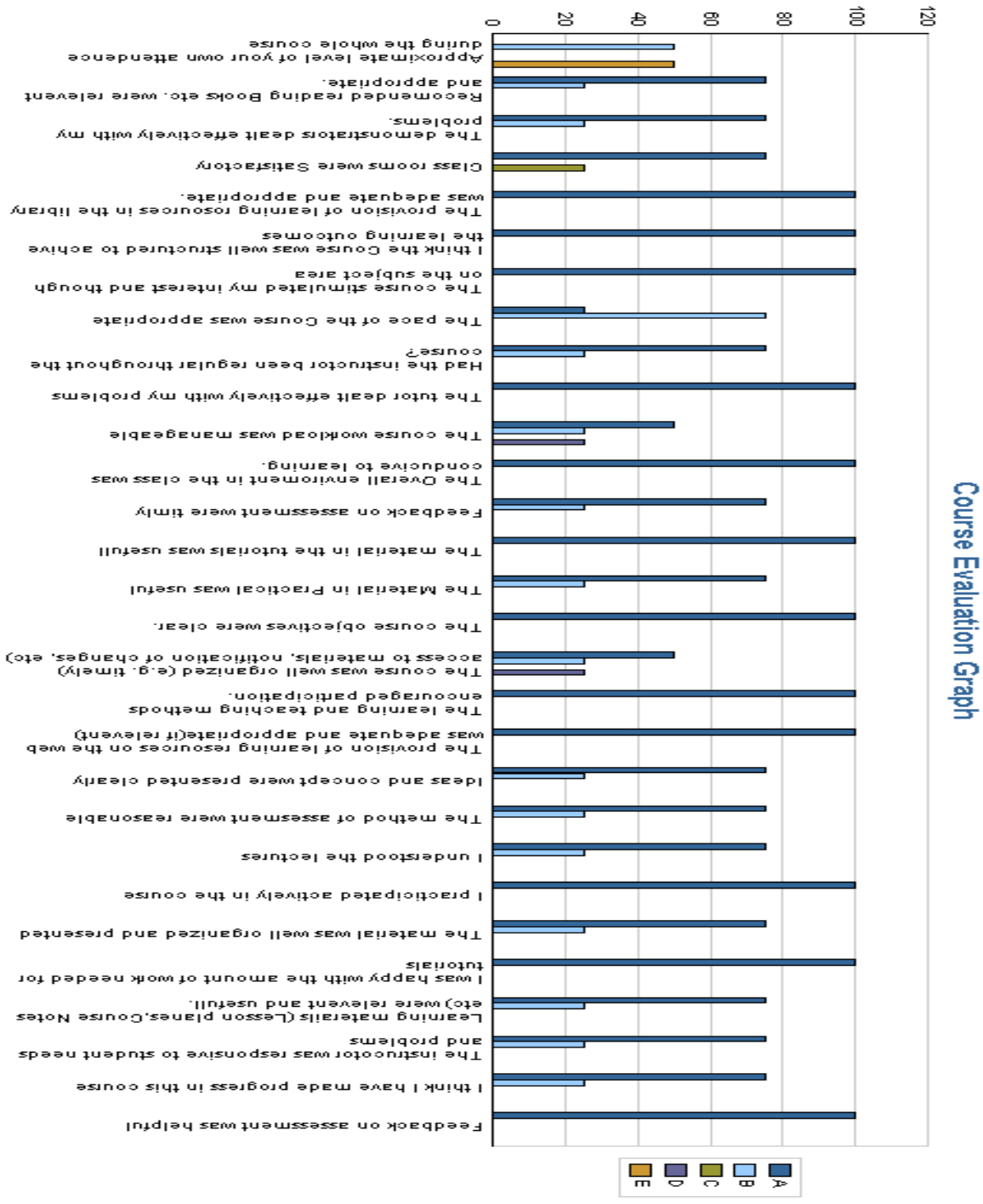
Comments/Suggestions

1. General information given by teacher based on his practical experience from the prevalent environment was indeed very effective.
2. Good behavior of the teacher and was available any time.
3. Course was completed in due time and was very interesting.

Teacher Evaluation Graph
A
B
C
D
E
0
20
40
60
80
100
The instructor was available during the specified office hours and for after class consultations
The instructor returns the graded scripts etc. in a reasonable amount of time.
The instructor maintains an environment that is conducive to learning.
The instructor shows respect towards students and encourages class participation
The instructor is prepared for each class
The instructor provided course split schedule during the 1st week of semester
The course material is modern and updated
The syllabus clearly states course objectives requirements, procedures and grading criteria.
The instructor is fair in examination
The assignments and exam covered the materials presented in the course
The instructor leaves on time.
The subject matter presented in the course has increased your knowledge of the subject
The instructor provides additional material apart from the textbook
The instructor demonstrates knowledge of the subject
The course integrates theoratical course concepts with real-world applications.
The instructor gives citations regrading current situations with refrence to pakistani context.
The instructor arrives on time
The instructor communicates the subject matter effectively.

Hort-503 3(2-2) Principles of Vegetable Production Dr. Shahid J. Butt

The aggregate analysis of Performa 1 revealed that around 61% of the students strongly agreed to the various aspects of course evaluation questionnaire like course objectives, work load, feedback on assessment, usefulness of material in practical etc. Whereas, many of them showed general agreement. About 08% students were uncertain and are disagreed in answering their responses.



Teacher Evaluation **Dr. Amjad Farooq**

Data were collected from 36 B.Sc. students. The individual parameters showed that the 60% of the students strongly agreed, 27% agreed, 7% uncertain, 6% disagreed, and 0 % strongly disagreed that the teacher is fair in examination. Most of the students agreed that the instructor came with good preparation in each class. Most of the students agreed that instructor demonstrates knowledge of the subject, instructor had completed the whole course, the Instructor provided additional material apart from the textbook, the instructor gave citations regarding current situations with reference to Pakistani context, the instructor communicates the subject matter, the instructor shows respect towards students and encourages class participation effectively, the instructor maintained an environment that was conducive to learning, the instructor arrived on time, the instructor returned the graded scripts etc. in a reasonable amount of time, the instructor was available during the specified office hours after class for consultations, the Subject matter presented in the course has increased their knowledge of the subject.

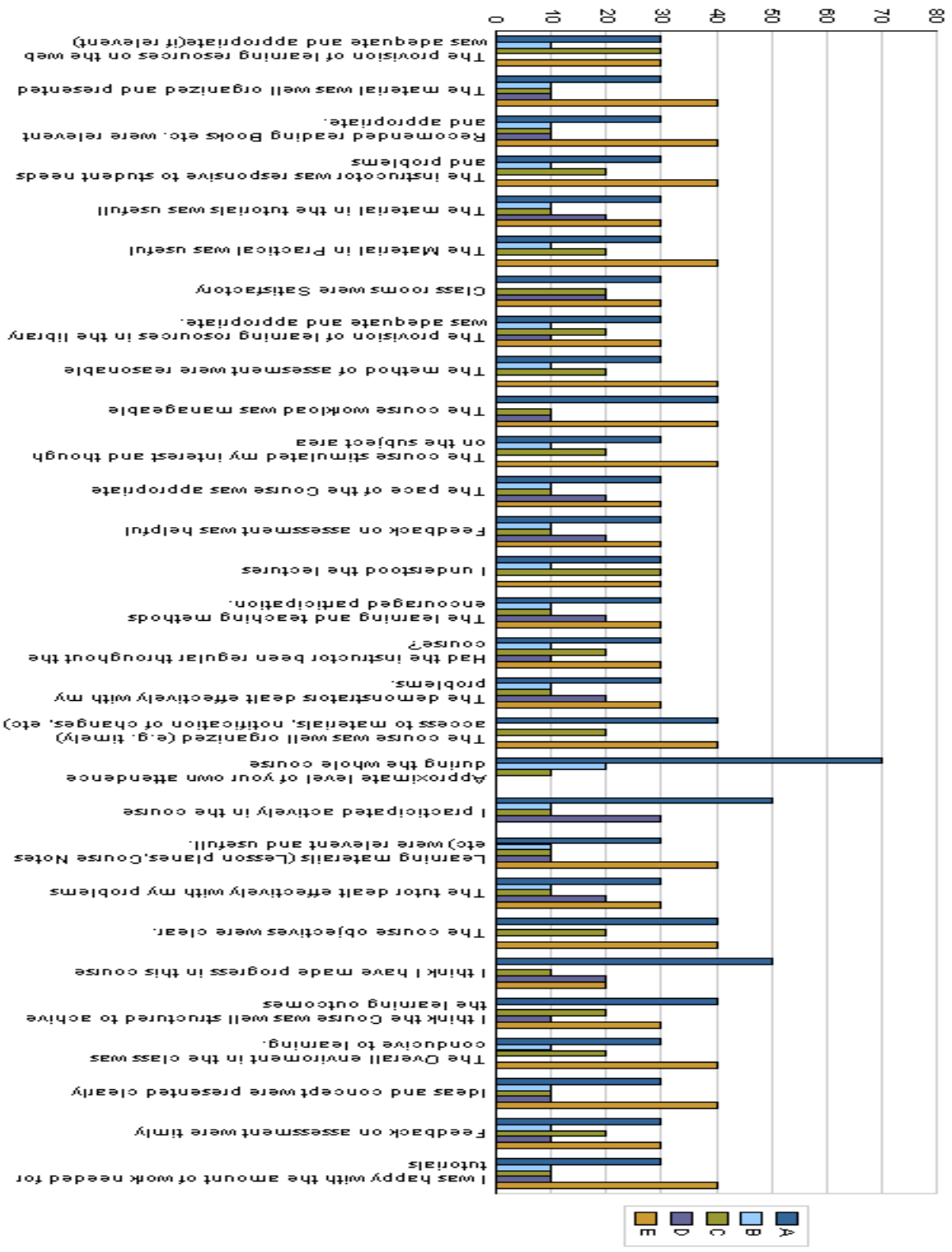
Comments/Suggestions

1. General information given by teacher based on his practical experience from the prevalent environment was indeed very effective
2. Good behavior of the teacher and was available any time.
3. Course was completed in due time and was very interesting.

Teacher Evaluation Graph
A
B
C
D
E
0
20
40
60
80
100
120
The course integrates theoratical couse concepts with real-world applications.
The instructor is fair in examination
The instructor provides additional material apart from the textbook
The instructor provided course split schedule during the 1st week of semester
The instructor was available during the specified office hours and for after class consultations
The instructor maintains an environment that is conducive to learning.
The instructor returns the graded scripts etc. in a reasonable amount of time.
The assignments and exam covered the materials presented in the course
The instructor demonstrates knowledge of the subject
The instructor is prepared for each class
The subject matter presented in the course has increased your knowledge of the subject
The course material is modern and updated
The instructor leaves on time.
The instructor arrives on time
The instructor communicates the subject matter effectively.
The instructor gives citations regrading current situations with refrence to pakistani context.
The syllabus clearly states course objectives requirements, procedures and grading criteria.
The instructor shows respect towards students and encourages class participation

Hort-505 3(2-2) Principles of Ornamental Crop Production Dr. Amjad Farooq

A perusal of Performa 1 depicted that about 43% students strongly agreed to different aspects of course evaluation questionnaire. However, around 37% students were satisfied with the class environment, assessment, L&T method etc. Only a few students were uncertain and disagreed.



Teacher Evaluation **Dr. Muhammad Shafiq**

Data were collected from 22 students. The evaluation criteria parameters showed that the 79% of the students strongly agreed, 21% agreed, 0% uncertain, 0% disagreed, and 0% strongly disagreed that the instructor was prepared for each class. The data of other parameters inferred that major proportion of the students are agreed that, the performance and expertness of the teacher, the instructor came with good preparation. ,instructor demonstrates knowledge of the subject, instructor had completed the whole course, the Instructor provided additional material apart from the textbook, the Instructor gave citations regarding current situations with reference to Pakistani context, the Instructor communicates the subject matter, the Instructor shows respect towards students and encourages class participation effectively, the Instructor maintained an environment that was conducive to learning, the Instructor arrived on time, the Instructor returned the graded scripts etc. in a reasonable amount of time, the Instructor was available during the specified office hours after class for consultations, the Subject matter presented in the course has increased their knowledge of the subject, the syllabus clearly states course objectives requirements, procedures and grading criteria, the course integrates theoretical course concepts with real- world applications, and the assignments and exams covered the materials presented in the course, the course material is modern and updated.

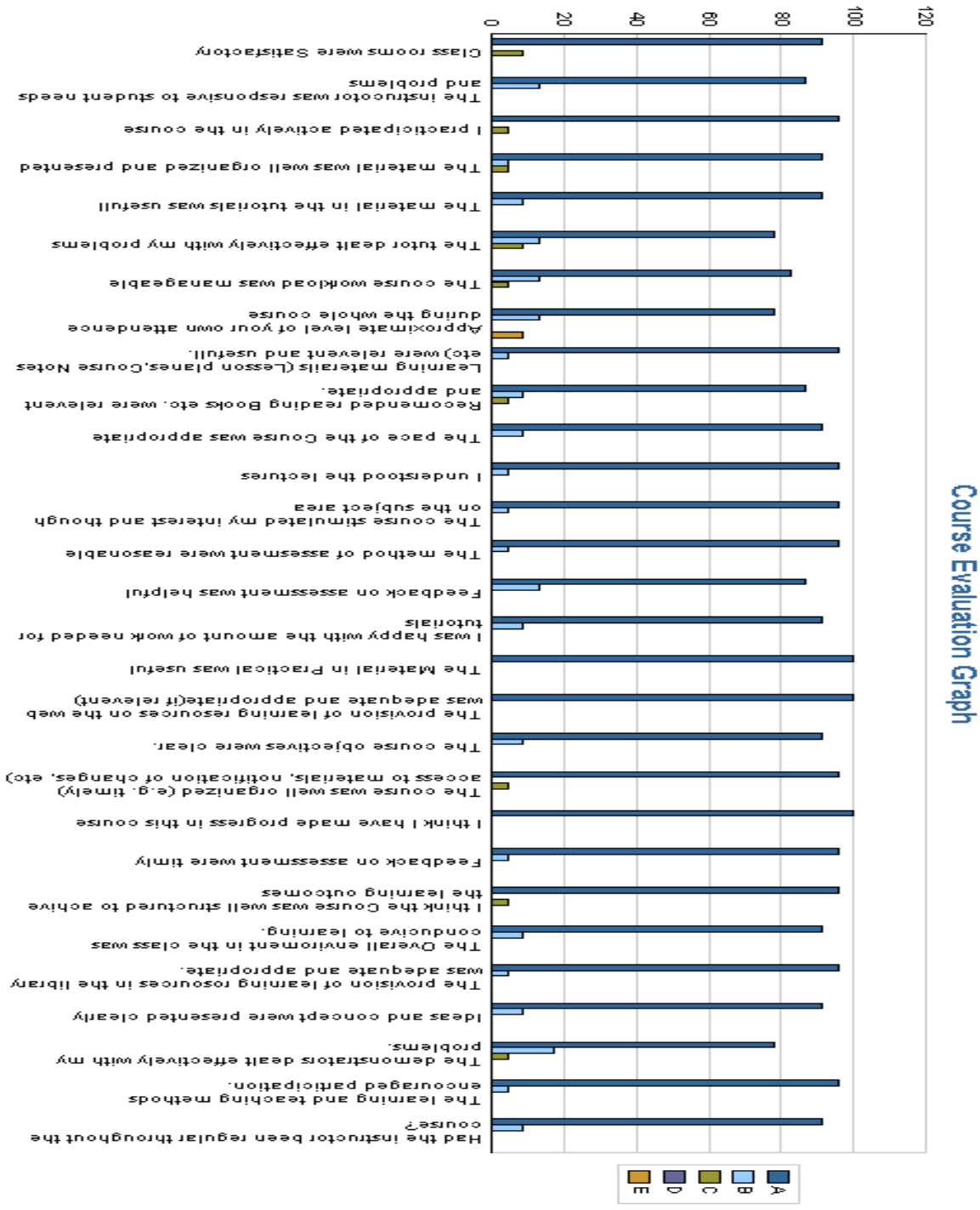
Comments / Suggestions

- Instructor was fine in conduct and always wearisome to assist.
- Instructor was prepared for each class.

Teacher Evaluation Graph
A
B
C
D
E
0
20
40
60
80
100
The instructor leaves on time.
The Instructor provided course split schedule during the 1st week of semester
The instructor shows respect towards students and encourages class participation
The instructor gives citations regrading current situations with refrence to pakistani context.
The instructor is prepared for each class
The instructor provides additional material apart from the textbook
The course material is modern and updated
The instructor is fair in examination
The instructor demonstrates knowledge of the subject
The subject matter presented in the course has increased your knowledge of the subject
The syllabus clearly states course objectives requirements, procedures and grading criteria.
The instructor returns the graded scripts etc. in a reasonable amount of time.
The instructor maintains an environment that is conducive to learning.
The instructor communicates the subject matter effectively.
The assigments and exam covered the materials presented in the course
The instructor was available during the specified office hours and for after class consultations
The instructor arrives on time
The course integrates theoratical course concepts with real-world applications.

Hort-507 4(3-2) Arid Horticulture Dr. Muhammad Shafiq

As regards cumulative student course evaluation graph, around 59% students expressed strong agreement on questions asked regarding course progress, learning outcomes, L&T methods, pace of course, feedback, usefulness of materials, and similar number of students showed agreement. However, about 13% students were uncertain in answering the questions and are disagreed with the contents.



Teacher Evaluation **Mr. Usman Shaukat Qureshi**

Data were collected from 50 students. The individual parameter showed that the students are strongly agreed (62% and 64 % respectively) that the teacher is prepared for each class and demonstrate the subject knowledge in a very effective way. More than 90 % of the students were strongly agreed and agreed that the instructor has completed whole the course in time, provide additional information and also fair in examination. Similarly, most of the students agreed that instructor showed respect towards students and encourages class participation effectively; the Instructor maintained an environment that was conducive to learning. More than 90% students are of the view that the Instructor arrived and leave the class on time and returned the graded scripts etc. in a reasonable amount of time. Most of the students agreed that the Instructor was available during the specified office hours after class for consultations, the Subject matter presented in the course has increased their knowledge of the subject, the syllabus clearly states course objectives requirements and the assignments and exams covered the materials presented in the course, the course material is modern and updated.

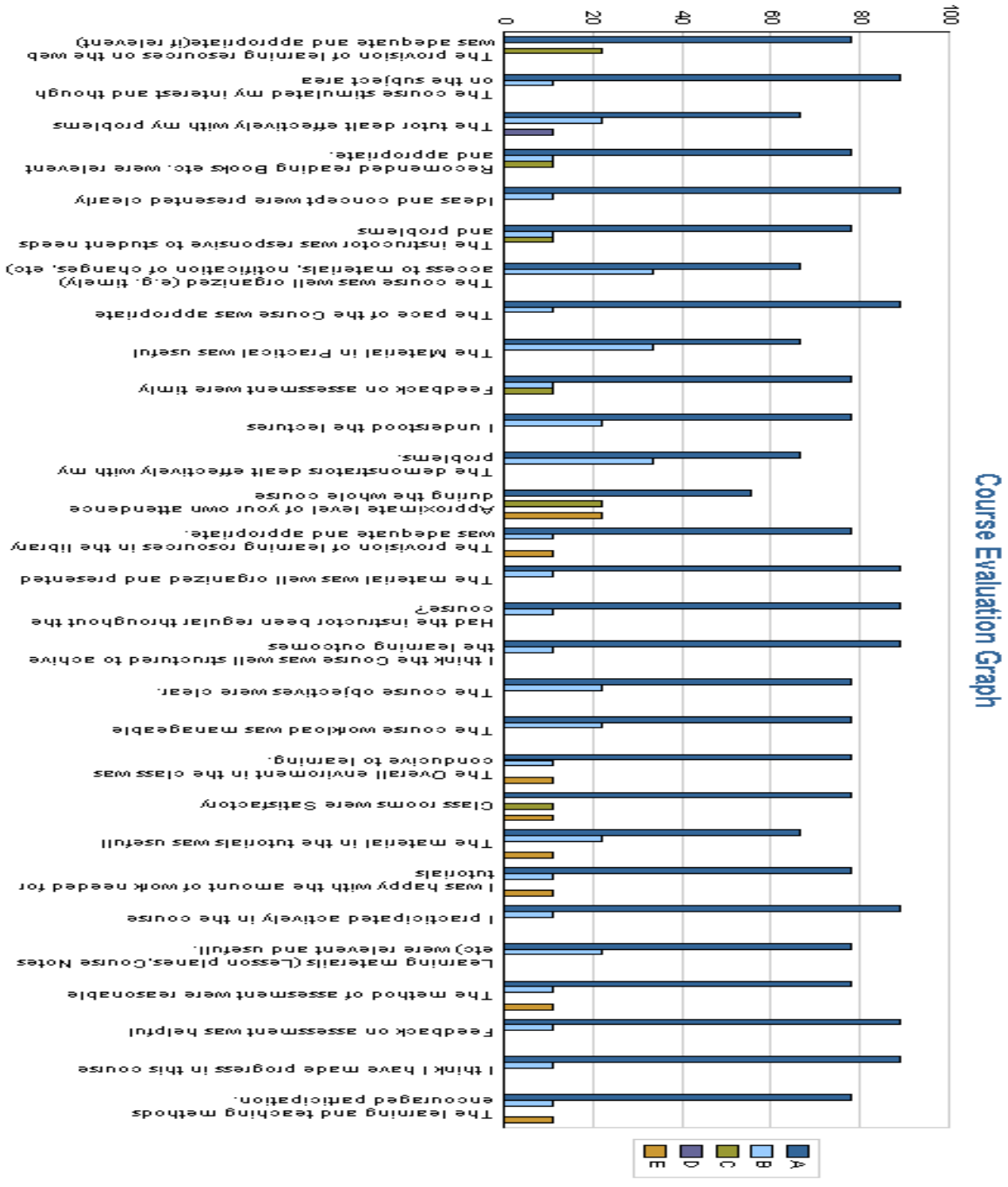
COMMENTS / SUGGESTIONS

1. Environment was friendly and conducive for learning.
2. Good way of teaching.
3. Scientific approach with good communication skills.
4. Teacher was punctual reached and leave the class in time.

Teacher Evaluation Graph
A
B
C
D
E
0
10
20
30
40
50
60
70
80
The course material is modern and updated
The instructor provides additional material apart from the textbook
The instructor shows respect towards students and encourages class participation
The instructor communicates the subject matter effectively.
The syllabus clearly states course objectives requirements, procedures and grading criteria.
The subject matter presented in the course has increased your knowledge of the subject
The instructor leaves on time.
The instructor gives citations regrading current situations with refrence to pakistani context.
The instructor is prepared for each class
The instructor provided course split schedule during the 1st week of semester
The instructor returns the graded scripts etc. in a reasonable amount of time.
The instructor demonstrates knowledge of the subject
The assigments and exam covered the materials presented in the course
The instructor is fair in examination
The course integrates theoratical course concepts with real-world applications.
The instructor arrives on time
The instructor was available during the specified office hours and for after class consultations
The instructor maintains an environment that is conducive to learning.

Hort-509 2(1-2) Medicinal and aromatic plants Mr. Usman Shaukat Qureshi

The aggregate analysis regarding Medicinal and aromatic plants course, revealed that around 73% students strongly agreed to the various aspects of course evaluation questionnaire like course progress, participation, learning outcomes, L&T methods, pace of course, feedback on course and assessment, usefulness of materials, whereas, 13% students showed general agreement. However, a small proportion of students were uncertain in their response.



Teacher Evaluation **Dr. Khalid Mahmood Qureshi**

Data were collected from 53 B. Sc. students. The individual parameters showed that the 40%of the students strongly agreed, 46% agreed, 9% uncertain, 5% disagreed, and 0% strongly disagreed that the instructor was prepared for each class. The data of rest of the parameters inferred that major proportion of the students are agreed that the teacher is fair in examination, the instructor came with good preparation the instructor demonstrates knowledge of the subject, instructor had completed the whole course, the instructor provided additional material apart from the textbook, the instructor gave citations regarding current situations with reference to Pakistani context, the instructor communicates the subject matter, the instructor shows respect towards students and encourages class participation effectively, the instructor maintained an environment that was conducive to learning, the instructor arrived on time, the instructor returned the graded scripts etc. in a reasonable amount of time, the instructor was available during the specified office hours after class for consultations, the Subject matter presented in the course had increased their knowledge of the subject, the syllabus clearly states course objectives requirements, procedures and grading criteria, the course integrates theoretical course concepts with real-world applications, and the assignments and exams covered the materials presented in the course, the course material is modern and updated.

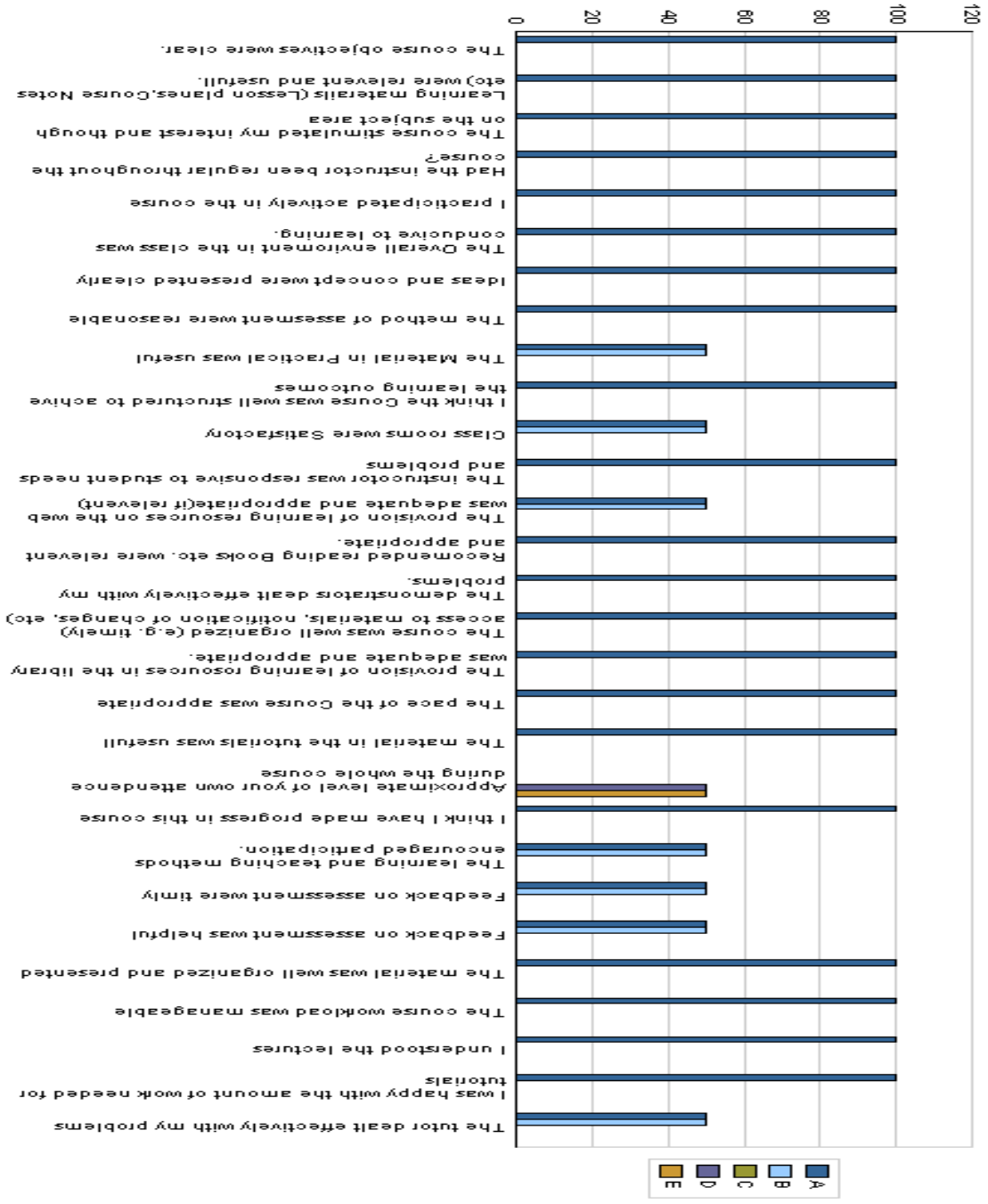
Comments / Suggestions

i. He conveyed the lectures in such a way that we understood them properly.
ii. Need of more practical work in labs.
iii. Good behavior of the teacher and was available in most of the time.
iv. Completed course in time.
v. Prepared for each class.
vi. He had full command in his subject.

Teacher Evaluation Graph
A
B
C
D
E
0
20
40
60
80
100
120
The syllabus clearly states course objectives requirements, procedures and grading criteria.
The instructor maintains an environment that is conducive to learning.
The instructor is prepared for each class
The instructor demonstrates knowledge of the subject
The couse material is modern and updated
The instructor gives citations regrading current situations with refrence to pakistani context.
The instructor provides additional material apart from the textbook
The couse integrates theoratical couse concepts with real-world applications.
The instructor communicates the subject matter effectively.
The instructor was available during the specified office hours and for after class consultations
The instructor shows respect towards students and encourages class participation
The assigments and exam covered the materials presented in the couse
The subject matter presented in the couse has increased your knowledge of the subject
The instructor returns the graded scripts etc. in a reasonable amount of time.
The instructor arrives on time
The instructor is fair in examination
The instructor leaves on time.
The instructor provided couse split schedule during the 1st week of semester

Hort-603 2(1-2) Arid Zone Horticulture Dr. Khalid Mahmood Qureshi

A perusal of student course evaluation Performa 1, expressed that about 63% students showed strong agreement on questions asked like course organization, learning outcomes, learning resources, L&T methods, feedback, assessment, and dealing of problems whereas 17% showed agreement. However, about 15% students were uncertain in answering the questions, and a few disagreed with the contents.



Teacher Evaluation **Dr. Nadeem Akhtar Abbasi**

Data were collected from 83 students which showed that the students were strongly agreed (37% and 31 % respectively) that the teacher is prepared for each class and demonstrate the subject knowledge in a very effective way. More than 70 % of the students were strongly agreed and agreed that the instructor has completed whole the course in time, provide additional information and also fair in examination. Similarly, most of the students agreed that instructor showed respect towards students and encourages class participation effectively; the Instructor maintained an environment that was conducive to learning. More than 80% students are of the view that the Instructor arrived and leave the class on time and returned the graded scripts etc. in a reasonable time. Most of the students agreed that the Instructor was available during the specified office hours after class for consultations, the Subject matter presented in the course has increased their knowledge of the subject, the syllabus clearly states course objectives requirements and the assignments and exams covered the materials presented in the course, the course material is modern and updated.

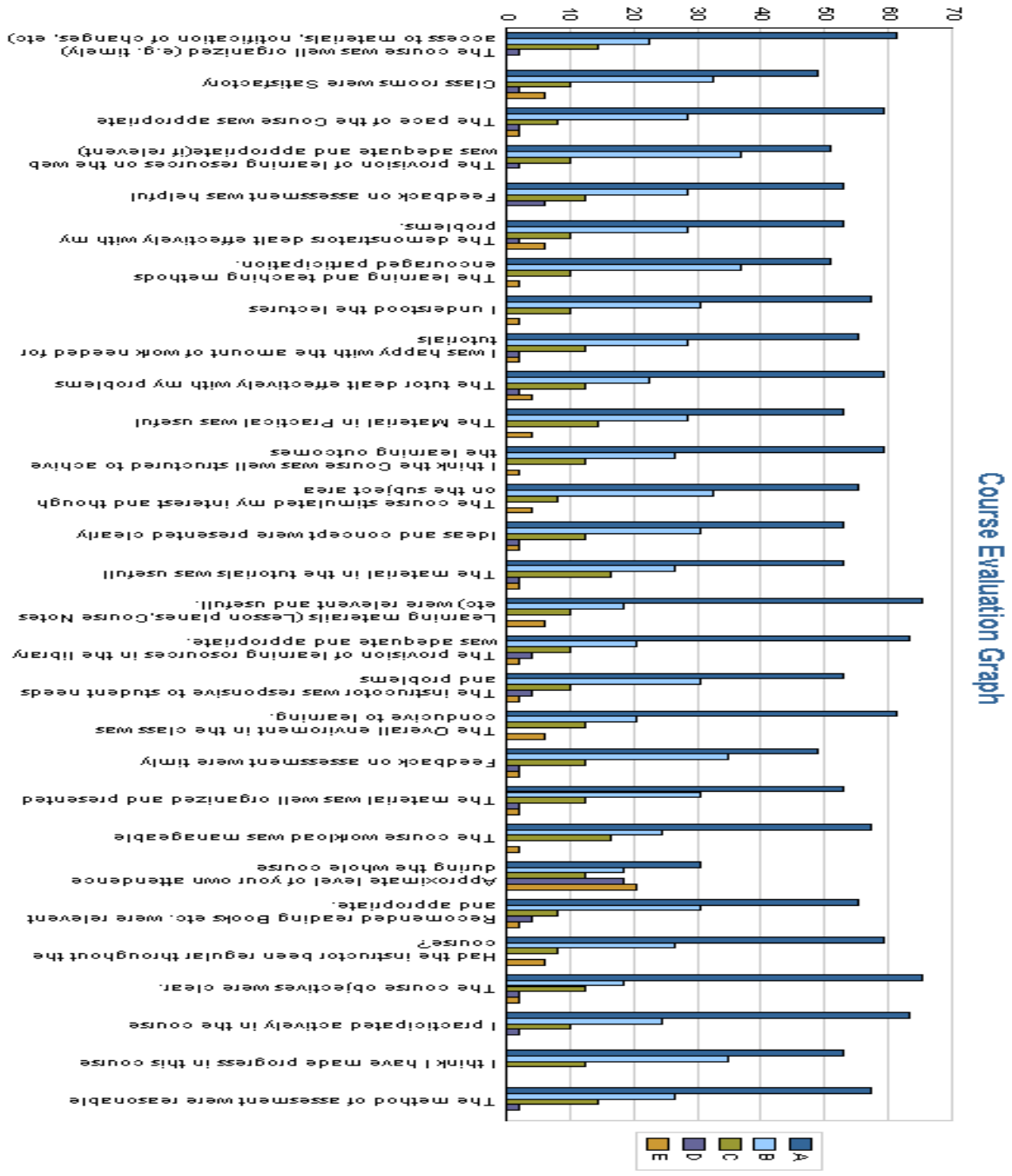
COMMENTS / SUGGESTIONS

1. Environment was friendly.
2. Teaching method was good.
3. Has scientific approach with good communication skills.
4. Teacher was punctual reached and leave the class in time

Teacher Evaluation Graph
A
B
C
D
E
0
20
40
60
80
100
120
The assigments and exam covered the materials presented in the course
The course integrates theoratical course concepts with real-world applications.
The syllabus clearly states course objectives requirements, procedures and grading criteria.
The instructor gives citations regrading current situations with refrence to pakistani context.
The instructor provides additional material apart from the textbook
The instructor returns the graded scripts etc. in a reasonable amount of time.
The subject matter presented in the course has increased your knowledge of the subject
The instructor arrives on time
The instructor shows respect towards students and encourages class particpation
The instructor was available during the specified office hours and for after class consultations
The instructor leaves on time.
The instructor communicates the subject matter effectively.
The instructor is fair in examination
The instructor demonstrates knowledge of the subject
The instructor maintains an environment that is conducive to learning.
The instructor is prepared for each class
The instructor provided course split schedule during the 1st week of semester
The couse material is modern and updated

Hort-605 3(2-2) Protected Vegetable Farming Dr. Nadeem Akhtar Abbasi

The graphical analysis of Performa 1, expressed that about 59% students strongly agreed to the various aspects of course evaluation questionnaire like work load, course objectives, course progress, learning outcomes, L&T methods, pace of course Protected Vegetable Farming, assessment and understanding, feedback, usefulness of materials etc. Around 20% students showed general agreement with various aspects of Performa. About 07% students were uncertain in answering the questions.



Teacher Evaluation **Ms. Mehwish Yaseen**

Data were collected from 47 B. Sc. students. The individual parameters showed that the 52%of the students strongly agreed, 34% agreed, 7% uncertain, 5% disagreed, and 2% strongly disagreed that the instructor was prepared for each class. The data of rest of the parameters inferred that major proportion of the students are agreed that the teacher is fair in examination, the instructor came with good preparation the instructor demonstrates knowledge of the subject, instructor had completed the whole course, the instructor provided additional material apart from the textbook, the instructor gave citations regarding current situations with reference to Pakistani context, the instructor communicates the subject matter, the instructor shows respect towards students and encourages class participation effectively, the instructor maintained an environment that was conducive to learning, the instructor arrived on time, the instructor returned the graded scripts etc. in a reasonable amount of time, the instructor was available during the specified office hours after class for consultations, the Subject matter presented in the course had increased their knowledge of the subject, the syllabus clearly states course objectives requirements, procedures and grading criteria, the course integrates theoretical course concepts with real-world applications, and the assignments and exams covered the materials presented in the course, the course material is modern and updated.

Comments / Suggestions

- He conveyed the lectures in a conceptual way.
- More practical must be arranged in labs.
- Prepared for each class.
- Good behavior of the teacher and was available any time.
- Completed course in time.

Teacher Evaluation Graph
A
B
C
D
E
0
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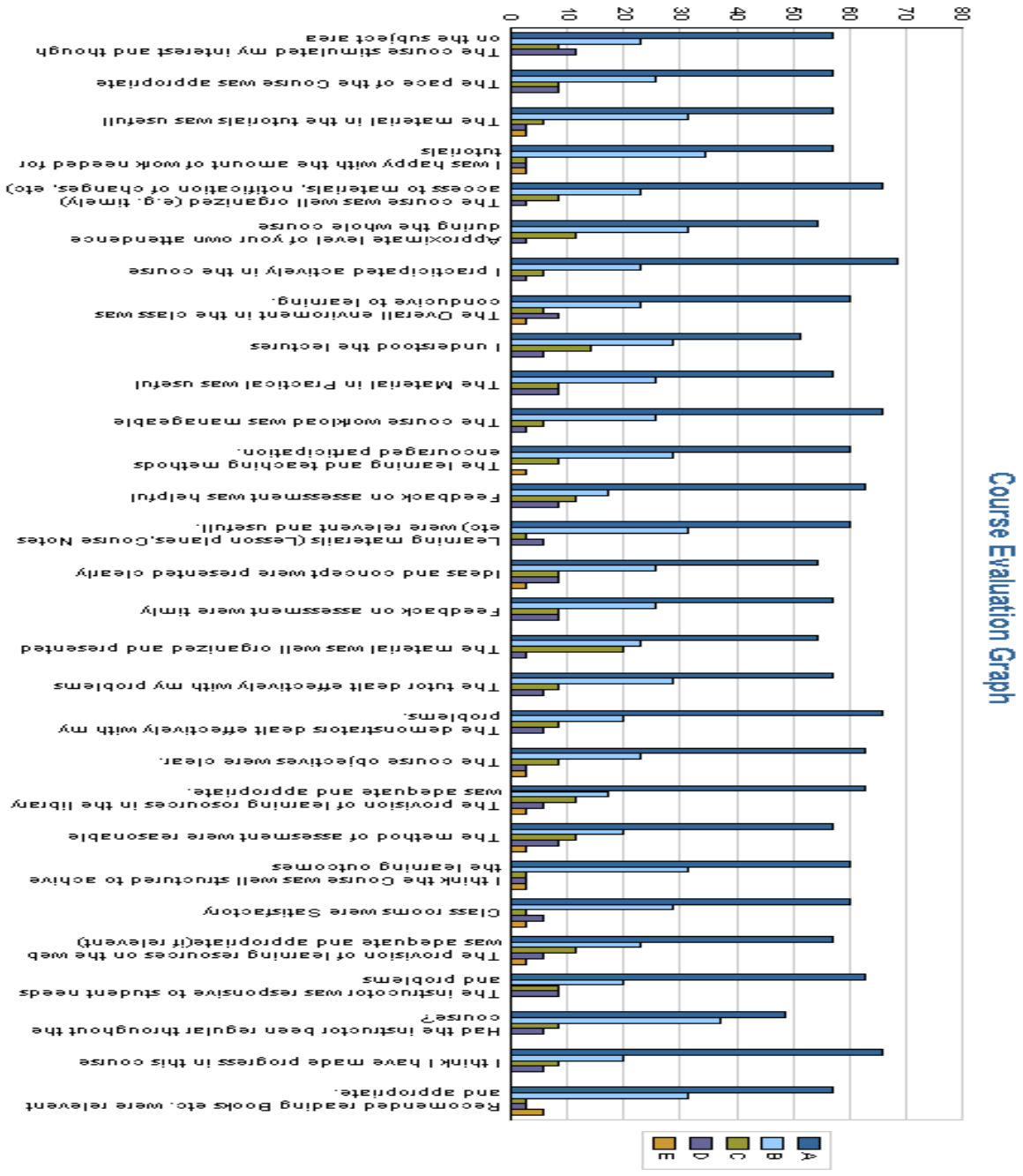
40
60
80
100
The instructor leaves on time.
The instructor shows respect towards students and encourages class participation
The syllabus clearly states course objectives requirements, procedures and grading criteria.
The instructor communicates the subject matter effectively.
The instructor provides additional material apart from the textbook
The instructor gives citations regrading current situations with refrence to pakistani context.
The instructor is prepared for each class
The Instructor provided course split schedule during the 1st week of semester
The course material is modern and updated
The assigments and exam covered the materials presented in the course
The instructor is fair in examination
The instructor demonstrates knowledge of the subject
The instructor arrives on time
The course integrates theoratical course concepts with real-world applications.
The subject matter presented in the course has increased your knowledge of the subject
The instructor was available during the specified office hours and for after class consultations
The instructor returns the graded scripts etc. in a reasonable amount of time.
The instructor maintains an environment that is conducive to learning.

The cumulative analysis for Performa 1, suggested that 57% students strongly agreed to difference aspects of course evaluation questionnaire like work load, course objectives and organization, course progress, learning materials, L&T methods, pace of course, assessment and timely feedback, usefulness of materials etc. Around 43% students were in general agreement. Only a small proportion of students was uncertain in and/or disagreed.



Teacher Evaluation **Ms. Najma Yousaf Zahid**

Data were collected from 57 B. Sc students. The individual parameters showed that the 41% of the students strongly agreed, 37% agreed, 9% uncertain, 8% disagreed, and 4% strongly disagreed that the teacher prepared for each class. Similarly, most of the students agreed that instructor demonstrates knowledge of the subject, instructor had completed the whole course, the Instructor provided additional material apart from the textbook, the Instructor gave citations regarding current situations with reference to Pakistani context, the Instructor shows respect towards students and encourages class participation effectively, the instructor maintained an environment that was conducive to learning, the Instructor arrived on time, the Instructor returned the graded scripts etc. in a reasonable amount of time, the Instructor was available during the specified office hours after class for consultations, the Subject matter presented in the course has increased their knowledge of the subject, the syllabus clearly states course objectives requirements, procedures and grading criteria, the course integrates theoretical course concepts with real-world applications, and the assignments and exams covered the materials presented in the course, the course material is updated.

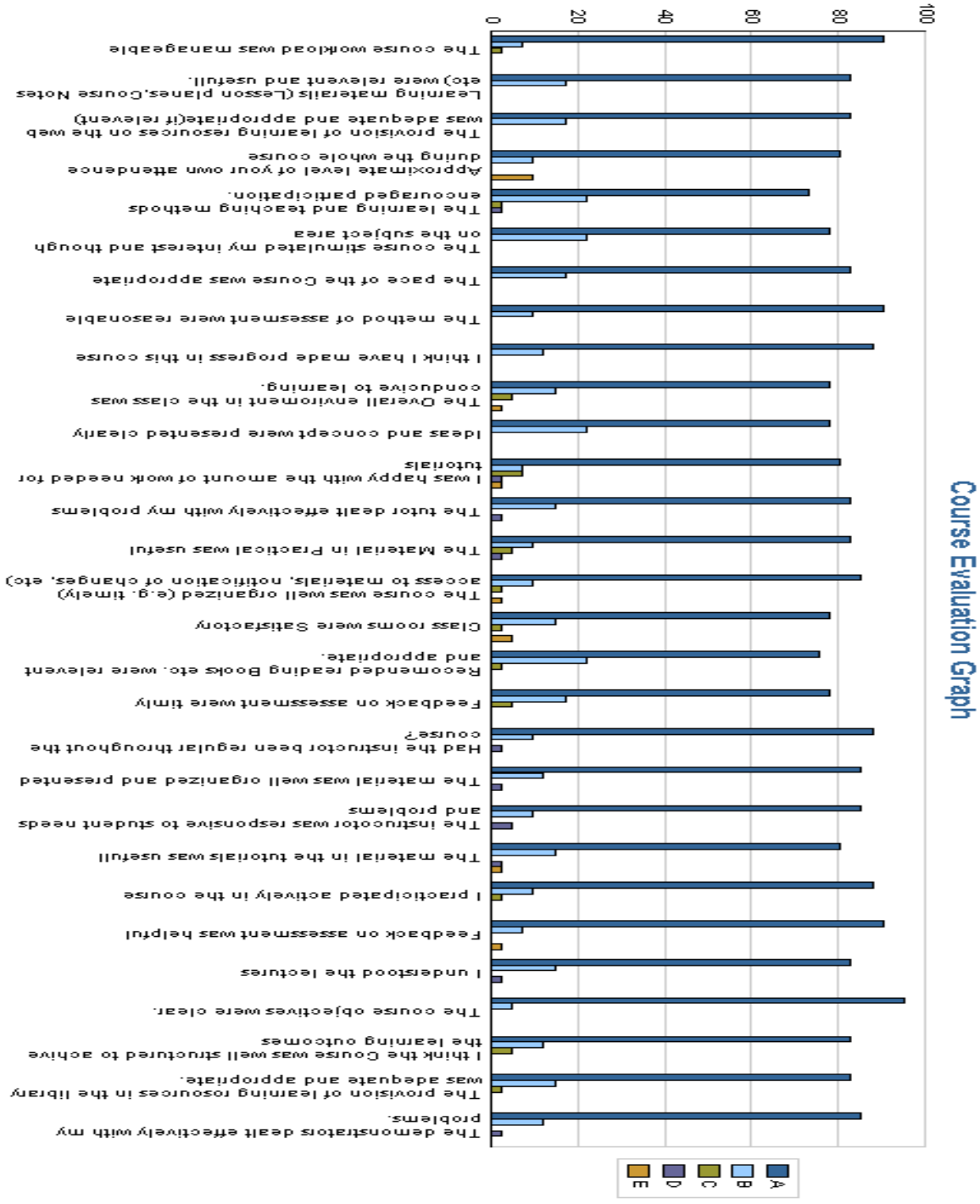
Comments / Suggestions

1. Scientific approach of teaching.
2. Environment was gracious and supportive.
3. Good way of teaching, a man of foresight

Teacher Evaluation Graph
A
B
C
D
E
0
20
40
60
80
100
The instructor arrives on time
The instructor is fair in examination
The course material is modern and updated
The instructor provided course split schedule during the 1st week of semester
The syllabus clearly states course objectives requirements, procedures and grading criteria.
The assigments and exam covered the materials presented in the course
The instructor is prepared for each class
The instructor demonstrates knowledge of the subject
The instructor provides additional material apart from the textbook
The subject matter presented in the course has increased your knowledge of the subject
The instructor gives citations regrading current situations with refrence to pakistani context.
The instructor shows respect towards students and encourages class participation
The instructor maintains an environment that is conducive to learning.
The instructor was available during the specified office hours and for after class consultations
The course integrates theoratical course concepts with real-world applications.
The instructor communicates the subject matter effectively.
The instructor returns the graded scripts etc. in a reasonable amount of time.
The instructor leaves on time.

Hort-501 3(2-2) Principles of Fruit Production Ms. Najma Yousaf Zahid

The graphic analysis showed that about 81% students strongly agreed to the various aspects of course evaluation questionnaire like work load, course objectives, course progress, participation, learning outcomes, L&T methods, pace of course, assessment, feedback, usefulness of materials etc. About, 12% students showed general agreement and a small number of students were uncertain in answering the questions.



Teacher Evaluation **Dr. Shahid J. Butt**

Data were collected from 48 B. Sc. students. The evaluation criteria parameters showed that the 65% of the students strongly agreed, 26% agreed, 8% uncertain, 1% disagreed, and 0% strongly disagreed that the instructor was prepared for each class. The data of other parameters inferred that major proportion of the students are agreed that the teacher was fair in examination, came with good preparation, the instructor demonstrates knowledge of the subject, instructor had completed the whole course, the Instructor provided additional material apart from the textbook, the Instructor gave citations regarding current situations with reference to Pakistani context, the Instructor communicates the subject matter, the Instructor shows respect towards students and encourages class participation effectively, the Instructor maintained an environment that was conducive to learning, the instructor arrived on time, the Instructor returned the graded scripts etc. in a reasonable amount of time, the Instructor was available during the specified office hours after class for consultations.

Comments/Suggestions

1. Kind and good teacher with amiable and parental attitude with the students.
2. Always teaches his practical experiences to make the understanding of the subject effective.
3. Course was accomplished in appropriate time and was very motivating.

Teacher Evaluation Graph
A
B
C
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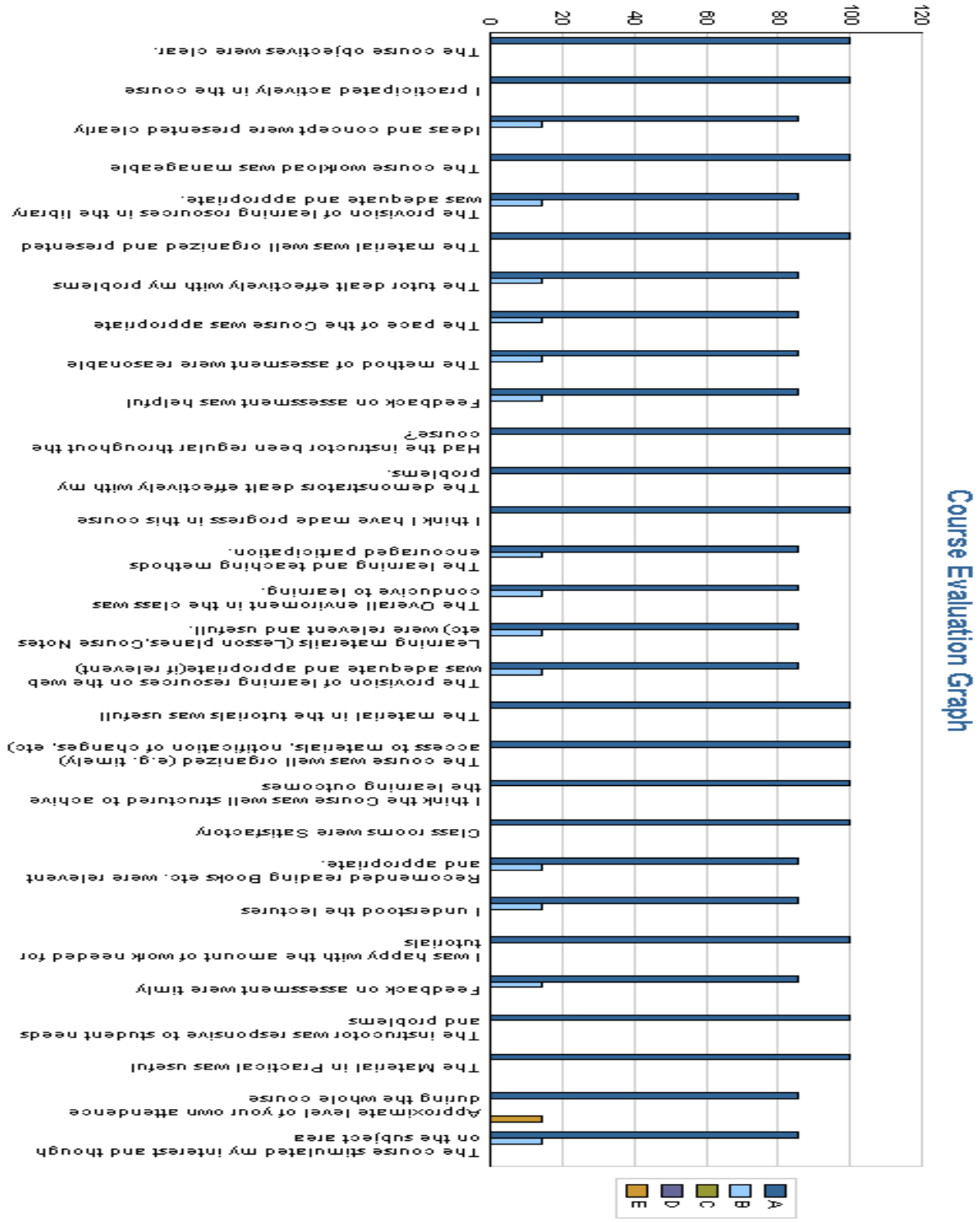
80
100
The course integrates theoratical course concepts with real-world applications.
The instructor leaves on time.
The instructor arrives on time
The instructor maintains an environment that is conducive to learning.
The instructor demonstrates knowledge of the subject
The subject matter presented in the course has increased your knowledge of the subject
The instructor returns the graded scripts etc. in a reasonable amount of time.
The Instructor provided couse split schedule during the 1st week of semester
The course material is modern and updated
The instructor shows respect towards students and encourages class participation
The assigments and exam covered the materials presented in the course
The instructor was available during the specified office hours and for after class consultations
The instructor is fair in examination
The instructor gives citations regrading current situations with refrence to pakistani context.
The instructor provides additional material apart from the textbook
The syllabus clearly states course objectives requirements, procedures and grading criteria.
The instructor communicates the subject matter effectively.
The instructor is prepared for each class

Hort-503 3(2-2) Principles of Vegetable Production Dr. Shahid J. Butt

The analysis for Performa 1, revealed that 90% students strongly agreed to difference aspects of course evaluation questionnaire like, course objectives, pace of course, ideas presented, assessment and feedback, usefulness of materials and demonstration etc. About 04% students were in general agreement with various aspects of Performa and a few students were uncertain.



Teacher Evaluation **Mr. Usman Shaukat Qureshi**

Data were collected from 50 M. Sc. students. The individual parameters showed that the 46%of the students strongly agreed, 43% agreed, 7% uncertain, 2% disagreed, and 2% strongly disagreed that the instructor was prepared for each class. The data of rest of the parameters inferred that major proportion of the students are agreed that the teacher is fair in examination, the instructor came with good preparation the instructor demonstrates knowledge of the subject, instructor had completed the whole course, the instructor provided additional material apart from the textbook, the instructor gave citations regarding current situations with reference to Pakistani context, the instructor communicates the subject matter, the instructor shows respect towards students and encourages class participation effectively, the instructor maintained an environment that was conducive to learning, the instructor arrived on time, the instructor returned the graded scripts etc. in a reasonable amount of time, the instructor was available during the specified office hours after class for consultations, the Subject matter presented in the course had increased their knowledge of the subject, the syllabus clearly states course objectives requirements, procedures and grading criteria, the course integrates theoretical course concepts with real-world applications, and the assignments and exams covered the materials presented in the course, the course material is modern and updated.

Comments / Suggestions

- He conveyed the lectures in a conceptual way.
- More practicals must be arranged in labs.
- Prepared for each class.
- Good behavior of the teacher and was available any time.

Teacher Evaluation Graph
A
B
C
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E
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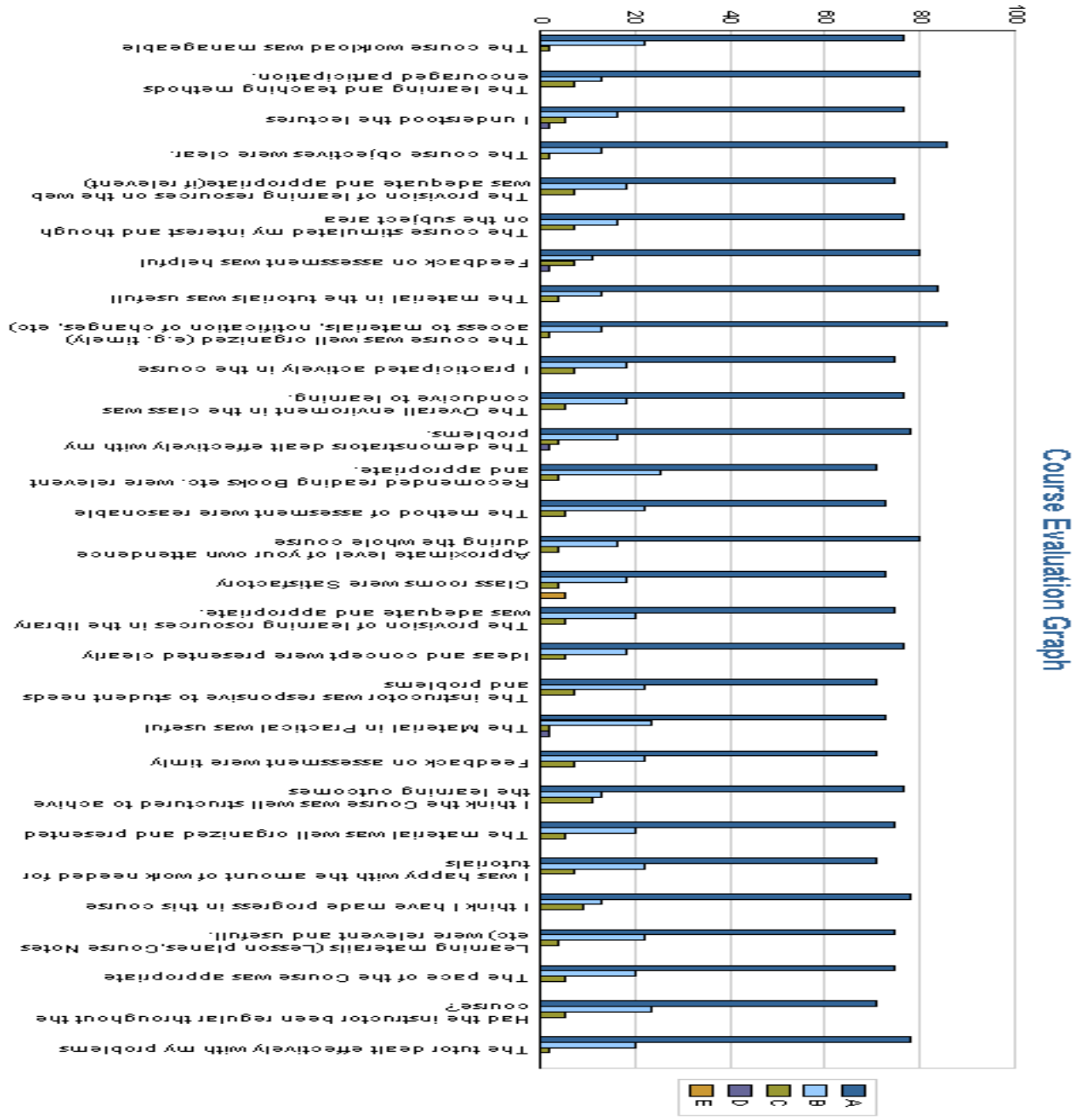
30
40
50
60
70
80
The course integrates theoratical course concepts with real-world applications.
The assigments and exam covered the materials presented in the course
The subject matter presented in the course has increased your knowledge of the subject
The instructor was available during the specified office hours and for after class consultations
The instructor demonstrates knowledge of the subject
The course material is modern and updated
The instructor is fair in examination
The instructor returns the graded scripts etc. in a reasonable amount of time.
The instructor arrives on time
The instructor is prepared for each class
The instructor shows respect towards students and encourages class participation
The instructor provides additional material apart from the textbook
The syllabus clearly states course objectives requirements, procedures and grading criteria.
The instructor leaves on time.
The Instructor provided course split schedule during the 1st week of semester
The instructor maintains an environment that is conducive to learning.
The instructor communicates the subject matter effectively.
The instructor gives citations regrading current situations with refrence to pakistani context.

Hort-505 3(2-2) Principles of Ornamental Crop Production Mr. Usman Shaukat Qureshi

The aggregate analysis for Performa 1, showed that about 65% students strongly agreed to difference aspects of course evaluation questionnaire viz. course objectives, learning outcomes, class environment, pace of course, assessment and feedback, usefulness of materials, dealing of problems etc. About 25% students were in general agreement with various aspects of Performa.



Perform 2

Faculty Course Review Report

This Performa deals with faculty course review report to be filled by each teacher at the course completion. The mode of examination is based on 30% mid & 60% final exams with 10% evaluation for assignments during the study programmed. The overall comments are summarized as below:

Course code	Title	Credit Value	Assessment Methods/ Exams	No. of Students	comments on curriculum	Any changes for future in course	Semester	Course Instructor
Hort-301	Introductory Horticulture	3(2-2)	Mid term And Final	189	Good	Should Be divided	Fall	Dr. Imran Hassan
Hort-501	Principles of Fruit Production	3(2-2)	Mid term And Final	191	Good but lengthy	Should be divided	Spring	Ms. Najma Yousaf Zahid
Hort-503	Principles of Vegetable Production	3(2-2)	Mid term And Final	196	Good	Should be divided	Fall	Dr. Shahid J. Butt
Hort-505	Principles of Ornamental Crop Production	3(2-2)	Mid term And Final	195	Excellent but lengthy	Should be divided	Spring	Dr. Amjad Farooq
Hort-507	Arid Horticulture	4(3-2)	Mid term And Final	187	Very good	No	Fall	Dr. Muhammad Shafiq
Hort-509	Medicinal and aromatic plants	2(1-2)	Mid term And Final	25	Well prepared	No	Spring	Mr. Usman Shaukat Qureshi
Hort-601	Commercial Flower Production	3(2-2)	Mid term And Final	25	Well prepared	No	Fall	Mr. Usman Shaukat Qureshi

Hort-603	Arid Zone Horticulture	2(1-2)	Mid term And Final	25	Well prepared	No	Fall	Dr. Khalid Mahmood Qureshi
Hort-605	Protected Vegetable Farming	3(2-2)	Mid term &Final	28	Well prepared	No	Fall	Dr. Nadeem Akhtar Abbasi
Hort-607	In-Vitro Propagation of Horticultural Crops	2(1-2)	Mid term	22	Very	No	Sprin g	Ms. Mehwish Yaseen
Hort-501	Principles of Fruit Production	3(2-2)	Mid term And Final	15	Well prepared	No	Fall	Ms. Najma Yousaf Zahid
Hort-503	Principles of Vegetable Production	3(2-2)	Mid term And Final	35	Well prepared	No	Sprin g	Dr. Shahid J. Butt
Hort-505	Principles of Ornamental Crop Production	3(2-2)	Mid term And Final	28	Good	No	Fall	Mr. Usman Shaukat Qureshi

The students are assessed by the exam, assignments, practical work and presentations.

All courses are taught as followed by the curriculum revised by the HEC curriculum committee. The assignment standard during the course of semester was satisfactory to great extent. It was realized that the changes proposed in earlier faculty course review report improved the quality of courses undertaken. The comments were cited that the constructive changes for research and teaching will be proposed in future.

General Remarks

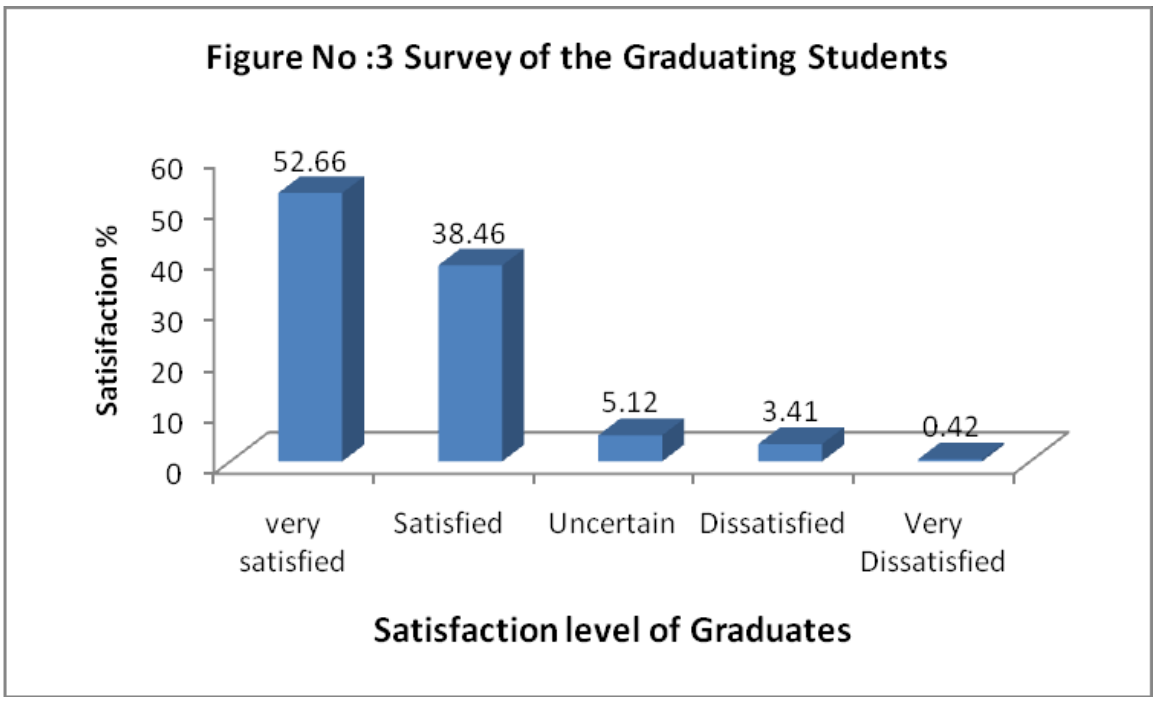
- It is also suggested that basic structure shall be bettered with faculty staff expended so that to upgrade the level of department into institute etc.
- It is commended that financial management system is too length and takes a lot time to follow the process. It may be simplified and be efficient.

The faculty staff unanimously opined to improve the efficiency of administration routine work and student teacher coordination.

Performa 3: Survey of Graduating Students

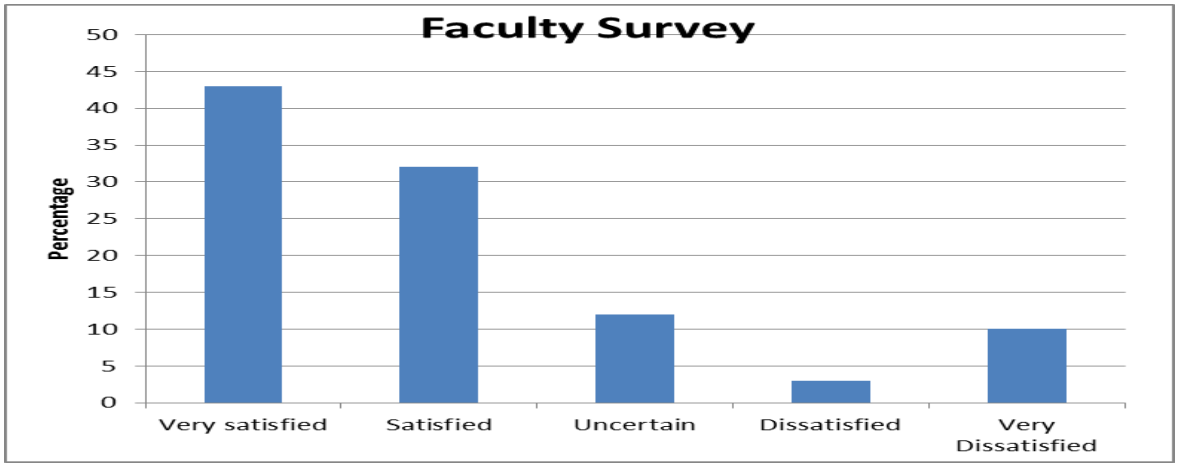
Results of survey of graduating students based on Performa 3 (Annexure III) are given in Figure- 3. The graduating students in the last semester were surveyed before the

award of degree. On the average basis 52.66 % students showed their high satisfaction regarding all the parameters, whereas 38.46 % of the students surveyed were satisfied regarding all information asked. The results of graduating students are summarized and given in Figure No. 3



Performa 5: Results of Faculty Survey

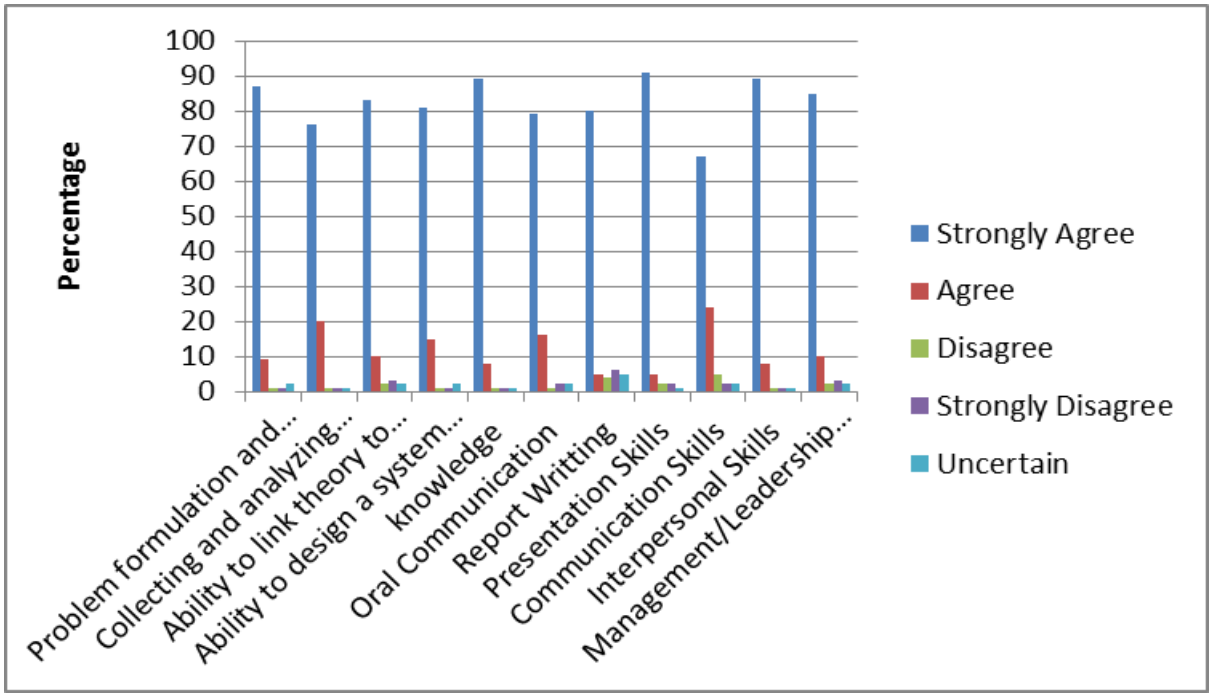
The data generated as a result of faculty survey, showed that 43% of faculty members were very satisfied , 32% satisfied, 12 uncertain, 03% dissatisfied and 10% very dissatisfied are satisfied with their job clarity about promotion process. However, most of the faculty themselves reported as very satisfied mentoring and administrative support, job security, support from the department, their progress through ranks. The least time availability to faculty to interact with their family is due to extra load on present teachers as some times of the faculty members proceed on training, workshops etc so the poor strength of remaining faculty in the campus has to bear out the load of course work and other assignments.



Proforma 7

Alumni Survey:

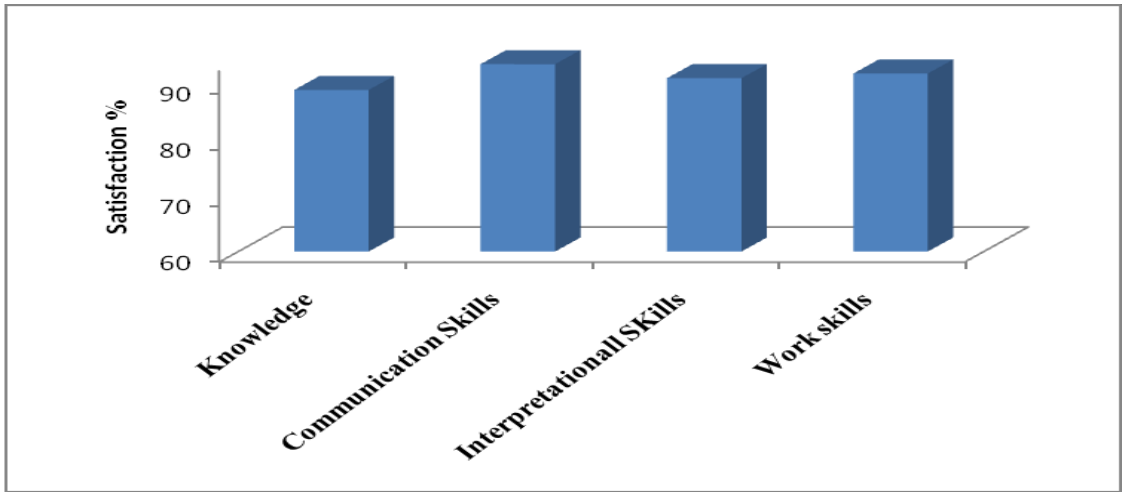
Results obtained from alumni survey showed that when the alumni were asked regarding the knowledge they obtained from this department, the overall response was very good. 81% of the alumni agreed that the problem formulation and solving skills were well acquainted with scientific knowledge. 75% of the students showed their agreement regarding collecting and analyzing appropritae data. Most strong positive response was given by alumni regarding ability to link theory to practice where 90% alumni showed agreement which means department was able to impart research skills in students. Regarding Oral Communication 79% alumni showed agreement. Alumni showed agreement towards communication skills by 80%. There was a lack in report writing as shown by agreement of 62% alumni and 10% uncertain.



Proforma 8

Employer Survey

Feedback about 21 employees was obtained from organizations viz. Pakistan Horticultural Authority, Khyber Pakhtoon Khaw Forest Department , NIGAB Research Institute-National Agriculture Research Centre Islamabad (NARC), Pir Mehr Ali Shah Arid Agriculture University Rawalpindi and Banks. Their views were keen observed and discussed in the department for future improvements. The major emphasis was to know the employers comments on the quality of education regarding: knowledge, communication skill, work skill and interpersonal skill these students have. Survey reflects that our graduates fall above average and in all areas, their abilities were rated above 80%. This indicates that our graduates are well adaptable and show their better potential in any given environment. However, some employers have given general comments about some weaknesses, particularly the practical workability. The point has been well noted and will be tried to overcome for our future and current students.



Employer survey for the determination of student's skill level

Standard 1-3: The results o f Program's assessment and the extent to which they are used to improve the program must be documented.

The results are being communicated to the respective departmental head through the Dean for corrective measures where needed.

Strength of the department

The main strength of the department is the availability of highly qualified teachers in variety of subjects such as crop physiology, fodder production, stress physiology, crop

nutrition, weed science, crop modeling etc. and their full acquaintance with respective subjects. Majority of the faculty members are foreign qualified and are well versed in their area of interest. Their work has been published in national and international Journals They have also implemented national research projects and are highly conscious of the problems to be taken by the postgraduate students.

Weakness Identified in the Program

Lack of infrastructure to transfer the recommended practices and technology to farmers. Access to latest literature and availability of updated review is not up to the mark. There is a need for short foreign trainings of young faculty members. Green-house facilities are also lacking. Lecture rooms, common rooms, post-graduate laboratories are also lacking.

Major Feature of Improvement Plans

Improve the quality of education in the Department of Horticulture through audio-visual means and the use of modern equipment as well as providing the latest literature, magazines, books, reviews and access to the Internet feature. Comprehensive enhance the knowledge and skills of faculty members with regard to the latest global developments in the discipline through exchange and training programs, short-term and cooperative research project inside and outside Pakistan.

General Comments

- Emphasis on practical work
- Improvement of communication skill, including writing and presentation
- Development of the habit of reading to up-date knowledge
- To inculcate the moral and ethical values

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

Skills and capabilities reflected in performance as Horticulturist

Special importance has been given on the practical work in the profession of horticulture to build confidence and communication skills effectively in writing, oral and

demonstration to use modern tools and techniques for their profession. Efforts also have been made to explicate and design the experiments/project and to work effectively in a team, to manage a crop problem and assimilate ability to recognize future needs.

Major future improvement plans

- An essential and distinguishing attribute of horticulture education through audio visual aids and modern tools along with provision of latest literature, journals, books, reviews and access to internet.
- Flourishing the facilities for horticulture crop improvement, hydroponics setup, germplasm units and develop extension material.

Strength and weaknesses of the department

Strength

The main strength of the department is the availability of highly qualified teachers including (8 PhDs), with good experience of their respective subjects, having vast knowledge of horticultural production and management systems and associated problems. Faculty members have local as well as foreign degrees (USA, UK, Turkey, China etc) and are experts in their area of specialization. Four faculty members got postdoctoral research experience from Australia, Italy and UK and China. Many faculty members have national research projects and are highly conscious of the problems to be taken by the post-graduate students. 2 professors, 1 Associate Professor, 4 Assistant Professor & 5 Lecturers specialized in their subjects are currently engaged in their academic and research activities.

Weaknesses

Advanced teaching and research is being handicapped due to lack of important equipments as hydroponics system including a fully equipped and the set of automated greenhouses and cold storage facilities for post-graduate students. To introduce the most economical protected horticulture, there is a dire need to establish the chain of greenhouse based on the Chinese energy saving technology (in progress). For the research to solve the problems in the area of post- harvest there is need for controlled atmosphere storage and multi-temperature storage chambers. In case of biotechnology, there is need for vector construction, electorporation and gene transformation equipment. Additionally, to ensure the production of pathogen-free plant material, a complete system of ELISA and other diagnostic

kits for detection and determination of plant pathogens. Areas for seed production of vegetables and ornamentals are not available. Lecture rooms, post-graduate laboratories and survey / offices for faculty members are also lacking. A landscape studio is indispensable to coup up the present needs of landscape horticulture. The is a need to have a computer with efficient internet access for every faculty member

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

Present students' enrolment

In the past, the enrolment was significantly less compared with the present status. The new trend is that the applicants give high preference to opt the horticulture as a major subject in the agriculture faculty as illustrated in the following table:

Table-3: Quantitative assessment of the department (during 2012-14)

Sr. #	Particular	No.	Remarks
I	Undergraduates (B.Sc. Hons) produced	61	90% of them joined and 10%did not continue their education.
	Students: Faculty rates	7:1	
	Average grade point	2.5	Fulfils HEC criteria

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

Performance for research activities

The faculty staff of Horticulture department is awfully engaged in teaching and research activities, consequently the findings are being published in reputed national and international journals along with the presentation of the findings of problem-oriented and solution-oriented research outcomes at different national and international forums. The following table shows some laudable performance in the form of publication:

Table- 4: Performance for research activities during the year 2012-14

Faculty	Journal Publications (National & International)	Conference Publications (Proceedings/ Abstract)	Projects
Dr. Nadeem Akhtar Abbasi	19	01	02
Dr. Ishfaq Ahmad Hafiz	07	--	01
Dr. Khalid Mahmood	4	1	-
Dr. Imran Hassan	--	--	--
Ms. Najma Yousaf Zahid	3	-	-
Dr. Shahid J. Butt			
Dr. M. Azam Khan	--	--	--
Mr. Umer Habib	1	--	-
Ms. Mehwish Yaseen	5	--	1
Dr. Touqeer Ahmad	02	--	--

The staff is well trained in horticultural crop production, post-harvest technology, biotechnology, protected cultivation, vegetable breeding, hydroponics/soilless crop production, floriculture, landscape horticulture, and many other specialized fields in horticulture.

Community services

- Holding of national and international conferences/workshops and training programme on horticulture for students, teachers and farming community
- Advisory services to the farmers, especially for Pothohar region.
- Knowledge dissemination for the promotion of greenhouse and tunnel technology in arid region.
- To guide the education institutes for improved landscaping.
- Guidance and supervision of students and interested people for the promotion of horticulture.
- Coordination and participation in different horticultural competitions (e.g. fruit, flower and vegetable shows).
- Supervision of students on internship in various organizations.

Departmental administrative services for faculty and students

- To achieve the task assigned by the competent authority.
- 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 per month. Board of studies of the department meets quarterly.
- Sharing the role in publishing the university magazine.
- Quick office disposal; no complaint pertaining to delay has ever received from authorities.
- Proper records of individuals' students, their theses etc. are maintained.

Criterion 2: CURRICULUM DESIGN AND ORGANIZATION

Degree Title: B.Sc.(Hons) Agri, Major Horticulture

All the courses for degree program were built up 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, ccurriculum for the Department of Horticulture is revised/updated through different bodies. At department level, Board of Studies, which constituted of senior faculty members, is responsible for updating the curriculum. This body is authorised to formulate syllabus and course content. The chairman of the Department is the convener of this body. The courses are then sent to the Board of Faculty for approval. The Dean of the Faculty, who is also the Convener, conducts meeting. As per university rules courses after the approval from the Faculty Board, are placed before the University Academic Council for their approval.

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 three degree programs are organized by the department.

B.Sc. (Hons) Agric. Majoring in Horticulture**:** The B.Sc. (Hons) degree program consists of 4 academic years/ 8 semesters.

Pre-requisites

Minimum academic requirements for B.Sc. Honours in Horticulture

A person retaining 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:

Matric	10%
Intermediate	50%
Entry test	40%

Degree Requirements:

As a whole a student has to study 140 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 Grade Point Average 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

Semester	CGPA
First	0.75
Second	1.00
Third	1.25
Fourth	1.50
Fifth	1.75
Sixth	2.00
Seven	2.25
Eight	2.50

Examination and Weightage:

a) Theory

In theory paper, student's evaluation is done by mid-term examination, assignments/quizzes/presentations 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 as prescribed here under:

Mid Examination 30%
Assignments plus others 10%
Final Examination 60%

b) 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-5: Scheme of studies for B. Sc. (Hons.) Agriculture (first semester)

Course No.	Course Title	Credit Hours
AGR-301	Basic Agriculture	3(2-2)
AEC-301	Principles of Agricultural Economics	3(3-0)
ENG-301	Functional English	3(3-0)
HORT-301	Introduction to Horticulture	3(2-2)
IS-301/ET-301	Islamic Studies/ Ethics	2(2-0)
MATH-301/ BIOL-301	Mathematics-I/ Biology-I	3(3-0) 3(2-2)
SS-301	Introduction to Soil Science	3(3-0)

Second semester

Course No.	Course Title	Credit Hours
AGR-302	Summer Crops	3(2-2)
ENG-302	Communication Skills	3(3-0)
FT-302	Introduction to Food Sciences Technology	2(2-0)
HORT-302	Principles of Horticultural Practices	2(1-2)
MATH-302/ BIOL-302	Mathematics-II/ Biology-II	3(3-0) 3(2-2)
FR-302	Introduction to Rangeland & Wildlife Management	3(2-2)
SS-302	Soil and Water Conservation	2(2-0)
SSH-302	Pakistan Studies	2(2-0)

Third semester

Course No.	Course Title	Credit Hours
AGR-401	Winter Crops	3(2-2)
AS-401	Animal Husbandry	3(2-2)
ENT-401	Introductory Entomology	2(1-2)
FT-401	Food Processing and Preservation	3(2-2)
IT-401	Introduction to Information Technology	3(1-4)

PBG-401	Introductory Genetics	2(1-2)
PP-401	Introduction to Plant Pathogens	2(1-2)
AE-401	Introduction to Agricultural Extension Education	2(1-2)

Fourth semester

Course No.	Course Title	Credit Hours
AGR-402	Field Crop Physiology	3(2-2)
ENT-402	Applied Entomology	3(2-2)
FR-402	Introduction to Forestry and Watershed Management	3(3-0
AS-402	Poultry Husbandry	2(1-2)
PBG-402	Introductory Plant Breeding	3(2-2)
PP-402	Introduction to Plant Pathology	3(2-2)
STAT-402	Introduction to Statistics	3(3-0)

Fifth semester

Course No.	Course Title	Credit Hours
General Courses		
AEN-501	Farm Mechanization	2(1-2)
AGRO-501	Arid Zone Agriculture	2(2-0)
Major Courses		
Hort- 501	Winter Vegetables	3(2-2)
Hort-503	Medicinal and aromatic Plants	3(2-2)
Hort-505	Production of Tropical & Sub-tropical Fruits	3(2-2)
Hort-507	Physiology of Horticultural Plants	3(2-2)

Sixth semester

Course No.	Course Title	Credit Hours
General Courses		
AEN-502	Conservation Engineering and Water Resources Development	2(1-2)

SS-508	Instrumentation and Laboratory Techniques	2(0-4)
Major Courses		
Hort-502	Summer Vegetables	3(2-2)
Hort-504	Temperate Fruits Productions	3(2-2)
Hort-506	Pre and post harvest Technology of Horticultural crops	3(2-2)
Hort-508	Landscape Plants	3(2-2)
Hort-510	Arid Zone Horticulture	2(1-2)

Seventh semester

Course No.	Course Title	Credit Hours
General Courses		
STAT-601	Experimental Designs	2(1-2)
SOC-601	Rural and Pastoral Sociology	
MGT-601	Introduction to Agri. Business Management	2(2-0)
Major Courses		
Hort-601	Commercial Flower Production	3(2-2)
Hort-603	Certified Seed and Nursery Production of Horticultural Crops	3(2-2)
Hort-605	Forcing of High Value Crops	3(2-2)
Hort-607	Breeding of Vegetable Crops	3(2-2)
Hort-609	Project Planning and Scientific Writing	2(1-2)
Hort-611	In Vitro Propagation of Horticultural Crops	2(1-2)

Eighth semester

Course No.	Course Title	Credit Hours
Hort-611	**Internship including Report writing and Presentation**	**15(0-30)**

<u>Standard 2-1:</u> The curriculum must be consistent and supports the program's documented objectives.

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

Table-6: Courses *vs* program outcomes

Course/ Groups of Course	Outcomes			
	1	**2**	**3**	**4**
Hort-604, Hort-605, Hort-607	XX	XX	XX	X
Hort-603	XXX	XX	X	X
Hort-301, Hort-302 Hort-601	X	XX	XX	X
Hort-505, Hort-602	XXX	X	XX	X
Hort-501, Hort-504	XX	X	XXX	X
Hort-604	XX	XX	XX	XX
Hort-503	XX	XX	XX	X
Hort-507	XXX	X	XX	XX
Hort-508	XX	XX	X	X
Hort-506	XXX	XX	XX	X

X: relevant

XX: relevant and satisfactory

XXX: very relevant and satisfactory

- The curriculum fits very well and satisfies the core requirements for the program, as specified the respective accreditation body.
- The curriculum satisfied the general arts and professional and other discipline required for the program according to demands and requirements set by HEC.

<u>Standard 2-2:</u> Theoretical background, problem analysis and solution design must be stressed within the problem core material.

The meeting standard of this clause is tabulated in the following:

Table-7: Standard 2-2 requirement (percentage of elements in courses)

Elements	**Courses**
Theoretical backgrounds	Hort-301, Hort-302, Hort-501, Hort-503, Hort-504, Hort-505, Hort-603, Hort-604
Problem analysis	Hort-507, Hort-602, Hort-607, Hort-506
Solution design	Hort-508, , Hort-601

Standard 2-3 to standard 2-5

The above cited standards have already been justified in table 8.

Standard 2-6: Information Technology Component of the Curriculum must be developed and applied in 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:

- Computer, I.T. and statistics courses 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 2-7: Oral and written communication skills of the student must be developed and applied in the program.

- A course of 2 credit hours developing communication skills has been integrated in the curriculum of B.Sc. (Hons) level.
- Assignments are given to BSC (Hons) 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.

Criterion 3: LABORATORIES AND COMPUTING FACILITIES

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

- Laboratory Title: 1. Tissue Culture Laboratory I,
  2. Tissue Culture Laboratory II
  3. Horticulture Analytical Laboratory
  4. Horticulture Analytical Post harvest laboratory.
- Location and Area: Faculty of Agriculture and Food Sciences, A-Block, 1st Floor and ground floor, Main Campus
- Objectives: Laboratories are used for: Practical exercise and demonstrations to graduate students in their

introductory and major courses. Research work for the graduate.

- Shortcoming: The number of labs is not sufficient. The standard requirements in view of operation and quality, available resources and expansion programs are vitally required. Major apparatus viz. equipment: along with necessary chemicals are needed. Teachers usually arrange the lecture material and helping literature at their own expense. Some manuals/broachers are being prepared by the academic staff.
- Safety Regulations: Safety measures are not available against fire (Extinguishers), minor hazards and accidents, injuries (First Aid Kit). However, the University maintains a Medical Dispensary for such incidents where the required apparatus is insufficient.

Standard 3-1: Laboratory Manuals/ documentation/instructions experiments must be available and readily accessible to faculty and students.

Laboratory manuals (tissue culture lab, horticulture manuals etc) are available. The department library has the collection of books but still a number of books are required.

Standard 3-2: There must be adequate support personnel for instruction and maintaining laboratories

There is shortage of laboratory assistants and laboratory attendants and are direly needed to maintain laboratory, equipment, glassware, chemicals, material etc.

Standard 3-3: The University computing infrastructure and facilities must adequate to support program's objectives.

- **Computing facilities support*:*** Not available to all students.
- **Shortcoming in computing infrastructure:** Computers with internet facilities should be available to all students.
- **Safety Arrangements:** There are no proper safety arrangements and no security plan is available in case of emergency. The department is located on the 2nd floor; there are no emergency exits for the labs. No fire extinguishers have been installed in any laboratory or in the offices. No first aid kits/facilities provided in the laboratories/department.

Criterion 4: STUDENT SUPPORT AND ADVISING

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

Standard 4-1: Courses must be offered with sufficient frequency and number for students to complete the program in a timely manner.

- 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.
- Elective courses are offered as per policy of HEC and the University.

Standard 4-2: Courses in the major area of study must be structured to ensure effective interaction between students, faculty and teaching assistants.

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

- Courses are developed 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 on how to complete the program must be available to all students and access to academic advising must be available to make course decisions and career choices.

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

- Students are informed about the program requirement through the office of the head of the department.
- Through the personal communication of the teachers with the students.
- Monthly meetings are organized by the head of the department for counseling of the students. In addition, students can also contact with the relevant teachers whenever they face any problem.
- It is necessary for the students to participate in the monthly meeting.
- In case of some problem Director Student Affairs appointed by the university, helps the students. Tutorial System in all departments has been efficiently working. Tow period on Thursday are reserved for students for extracurricular activities. However, there is no such counseling Cell in the department.
- Student can interact with the teachers/scientist in universities or research organization whenever they needed and there is an open option for the students to get the membership in the professional societies like National Rose Society Islamabad, Horticultural Society of Pakistan, National Horticulture Society, Pakistan Horticulture Society, Pakistan Botanical Society and other relevant professional societies.

Criterion 5: PROCESS CONTROL

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

<u>Standard 5-1:</u> The process by which students are admitted to the program must be based on quantitative and qualitative criteria and clearly documented. This process must be periodically evaluated to ensure that it is meeting its objectives.

- The process of admission is well established and followed as per rules and criteria set by HEC. For this purpose an advertisement is published in the National News Papers by the Registrar Office.
- Admission criteria for B.Sc. (Hons) Agri. F.Sc. pre medical and pre engineering and entry test.

<u>Standard 5-2:</u> The process by which students are registered in the program and monitoring of students progress to ensure timely completion of the program must be documented This process must be periodically evaluated to ensure that it is meeting its objectives.

- The student name, after completion of the admission process, is forwarded to the Registrar Office for proper registration in the specific program and the registration number is issued to the student.
- After the 4th semester students are allotted different majors (e.g. Horticulture, in our case) by the Dean Faculty of Crop and Food Sciences.
- Students are evaluated through Mid, Final and Practical exams and through Assignments.
- Registration is done for one time for each degree but evaluation is done through the result of each semester. Only those students who fulfill the criteria of the University, they are promoted to the next semester.
- In general, the students are registered on competition bases keeping in view the academic and research standards.

<u>Standard 5-3:</u> The process of recruiting and retaining highly qualified faculty members must be in place and clearly documented. Also processes and procedures for faculty evaluation, promotion must be consistent with institution mission statement. These processes must be periodically evaluated to ensure that it is meeting with its objectives.

- Vacant and newly created positions are advertised in the national newspapers, applications are received by the Registrar office, and call letters are issued to the

short-listed candidates on the basis of experience, qualification, publications and other qualities/activities as determined by the University.

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

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

- To provide high quality teaching, department periodically revises the curriculum depending upon requirements, innovations and new technology.
- With the emergence of new fields, new courses are introduced, and included in the curriculum.
- The easily available books in the University library are provided to the students for the preparation of different courses. Additionally, copying and internet facilities are also available to the students.
- Notes are also prepared by the teachers and given to the students other than different handouts
- Most of the lectures are supplemented by overheads, slides and pictures.
- All efforts are made that the courses and knowledge imparted meet the objectives and outcome. The progress is regularly reviewed in the staff meetings.

<u>Standard 5-5:</u> The process that ensures that graduates have completed the requirements of the program must be based on standards, effective and clearly

documented procedures. This process must be periodically evaluated to ensure that it is meeting its objectives.

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

Mid Examination	30%
Assignments	10%
Final Examination	60%

- Grade points are as follows

Marks obtained	Grade	Grade point	Remarks
80-100 %	A	4	Excellent
65-79 %	B	3	Good
50-64 %	C	2	Satisfactory
40-49 %	D	1	Pass
Below 40 %	F	0	Fail

- 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.

Criterion 6: FACULTY

Standard 6-1: There must be enough full time faculties 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.

Table-8: Faculty distribution by program areas in Horticulture

Program area of specialization	Courses in the area and average number of sections per year	Number of faculty members in each area	Number of faculty with Ph.D. degree
Post-harvest	2	1	1
Tissue Culture	2	2	1
Protected Cultivation	2	2	1
Floriculture	2	2	1
Landscape Horticulture	1	1	-
Fruit crops	3	2	2

<u>Standard 6-2:</u> 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.
- Currently two faculty members are abroad on study leave for doctoral degree as sponsored by the different organizations.
- 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 facility with latest books is also available.
- Effective programs for faculty development have been just introduced since the last semester.

<u>Standard 6-3:</u> All faculty members should be motivated and have job satisfaction to excel in their profession

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

Faculty survey

The results of faculty survey were summarized in the form of bar chart quoted in the previous pages.

Survey of graduating students

The graduating students in last semester were surveyed as per Performa 3 before the award of degree. The results of graduating students were summarized in the form of bar charts in the previous pages.

Criterion 7: INSTITUTIONAL FACILITIES

The university administration has been struggling hard to strengthen all the departments and up-gradation of departments and establishing new faculties and Institutes. The university is also trying to attract highly qualified faculty. Following needs to focus on:

- The institution must have the infrastructure to support new trends in learning such as e-learning including digital publications, journals etc.
- The library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personnel. In- sufficient library's technical collection of books. Recommended books, relevant journals of the programs are not available to the students and to the teachers as well.
- These aspects need to be strengthened in number and space.
- Class rooms must be adequately equipped, especially the multimedia facility and offices must be adequate to enable faculty to carry out their responsibilities**.** In horticulture, offices for faculty staff are not available, thus they are accommodated minimum two/room, and in spite the rooms are quite narrow in space, subsequently affecting the quality performance.

<u>Standard 7-1:</u> The institution must have the infrastructure to support new trends in learning such as e-learning

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

- Majority of the faculty members do not have access to the PCs. Computers are not provided by the university.
- The internet services provided by the university are poor. The speed of internet is slow and often internet does not work. The telephones are also connected with the internet and the services are often breached.

- Breach of power intermittently, due to which research and academic work both are suffered.
- Majority of equipments is either out of order or outdated.
- Latest and modern molecular equipments or apparatus are lacking.
- Untrained supporting staff.
- Faculties lack practical knowledge of modern and molecular techniques.
- Scanty budget for consumables.
- Fans and tube lights are out of order and are not properly and timely repaired.

Standard 7-2: The library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personnel.

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

Standard 7-3: Class-Rooms must be adequately equipped and offices must be adequate to enable faculty to carry out their responsibilities.

Currently the class rooms are not enough and the space is not only limited but also some basic facilities are lacking. Multimedia are not available for the lecture halls. Practical lab space is also lacking. This affects the quality of teaching. The faculty offices are another serious problem of the department. Some faculty members are sharing small rooms and the other are having their desks in the laboratories.

Criterion 8: INSTITUTIONAL SUPPORT

The following are mentioned against this criterion:

- Due to unavailability of class rooms, classes are taken in the laboratories. Therefore, it is imperative to arrange more classes for quality teaching.
- As mentioned earlier, faculty offices are inadequate and therefore two or three teachers have one office room.
- Space limitation is the major constraint in the development and strengthening of discipline.

- There must be sufficient support and financial resources to attract and retain high quality faculty and provide the means for them to maintain competence as teachers and scholars.
- The experienced teachers are not provided the house accommodation by the university and are living in the rented houses with exorbitant rent within the source of mere salary, thus become difficult to concentrate on the efficient working. Therefore house accommodation is indispensably required for the department staff.
- Insufficient secretarial support, technical staff and office equipment.
- Staff attendant/s not available.

<u>Standard 8-1:</u> There must be sufficient support and financial resources to attract and retain high quality faculty and provide the means for them to maintain competence as teachers and scholars.

- At present department is not having sufficient financial resource to maintain the present needs of the department. Individual research grants for students and faculty are mainly supporting the departmental research activities. Due to lack of proper facilities like fruit orchard the students conduct their research at different areas. There is a dire need for increasing the financial resources allocated to the department to establish a library, laboratories and computer facilities. Horticulture department has submitted a project for strengthening of department and it is hoped to be funded during the next year. Suggestions and factors that can contribute to the motivation of the faculty are given as follows:
- Research grants for young faculty members may be allocated.
- Trainings should be arranged in abroad to train the faculty members.

<u>Standard 8-2:</u> There must be an adequate number of high quality graduate students.

The intake of B.Sc. (Hons) and M.Sc. (Hons) students is once in a year. A detail of the Students enrolled during the past seven years is given in the following Table.

Table-9: Enrollment in different programs from 2006-2014

Discipline	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**
B.Sc. (Hons)	14	11	17	19	21	22	26	28

<u>Standard 8-3:</u> Financial resources must be provided to acquire and maintain Library holdings, laboratories and computing facilities.

Total budget of the department for the financial year 2012-14 is **Rs 8,10,000** which hardly fulfill the departmental needs particularly for the purchase of contingency items. Limited resources are provided from the university budget. The computing facilities were provided on limited basis from the approved HEC project of Horticulture department, where more facilities for library, laboratories and computers are suggested for quality improvement of the department.

Executive Summary

Horticulture is a diverse profession that encompasses all aspects of crop production, propagation and plant protection. The Department is leading in the areas of fruits, vegetables and flowers. The department started its B.Sc. (Hons.) degree program in 1986. The Department has well-structured academic program of B.Sc. (Hons) Agriculture. The courses aim to develop and strengthen student's capacity to grasp principles and practices of horticulture based on scientific principles. Horticulture graduates have key understanding of the modern concepts of crop management, nursery raising and vegetable seed production. In addition they have sufficient specialist knowledge in selected areas to allow them to pursue a research degree in crop science. Graduates acquire scientific background as well as having gained experience in problem solving and have developed the communication, numerical and computer skills required for a wide range of careers. In order to assess whether department is fulfilling its objectives or not, surveys on various aspects such as course evaluation, teacher evaluation, alumni survey, graduating students surveys and faculty survey etc. have been conducted by the departmental members of the program team. The data revealed that students are satisfied with the subject approach of faculty members, their fairness in examination, and level of knowledge. However, the limited availability of lecture rooms and poor laboratories infrastructure were reported as major hurdles.

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Annex-XI

DETAILED COURSE CONTENTS OF SCHEME OF STUDIES FOR B.Sc (Hons) AGRICULTURE MAJORING HORTICULTURE

HORT-301 INTRODUCTION TO HORTICULTURE 3(2-2)

THEORY

Introduction, history, importance and future scope, Definition and divisions of horticulture, Classification of horticultural crops, Plant parts, their modifications and functions, plant environment; climate (temperature, light, humidity etc.) and soil (structure, texture, fertility etc), propagation of Horticultural plants, Concept of tissue culture.

PRACTICAL:

Visit of experimental gardens and nurseries with general identification of important horticultural plants, Garden tools and their uses, Techniques of propagation, Visit of tissue culture laboratory.

Books Recommended:

1. Janick, J. 1979. Horticulture Science. W.H. Freeman and Co., San Francisco.
2. Malik, M.N. 1994. Horticulture. National Book Foundations, Islamabad.
3. Edmond, J.B., T.L. Senn, F.S. Andrews and R.G. Halfacre. 1977. Fundamentals of Hortifcuture. Tata McGraw Hill Publishing Co., New Delhi.
4. Reliey, H. E., C. L. Shry (Jr). 2002. Introductory Horticulture (6^{th} Ed.) Thompson Learning Inc., Delmar, USA.

HORT-302 PRINCIPLES OF HORTICULTURAL PRACTICES 2(1-2)

Theory:

Establishment of gardens; site selection, layout methods, wind breaks; Management practices; irrigation, fertilizers and manures, training and pruning, cultivation and weed control; Plant protection measures and sanitation. Basic principles involved in harvest and post harvest handling; Establishment and maintenance of lawns, Concept of protected horticulture.

PRACTICAL:

Practice in layout methods, Selection of plants from nursery; Planting, after care, hoeing and weeding etc. identification and nomenclature of important fruits, vegetables and ornamental plants; Planting and maintenance of lawns, visit of plant growing structures and storages.

Books Recommended:

1. George A., 1999. Horticulture Principles and Practices. Simon & Schuster/ A Viacom Company, New Jersey, USA.
2. Laurie A., / Victor H. Ries. 2004. Floriculture Fundamentals and Practices. Agrobios India.
3. Ali, N., M.N. Malik and A.H. Gilani. 1979. Practical Manual for Fruit culture. Univ. of Agri., Press, Faisalabad.
4. Edmond, J.B., T.L. Senn, F.S. Andrews and R.G. Halfacre. 1977. Fundamentals of Horticulture. Tata McGraw Hill Publishing Co., New Delhi.
5. Malik, M.N. 1994. Horticulture. National Book Foundation, Islamabad.

HORT-401 INTRODUCTION TO HORTICULTURE 3(2-2)

THEORY

Importance of horticulture and its branches, Definition and explanation of horticultural terminologies, classification of horticultural plants with special references to arid zone. Principles of site selection plat nurseries. Raising of plants and nurseries for flowers, fruits, and vegetables and their maintenance. Layout systems, preparation of soil / field seedling transplanting in orchards. After care of plants and cultural practices in arid areas.

PRACTICAL

Identification of horticultural plants, field practices and maintenance of horticultural plants. Visit of nurseries and fruits orchards.

Books Recommended

1. Janick, J. (1979). Horticultural Sciences W. H. Freeman and Co. San Francico. USA.
2. Malik, M. 1994. Horticulture. National Books Foundation, Islamabad.
3. Purseglove, J.W. 1972. Tropical crops. (1) Monocotyledons (ii) Dicotyledon Longman Group Limited, London.

HORT-402 PROPAGATION OF HORTICULTURAL PLANTS 3(2-2)

THEORY

Sexual and asexual propagation and their importance, Seed and bud wood dormancy, its causes and controls. Various techniques of asexual propagation with special emphasis on grafting, budding and layering methods. Protective propagation. Commercial nurseries and their managements.

Practical

Seed dormancy test. Field practice in selected asexual propagation techniques such as grafting, budding and layering. Visits to commercial nurseries.

Books Recommended

1. Bose, T. K, S. K. Mitra and M. K. Sadhu (1986). Propagation of Tropical and Subtropical Horticultural Crops. Naya Prokash, Calcutta.
2. Davidson, II, and R. Meeklenburg (1981). Nursery Management. Administration and culture. Prentice Hall International Inc., New Jersy
3. Hartmann, H. T., D. E. Kester, F. T. Davis and R. L. Geneve (1997). Plant propagation principles and practices (6^{th} Ed.). Prentice-Hall International Inc., New Jersey
4. Malik, M. N. 1994. Horticulture, National Book Foundation, Islamabad.

HORT-501 PRINCIPLES OF FRUIT PRODUCTION 3(2-2)

THEORY

Introduction to fruit science, fruit bud formation, development, along with their controlling factors, pollination and fruit setting problems, Mutations and bud variations. Parthenocarpy and seedlessness. Biennial bearing. Techniques to improve / select fruit strains for arid areas of Pakistan. Basic Principles involved in harvesting, grading, packing, transportation. Storage and marketing of fruits. Fruits marketing system in Pakistan and its scope for improvement.

PRACTICAL

Identification of fruit plants, pruning and training of important fruit trees. Study of fruits. Fruits bearing habit. Market survey for the study of fruits damage and their control.

BOOKS RECOMMENDED

1. Gardner, V. R. (1966). Principles of Horticultural production. Michigan State University Press, Michigan, U.S.A.
2. Halfacre, R. B. and J. A. Barden. (1979). Horticulture. The McGraw Hill Book Company New Yord.
3. Malik, M. N. 1994. Horticulture. National Book Foundation, Islamabad.
4. Purseglove, J. W. 1972. Tropical Crops (I) Monocotyledons (ii) Dicotyledon Longman Group London.
5. Ryugo, K. 1988. Fruits culture-its science and art. John Wiley and Sons Inc., New Yord.
6. Westwood, M. N. (1978). Temprate Zone Pomology. W. H. Freeman & Company, San Francisco.

HORT-503 WINTER VGETABLES 3(2-2)

THEORY

Classification of winter vegetables. Climate/ soil requirements, cultural practices, harvesting, grading, transportation, storage, marketing. Production cost of winter vegetables. Description of important varieties of winter vegetables including tuber and bulbous crops. Basic concepts on vegetable breeding.

PRACTICAL

Identification of winter vegetables and seeds, their sowing and maintenance in the field. Visits of different vegetable farms. Vegetables floral studies.

BOOKS RECOMMENDED

1. Malik, M. N. 1994. Horticulture. National Book Foundation, Ibd.
2. Perice, Lincoln C. 1987. Vegetables, Characteristics, Production and Marketing. John Willey and Sons, Inc., NewYork.
3. Tindall, H. D. 1986. Vegetables In The Tropics. Mac Millan Edu. Ltd. Hampshire, R G 212xS.
4. Thompson, H. C. and W. C. Kelly. 1957. Vegetable Crops. Mac Graw Hill Stock Co., NewYork.
5. Ware, George W. and Mecollum, J. P. 1980. Vegetable Crops Interstate. Printers Pub. Inc., Illions.

HORT-505 ORNAMENTAL HORTICULTURE 3(2-2)

THEORY

Importance, present status and future scope; Growing of annual, perennials, Cacti, succulents and flowering bulbs: their propagation and maintenance; classification of ornamentals trees, Palms, shrubs, climbers and turf grasses: their propagation, growth requirements, and their suitability for various purposes and locations.

PRACTICAL

Raising and transplanting of seasonal flowers; identification of annuals, perennials, cacti, succulents, flowers bulbs, trees, shrubs, palms, climbers and their propagation methods.

BOOKS RECOMMENDED

1. Arora, J. S. (1992). Introductory Ornamental Horticulture. Kalyani Publishers, New Dehli, Ludhinana, India.
2. Chada, K. L and B. Chaudhary (1986). Ornamental Horticulture in India. Indian council of Agricultural Research, New Dheli.
3. Carpenter, P.L., T. D. Walker and F. A. Lanphear (1975). Plants in the Landscape. W. h. Freeman and Co., San Francisco.
4. Flener, W., (1965). Shade and Ornamental Trees in colour. Grosset and Dunlop Inc. Publishers, New York.
5. Helber, A. (1981). Ornamental Garden shrubs. The Hamlyn Publishing Group Ltd., London.
6. Larson, R.A. (1980). Introduction to floriculture. Academic Press, New York.
7. Laurie, A., and V. H. Ries (1950). Floriculture: fundamental and Practice. McGraw Hill, New York.
8. Mcdaniel, G. L. (1982). Ornamental Horticulture, (2nd Ed.). Reston Publishing Co., Reston. Virginia.

HORT-506

HARVEST AND POST HARVEST TECHNOLOGY OF HORTICULTURAL CROPS 3(2-2)

THEORY

Introduction and importance; Indices of fruit maturity/ripening of important horticultural plants; Climacteric and non-climacteric commodities; Harvesting and curing/ripening of different fruits; Packing house operations (culling, grading, washing, cleaning, coloring, waxing and packing of important fruits, vegetables and flowers); Packing materials and containers; Storage (Principles and types, factors affecting shelf life of fruits, vegetables and flowers); Shipment of fruits, vegetables and flowers for local and foreign markets.

PRACTICAL

Determination of harvest indices; Practices in harvesting, grading, curing and packing techniques; Machinery and equipments used for various operations; Visits to the fruit, vegetable and floral markets, packing houses and cold storages etc.

BOOKS RECOMMENDED

1. Heard, N. F., and D.K. Salunkhe (1975). Post harvest Biology and Handling of Fruits and Vegetables. The AVI pub. Company Inc., Connecticut.
2. Kader, A.A. (1992). Post harvest Technology of Horticultural Crops. University of California, Division of Agriculture and Natural Resources.
3. Mitra, S.K. (1997). Post harvest Physiology and Storage of Tropical and Sub tropical Fruits. CAB International, Wallingford, U.K.
4. O' Breen, M, B.F. Garill and R.B. Findlay (1983). Principles and Practices for harvesting of Fruits and Nuts. AVI pub Co. Inc., Westport, Connecticut.
5. Tnompson, A.K. (1996). Post-harvest Technology of Fruits and Vegetables. Blackwell Science Ltd., Oxford.
6. Wills, R. B. H., T. H. Lee, D. Graham, W. B. McGlasson and E. G. Hall (1989). Post- Harvest (3rd Ed.). BSP Professional Books, Oxford.

HORT-507 PRODUCTION OF TROPICAL AND SUB-TROPICAL FRUITS

3(2-2)

THEORY

Cultivation of individual fruits with special reference to Botany, Climate, Soil Propagation, root stock, cultural practices, maturity, ripening, harvesting production of fruits such as mango, Banana, Date Palm, Ber, Jamman, Olive, Litchi, Cashew nut etc.

PRACTICAL

Identification and Botanical description of available tropical, subtropical fruits, inflorescence and fruits. Visit to different fruits orchards.

BOOKS RECOMMENDED

1. Ball, J. S. (1997). Fruit Browing, Kalyani Publishers, Ludbiane, India.
2. Malik, M. N. 1994. Horticulture, National Book Foundation, Islamabad
3. Nagy, S., and Shaw P. E., 1980. Tropical and Subtropical fruits. The AVI publishing company Inc. West Port Connecticut.
4. Popenoe, W. 1974. Manual of Tropical and Subtropical Fruits. Hafner Press New York.
5. Sawson, J.A. (1986). Tropical fruits. Longman Scientific and Technical, Harlow, Essex. U.K.
6. Showmaker, J. S. 1978. Small Fruit culture. The AVI publishing company Inc.

HORT-508 INDOOR HOUSE PLANT 3(2-2)

THEORY

Introduction and importance of indoor plants. The indoor environment: light, temperature, humidity, Cultural requirements; production of flower and foliage plants for shade and semi shade; Growing medium, moisture and aeration ; essential nutrient elements and fertilizer; Propagation; watering pests and diseases; acclimatization; Culture of important indoor and house plants.

PRACTICAL

Field trips; Identification of indoor plant; practice in watering and fertilization; Preparation of soil mixtures; Potting and repotting; propagation; Diagnosis of problems and treatments.

Books Recommended

1. Davidson, W. (1991). House plant. Tiger Books International, London.
2. Herwing, R. (1985). The Hamlyn Dictionary of House and Garden plants. The Humlyn Publishing Group Ltd. England.
3. Manaker, G.H. (1981). Interior plant Scape Installation: Maintenance & Mangmant Prentice Hall Inc., New Jersey.
4. Pyenson, L.L.P. (1981). Plant Health Handbook. A Guide to Better Gardening Indoor and Outdoors Avi Publications, West Port, Connecticut.
5. Rice, L.W. and R. P. Rice (1986). Practical Horticulture a Guide to Growing Indoor and out door plants. Prentice-Hall, New Jersey.
6. Schjenk, G. (1984). The complete Shed Gardeners. Houghton Miffin and Co., Boston.

HORT. 601 COMMERCIAL FLOWR PRODUCTIONS 4(3-2)

THEORY

Introduction; Present Status and future scope; Environmental factors influencing plant growth; Soils: soil preparation, manures and fertilizers; propagation, harvesting, packing and storage of the following (1) Major cut flower crops: Carnation, Chrysanthemum, Roses, Snapdragon, Orchids etc., (2) Miscellaneous cut flower cropws' marigold Jasminum Sambac (Motia), Aster, Calendula, Oerbea, Nomesia, Pausy, Stock, sweet Peas, Zinnia, (3) Bulbls: Amaryllis, Anemonel Freesia, Gladiolus, Hyacith, Iris, Ltlltum, Narcisus, Tulip, Tuberose etc.

PRACTICAL

Identification, Nursery raising, planting and cultural operation, Harvesting and Packing of important flowers.

BOOKS RECOMMENDED

1. Bose, T. K. and L. P. Yadva (1989). Commercial Flowers. Naya Prokash, Calcutta, Indian.
2. Chadha, K., I. And B. Choudhary (1986). Ornamental Horticultural in India. Indian council of Agricultural Research New Dehli.
3. Larson, R. A. (1980). Introduction to Floriculture. Academic Press, New York.
4. Randhawa, G. S. and A. Mukhopadhay (1986). Floriculture in India. Applied Publishers Private Limited New Dehli.
5. salinger, J. P. (1985). Commercial Flower Growing. Butterworth, Horticultural Book.
6. Yadav, I. S. and M. L. Choudhary (1997). Progressive Floriculture- Production Technologies of Important Commercial Flower Crops. The House of Sarpan, Banglore.

HORT- 603 CERTIFIED SEED PRODUCTION OF HORTICULTURAL CROPS 3(2-2)

THEORY

Importance of seed production. Seed germination and its controlling factors in arid areas. Cultivation. harvesting, extraction, drying, cleaning processing, storage and marketing of certified seeds of Root, bulk, fruit and leafy vegetables; various flowers and important fruits of and areas.

PRACTICAL

Seed identification, germination tests. Selling and Crossing Techniques in horticultural crops extraction, drying and storage of seeds.

BOOKS RECOMMENDED

1. Agrowal, R. M. 1980. Seed Technology. Oxford and IBH Publishing company, New Dehli Bombay
2. George Raymond, A. T. 1985. Vegetable Seed Production: Longman Group New York, London.
3. Robert, E. H. 1974. Viability of Seeds. Chapman and Hall Ltd. London.
4. Thompson, J. R. 1979. An Introduction to Seed Technology. John Wiley and sons. New York, Toronto.

HORT- 605 USES OF GROWTH REGULATORS IN HORTICULTURAL CROPS

3(3-0)

THEORY

Classification, importance, mode of action of growth regulators, their uses in various physiological functions of the plants such as seed dormancy, rooting and plant growth, flowering, fruit set and parthenocarpacy, fruit thinning, fruit maturity, fruit ripening, senescence and plants resistance in relation to uses of growth regulators.

BOOKS RECOMMENDED

1. Delvin, R. M. and F. M. Witman (1983). Plant Pathology Willard Grants Press, Boston.
2. F. B. Salisbury & C. W. Ross (1985). Plant Physiology (2nd Ed.). Wadsworth Publishing Company. Inc.
3. Nickell, L. g. (1982). Plant Growth Regulators (Agri. Uses). Springer Verlagj, Berlin, Heidelberg, New York.
4. Wareing, P. F. and 1. D. J. Philips (1981). Growth and Differentiation Plants. Pergamon Press, New York
6. Weaver, R. V. 1992, Plant Growth Substance in Agricultures. W. H. Freeman Co. San Francisco.

Annex- XII

FACULTY

The brief summary of CV's regarding all faculty staff is given below, where as detail of each faculty member is given in the proceeding paragraphs:

Name	Position	Qualification	Specialization
Dr. Nadeem Akhtar Abbasi	Professor	Ph. D	Pre and Post-harvest physiology of horticulture crops
Dr. Ishfaq Ahmed Hafiz	Professor	Ph. D	1. Protected Vegetable Farming 2. In-Vitro propagation of Horticultural Crops 3. Certified Seed and Nursery Production of Horticultural Crops
Dr. Khalid Mahmood Qureshi	Associate Professor	Ph. D	1. Arid Zone Horticulture
Dr. Imran Hassan	Assistant Professor	Ph.D	1. Introductory Horticulture 2. Commercial Flower Production 3. Horticultural Crop Production
Ms. Najma Yousaf Zahid	Assistant Professor	M. Sc. (Hons)	1. Production of Tropical & Sub-tropical Fruits 2. Medicinal and Aromatic Plants
Dr. Shahid J. Butt	Assistant Professor	Ph.D	1. Winter Vegetables 2. Temperate Fruit Production
Dr. Muhammad Azam Khan	Assistant Professor	Ph.D	Protected Vegetable Farming
Mr. Umer Habib	Lecturer	M. Sc. (Hons)	Ornamental Horticulture
Ms. Mehwish Yaseen	Lecturer	M. Sc. (Hons)	Physiology of Horticultural Plants
Dr. Touqeer Ahmad	Lecturer	Ph. D	Biotechnology/tissue culture of horticulture

Faculty Resume

Name	**Nadeem Akhtar Abbasi**
Personal	**Father's Name** : Muhammad Akhtar Abbasi **Date of Birth** : 03-03-1965 **N.I.C. NO.** : 61101-1748794-1 **Nationality** : Pakistani **Postal Address** : University of Arid Agriculture, Murree Road Rawalpindi. **Permanent Address** : Village Phulgran (Korang Valley) Distt. Islamabad, Pakistan. **Phone** : +92-51-9290771; 0300-5069600 **Email** : nadeemabbasi65@yahoo.com nadeem.abbasi@uaar.edu.pk
Experience	**Assistant Research Officer (Horticulture)** : Hill Fruit Research Station Murree under Ayyub Agriculture Research Institute, Faisalabad. Govt. of the Punjab from January 6, 1990 to December 1, 1999. **Duties Performed:** ☞ Training Farmers/students ☞ Management of Fruit/Nursery farms. ☞ Report Writing. ☞ Conducting research work on different fruit plants to solve farmers' problems. **Additional Duties Performed under Chief Minister of the Punjab Project for Beautification of Murree 1997 to 1999:** ☞ Planning and Execution of landscape projects to beautify Murree city. ☞ Management of the floriculture farm/nursery. ☞ Training farmers/students in the area of floriculture. ☞ Conducting research work on ornamental plants to determine the suitability for different areas of Murree. **Assistant professor:** Department of Horticulture, University of Arid Agriculture, Rawalpindi, Pakistan, from 01-12-1999 to 2-12-2002. **Associate Professor:** Department of Horticulture, University of Arid Agriculture, Rawalpindi, Pakistan, from 02-12-2002 to 02-08-06. **Professor:** Department of Horticulture, University of Arid Agriculture, Rawalpindi, Pakistan, from 02-08-2006 to date. **Responsibilities:** ☞ Responsible for organising teaching and research programs in the department. ☞ Active participation in teaching of various courses on fruits,

	vegetables, and floriculture/landscaping, Horticulture Business Management. ☞Supervising Research Projects of Ph.D., M.Sc. and B.Sc. students. ☞**Incharge of the University lawns/gardens.** Organized Mega Flower Shows, Flower Arrangements in the university two times every year since 2009. **Professor on Tenure Track System:** 28-05-2010 to date **Affiliation with International Organizations**: • With permission from University worked part time with Fincon Services Pakistan, H # 798, St # 16, I-8/2, Islamabad during 2011 in a research project "Agriculture Value Chain Assessment-USAID" as Horticulture Specialist. • Having permission from University working part time with FAO as Technical Specialist (Agriculture) for "Institutional Assessment for Integrating Disaster Risk Management into Agriculture Planning and Programming Process"
Administrative/ Financial Responsibilities	**Incharge Research Farm, Store & Transport at** Hill Fruit Res. Station Murree from Jan. 1990 to Aug. 1992. Responsible for Farm management, Purchase of store items for the entire station, maintaining record of purchase, issue orders, auctions and dead stock. Managing and maintaining transport and its record. **Incharge Research Farm & Nursery at Hill Fruit Res. Station Murree** from May. 1996 to Nov. 1999. Responsible for Farm & nursery management. **Member Purchase Committee for the Chief Minister Project for "Beautification of Murree"** from 1997 to Nov. 1999. **Chairman: Department of Horticulture, University of Arid Agriculture, Rawalpindi,** Sept. 2003 to 25 Feb. 25, 2004 and Dec. 1, 2004 to Date. **Responsibilities:** ● Administrative and financial management of the department. ● To disseminate the production technology of horticultural crops through publications, students and direct contact with farmers. **Project Director:** Higher Education Commission Project "Production of Pathogen Free Horticultural Plants". Dec. 1, 2004 to Sep. 30, 2007 (Project completed successfully). **Chairman University Purchase Committee: 27-09-07 to 10-09-12**. Responsible to conduct purchase of all university items like equipment, chemicals, glass ware, furniture etc. according to the

	prescribed criteria. **Coordinator of PMAS-AAUR Sub-Campus Khushab:** 05-01-07 to 01-01-2014. Established the sub-campus and after that provided support/guidance in running different academic programs. Financial matters of the sub-campus with the treasury at main campus are also handled. **Principal Officer Estate Care/Security:** of PMAS AAUR. 31-03-08 to 04-03-2014. Responsible to take care of the university property, paying bills and keeping the university environment secure for smooth working. • **Professor Incharge University Gardens/Lawns:** of PMAS-AAUR. 13-12-12 to date. Responsible for management of university lawns, landscape designing and its implementation including financial handling.
PROJECTS:	1. Maximization of gladiolus corms production through soil amendments, Rs. 87000/ Sponsored by PMAS-AAUR (2004). 2. Production of pathogen free horticultural plants, Rs. 35.884 million, Sponsored by HEC (2004-2007). 3. Collection of loquat genotypes of Pakistan and their multiplication through conventional vegetative methods and tissue culture techniques, Rs. 2.5 million, Sponsored by HEC. (2010-2013) 4. Pre and post harvest treatments of food grade chemicals to improve peach fruit quality and shelf-life, Rs.1.992 million, Sponsored by PSF (2010-2013). 5. Jelly seed disorder in mango fruit-causes and control, Rs. 4,99,290 Sponsored by HEC. (2012-2013) 6. Oil extraction and mass propagation of scented rose species, Rs. 50000 Sponsored by HEC. (As a Co-PI). (2012-2013) 7. Improving yield, quality and storage life of bell pepper by use of food grade chemicals.Rs. 3.14million, Principal Investigator Dr. Nadeem Akhtar Abbasi. Project No.PSF/NSLP/P-UAAR (264). Sponsored by Pakistan Science Foundation. (2014-2016). 8. Improvement of berry quality and postharvest performance of grapes cv. Perlette and King's Ruby by using food grade chemicals. Rs. 10.96 Million sponsored by HEC. (2014 – 2016). 9. Value addition of selected stone fruits by osmotic dehyderation and hot air drying. Rs. 4.0128 Million sponsored by HEC (As Co-PI). (2014-16).
TRAININGS/ WORKSHOPS/ CONFERENCES	1. Participated in Annual International Conference of International Society of Horticultural Sciences in **Montreal, Canada** in August 1995. (July 30 to August 3) 2. Training on "Diagnosis and management of fruit and vegetable crop diseases", held at National Agriculture Research Center, Islamabad, Pakistan (12th May to 3rd June,

	1998). 3. Seminar on "Efficient and Rapid HPLC and LC/MS Methods Development" on 21-05-04 at Perth, WA, organized by WATERS Asia Pacific. 4. Participated in seminar on "Gas Chromatography: How to Gain Efficiency and Improve Results, June 2004 in Perth, WA organized by BIOLAB Ltd. 5. Workshop for information forming the basis of 'Salty Business', on 11-06-04 at Perth, WA, organized by Department of Agriculture, Govt. of WA. 6. Conference on "Postharvest Unlimited Downunder 2004" organized by Food Science Australia co-bagged by International Society of Horticultural Sciences from 10-12 Nov. 2004 in **Sydney, Australia**. 7. International workshop on "Sanitary and Phytosanitary Measures in the Wake of Trade Liberalization: Challenges to Agriculture in Developing Countries 12–14 Jan., 2005 organized by UAAR, sponsored by Pakistan Academy of Sciences. 8. "Improving the quality and safety of fresh fruits and vegetables: a practical approach" Sub-regional workshop organized by **FAO** in cooperation with the Thailand DOA, **Bangkok, Thailand**, 28 Feb. – 4 Mar., 2005. 9. First International Conference on **Mango and Date Palm**: Culture and Export held on 20th – 23rd June, 2005 at Univ. of Agriculture Faisalabad, Pakistan. 10. Seminar on Food Safety Standards for Better Export of Fruit and Vegetable Products Organized by the Asian Productivity Organization, implemented by NPO and PARC from 12 to 16 Dec. 2005 in Islamabad, Pakistan. 11. Attended "International Training Workshop on Protected Agriculture" in Yangling, Shaanxi, Min. of Science & Tech., China from Nov. 20 to Dec. 3, 2006. 12. Participated in Conference on "Olive Oil Production: National Prospective and Sustainable Expansion" held at NARC – Islamabad on 12 May, 2008. Organized by Embassy of Italy and Instituto Abgronomico Per l'Oltremare. 13. Organized two training courses on "Poly Tunnel Farming" during Feb. 2-8 and 16-22, 2009 at PMAS-Arid Agriculture Univ. Rawalpindi in collaboration with Agribusiness Support Fund. 14. Participated and delivered lecture in "National Workshop on Streamlining Commercial Floriculture on Modern lines to gain foothold in Niche Markets" lecture titled "Postharvest management of cut flowers" on 26th March, 2009 held at NARC, Islamabad, organized by Horticultural Foundation of Pakistan. 15. Participated and presented country paper in "Seminar on Good Agricultural Practices (GAP) and Safety

	for Fruit Crops and Vegetables: Managing Food Quality" 29 June – 3 July, 2009, Yogyakarta, Indonesia organized by DG of Horticulture, Min. of Agriculture Indonesia, sponsored by APO Japan. 16. Participated and presented paper and posters in International Conference on Postharvest Pacifica 2009 from 15 to 19 Nov. 2009, in Napier, New Zealand. 17. Participated and presented papers in III International Symposium on Loquat in Antakya - Hatay, Turkey from 03-06 May, 2010. 18. Participated and presented paper in "Expert Consultation Meeting on Postharvest and Value Addition of Horticultural Produce 2010" from Nov. 29 to Dec. 2, 2010 at Marriott Hotel, Putrajaya, Malaysia organized by Malaysian Agricultural Research and Development Institute (MARDI) and Asia-Pacific Association of Agricultural Research Institutions (APAARI). 19. Participated and presented paper "Foliar spray of ethanol affected fruit growth, yield and postharvest performance of '*Sahil*" tomato" in 4th ISHS Conference on " Postharvest Unlimited" from May 23 – 26, 2011 in Leavenworth, Washington, USA. 20. Attended Workshop, GLOBAL G.A.P., Risk Assessment on Social Practices (GRASP), GRASP Module – DRAFT Interpretation for Pakistan, For Stakeholders Consultation in PC Lahore on April 19, 2012. 21. Participated and chaired a session in "Citrus Growers Conference" May 9-10, 2012 under Australia-Pakistan Agriculture Sector Linkages Program (ASLP Citrus Project) organized by IHS, Univ. of Agri. Faisalabad, HRI, NARC Islamabad. 22. Participated in Training Program (21st – 24th May, 2012) on International Featured Standards (IFS-6) offered by Star Farm Pakistan (Pvt.) Ltd. by Mr. Peter Wang (IFS Asia Representative and Head of IFS Asia Office, China). 23. Professional Development Training Program on "**Agri – Business Management**" 5 -16 November 2012 at Asian Institute of Technology, Thailand. 24. Training course on "Treatment and Utilization of Agriculture Waste for Developing Countries" July 16 to Aug. 12, 2013 in Chengdu, China, organized by Biogas Institute of Ministry of Agriculture sponsored by Ministry of Commerce P.R. China. 25. Participated in Multicountry Observational Study Mission on Innovative Farm Management Practices to enhance Agricultural Productivity held in Tokyo Japan on 18-22 Nov., 2013 sposored by Asian Productivity Organization vide project No. 13-AG-04-GE/DC-OSM-B. 26. Participated in Seminar on "Characterization of native &

	potential mango varieties in relation to ceratocystis manginecans and other economic traits" at University of Agric. Faisalabad on Sep. 10, 2014, sponsored by PARB, organized by HIS and ORIC UAF.
ORGANIZATIONAL MEMEBERSHIP	1. International Society for Horticultural Science (ISHS) currently suspended for non-payment of fee. 2. Agricultural Foundation of Pakistan. 3. Life Member of Islamabad Horticultural Society, Islamabad; General Secretary for 2014-2015.. 4. Life member of Pakistan Botanical Society, Vice President for 2008 – 2011. 5. Member Pakistan National Society of Horticulture

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	production in cabbage (Var. Capitata). Sarhad J. Agric. 19(2): 194-197. • Ahmed, M.S., **N.A. Abbasi** and M. Amer. 2003. Effects of IBA on hardwood cuttings of peach rootstocks under greenhouse conditions. Asian J. Pl. Sci. 2(30): 265-269. • Ahmad, A., **N. A. Abbasi** and K. K. Khoker (2003). Performance of F1 Russian hybrids cabbage under Rawalindi/Islambad Climatic Conditions. Sarhad J. Agric 19(3) :325-327. • **Abbasi. N.A**., I. A. Hafiz and B. Fazal. 2004. Evaluation of exotic Potato varieties under ecological condition of Islamabad. Int. J. Agric. Boil.1560-8530/2004/06-3-479-482. • **Abbasi, N. A.**, S. Zahoor and K. Nazir. 2004. Effect of pre harvest phosphorus and potassium fertilizer and post harvest $AgNO_3$ pulsing on the postharvest quality and shelf life of Zinnia (Zinnia elegans cv. Blue Point) cut flowers. Int. J. Agric. Biol. 6 (1): 129-131. • Sahar, T., I. A. Hafiz, **N. A. Abbasi** and S. Zahoor. 2005. Effect of Seedling Age and Different Levels of Phosphorus on Growth and Yield of Cucumber *(Cucumis sativus L*.) Int. J. Agric and Biol. 7(2): 311-314. • **Abbasi, N.A**., T. Mehmood, I.A. Hafiz and S. Khalid. 2005. Quality and Yield Responses of Cucumber (*Cucumis sativus* L.) to Soil Drench of L-Tryptophan.. Bangladesh J. Pl. Pathology 20(1-2): 9-12. • Javid, Q. A., **N. A. Abbasi**, N. Saleem, I. A. Hafiz and A. L. Mughal. 2005. Effect of NPK fertilizer on performance of Zinnia (*Zinnia elegans*) Wirlyging Shade. Int. J. Agri. Biol. 7(3): 471-473. • Javid, Q. A., **N. A. Abbasi**, and I. A. Hafiz. 2005. Performance of Zinnia (*Zinnia elegans*) "Dahlia Flowered" Crimson Shade by application of NPK fertilizer. Int. J. Agri. Biol. 7(4) 474-476. • Saleem, N., H. Rashid, **N. A. Abbasi**, I. A. Hafiz and A. Muhammad. 2005. Regeneration of banana cultivar "Dwarf Cavendish" (Musa Spp.) from callus culture. Pak. J. Phytopathol. 17(1): 4-9. • Hussain, K., Z. Chaudhary, I. A. Hafiz, N. Saleem and **N. A. Abbasi**. 2005. *In vitro* callogenesis and regeneration response of four tomato (*Lycopersicon esculentum* M.) cultivars. Pak. J. Phytopathology. 17(1): 22-29. • Hafiz, I. A., N. Anwar, **N. A. Abbasi** and A. A. Asi. 2005. Effect of various doses of gamma radiation on the seed germination and seedling growth of mango. Sarhad J. Agri. 21(4):563-567. • **Abbasi, N. A**., N. Shaheen I.A. Hafiz and S. Tanveer. 2005. Foliar Application of Calcium Chloride on Fruit Quality of Tomato (*Lycopersicon esculentum* L.). Pak. J. Arid Agric. 8(1): 5-8. • Shahid, M. N., **N. A. Abbasi** and N. Saleem. 2006. Effect of Different Compost Preparations and Lime Concentrations on the Yield of *Pleurotus sajor-caju*. . Int. J. Agri. Biol. 8(1): 129-131. • **Abbasi, N. A**. and M. M. Kushad. 2006. The activites of

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Memberships	1. Agricultural Foundation of Pakistan 2. International Society for Horticultural Science (ISHS) 3. Islamabad Horticultural Society, Islamabad 4. Pakistan Botanical Society (Life time Member since 2007)
Service Activity	• Teaching of Courses of Horticulture Science to B.Sc (Hons), M.Sc. (Hons) and PhD Students • Management of progeny orchards, Glasshouse and nursery management • Incharge Laboratory
Brief Statement of Research Interest	1. Lawn In-charge of the PMAS- Arid Agriculture University, Rawalpindi. 2. Director of Farmers Market Private (Hydroponic Project) 3. Area In-charge of Experimental Orchard **Technology Transfer** 1. Participated in different farmer's field days in Punjab. 2. Advised the officers of Horticultural Research Institutes on planning and development of horticulture industry. 3. Addressed to the fruit growers and grower groups on production technology and marketing/export. 4. Promoted new technology through TV, radio and newspapers. 5. Provided the technical information on fruit production and quality management according to the needs of target export markets.
Projects	**Submitted** • Designing production technology for promising grapes varieties. Rs. 10.928 million, as Co PI. PARB. • Mass propagation of promising varieties of olive through in vitro techniques. Rs. 42 million, as PI. PARB. **Approved/Ongoing** • Varietal Improvement of Gladiolus through in vitro Mutation. Rs 3.2 million, as PI approved by HEC. • Technology transfer to potato growers in relation to pathogen free seed potato, management of diseases and adoption of improved agro techniques. Rs. 3.245 million, as PI. Approved by Endowment Fund

	Secretariat (FDTTPC) UAAR. • Production of Pathogen Free, True to Type Olive Plants through Tissue Culture. Rs 5.859 million. As Co PI, approved by HEC. **Completed** • Development of *In Planta* Transformation System for Wheat worked as CO PI in the Project of HEC

Publications	**Hafiz I. A.**, Abbasi N. A., Hussain A., and Naqvi M. S. 2006. The methylation sensetive amplification polymorphism in Juvenile and adult phase crab apple *(Malus micromalus)* Pak. J. Bot., 38 (4):1149-1157. **(IF 0.444).** Hasnat, R., N. A. Abbasi, T. Ahmad and **I. A. Hafiz**. 2007. Induction and regeneration of hypocotyls derived calli in hot chilli (Capsicum frutescens L.) varieties. Pak. J. Bot., 39(4): 1296-1275. **(IF 0.444).** Ahmad, T., N. A. Abbasi, **I. A. Hafiz** and A. Ali. 2007. Comparison of sucrose and sorbitol as main carbon energy sources in micropropagation of peach rootstock GF-677. Pak. J. Bot., 39(5): 1787-1795. **(IF 0.444).** Micheli M., **I. A. Hafiz** and A. Standardi. 2007. Encapsulation of *in vitro* derived explants of olive (*Olea europaea* L. cv. Moraiolo) II: Effect of storage on capsule and derived shoots performance. Scientia Horticulturae, 113: 286-292. **(IF 0.69).** Germana M. A., **I. A. Hafiz,** M. Micheli and A. Standardi. 2007. Preliminary research on Conversion of encapsulated Somatic embryos of *Citrus reticulata* Blanco. CV. Mandarino Tardivo di Ciaculli" Plant Cell Tissue and Organ Culture., 88: 117-120. **(IF 1.13)**.

	Hasnat, R. N. A. Abbasi, **I. A. Hafiz** and T. Ahmad 2008. Effect of Different Bacterial Dilutions on Transformation Efficiency of Hot Chilli (*Capsicum frutescens* L.) Varieties. Pak. J. Bot., 40(6): 2655-2662. **(IF 0.47).** Hassan, I., T. Ahmad, **I. A. Hafiz**, N. A. Abbasi and B. Rashid. 2008. Effect of Various Auxin Treatments (Indole Butyric Acid and Naphthalene Acetic Acid) on Root Initiation of Olive Cultivars, Coratina and Carolea. Asian Journal of Chemistry, 20 (8): 6509-6517. **(IF 0.268).** Abbasi, N. A., M. Khushad, **I. A. Hafiz,** and M. Maqbool. 2008. Relationship of Superficial Scald related fruit maturity with Polyphenoloxidase and Superoxide Dismutase Activities in 'Red Spur Delicious' Apple. Asian J. Chemistry., 2008. 20(8): 5986-5996. **(IF 0.268).** Zahid, N. Y., N. A. Abbasi, **I. A. Hafiz** and Z. Ahmad. 2008. Morphological characteristics and oil contents of Fennel (*Foeniculum vulgare* Mill.) accessions from different regions of Pakistan. J. Chem. Soc. Pak., 30(6):889-895. **(IF 0.221).** **Hafiz I. A.,** N. A. Abbasi, T. Ahmad and A. Hussain. 2008. DNA Methylation Profiles Differ Between Juvenile and Adult Phase Leaves of Crab Apple (*Malus Micromalus*) Seedling Tree. Pak. J. Bot., 40(3):1025-1032. **(IF 0.47).** Abbasi, N. A., Z. Iqbal, M. Maqbool, and **I. A. Hafiz**. 2009. Postharvest quality of mango (*Mangifera indica* L.) fruits as affected by chitosan coating. Pak. J. Bot., 41(1): 343-357. **(IF 0.52).** Yaseen, M., T. Ahmed, N. A. Abbasi, and **I. A. Hafiz.** 2009. Assessment of Apple Rootstocks M. 9 and M.

	26 for *In Vitro* Rooting Potential, Using Different Carbon Sources. Pak. J. Bot., 41(2): 769-781. **(IF 0.52).** Ali, A., T. Ahmad, N. A. Abbasi and **I. A. Hafiz.** 2009. Effect of Different Media and Growth Regulators on *In Vitro* Shoot Proliferation of Olive Cultivar Moraiolo. Pak. J. Bot., 41(2): 783-795. **(IF 0.52).** Abbasi, N. A. A. Husain, M. Maqbool, **I. A. Hafiz** and Abdul A. Qureshi. 2009. Encapsulated calcium carbide enhances production and post harvest performance of potato (*Solanum tuberosum*) tubers. New Zealand J. Crop and Horticultural Sciences, 37:131-139. **(IF 0.303).** Haq, U. I., T. Ahmad, **I. A. Hafiz** and N. A. Abbasi. 2009. Influence of Microcutting Sizes and IBA Concentrations on *In Vitro* Rooting of Olive Cv. "Dolce Agogia" .Pak. J. Bot. 41(3): 1213-1222. **(IF 0.52).** Ali, A., T. Ahmad**,** N. A. Abbasi and **I. A. Hafiz.** 2009. Effect of Different Concentrations of Auxins on *In Vitro* Rooting of Olive Cultivar 'Moraiolo'. Pak. J. Bot., 41(3): 1223-1231. **(IF 0.52).** Yaseen, M., T. Ahmed, N. A. Abbasi, and **I. A. Hafiz.** 2009. *In Vitro* Shoot Proliferation Competence of Apple Rootstocks M. 9 and M. 26 on Different Carbon Sources. Pak. J. Bot., 41(4): 1781-1795. **(IF 0.52).** N. Y. Zahid, N. A. Abbasi, **I. A. Hafiz** and Z. Ahmad. 2009. Genetic diversity of indigenous fennel germplasm in Pakistan assessed by RAPD markers. Pak. J. Bot., 41(4)1759-1767. **(IF 0.52).** Hussain, A., N. A. Abbasi and **I. A. Hafiz**. 2009. Molecular Characterization and Genetic Relationship

	Among loquat (E*riobotrya japonica lindl*.) genotypes of Pakistan assessed by RAPD markers. **Pak. J. Bot., 41(5):2437-2444. (IF 0.52).** Hussain, A., N. A. Abbasi, **I. A. Hafiz**, and A. Akhtar. 2009. Morpho-Physical Characterization of Eight Loquat Genotypes in Chakwal District. **Pak. J. Bot., 41(6): 2841-2849. (IF 0.52).** Zulfiqar, B., N. A. Abbasi, T. Ahmad and **I. A. Hafiz.** 2009. Effect of explant sources and Different concentrations of plant growth regulators on *in vitro* shoot proliferation and rooting of avocado (*Persea Americana* Mill.) cv. "Fuerte" **Pak. J. Bot.,** 41(5) 2333-2346 **(IF 0.52)** Ali, A., T. Ahmad**,** N. A. Abbasi and **I. A. Hafiz.** 2009. Effect of Different Media and Growth Regulator on In Vitro shoots proliferation of Olive cultivar Moraiolo. Pak. J. Bot., 41(2): 783-795. **(IF 0.52).** Ramzan, A**., I.A. Hafiz**, T. Ahmad and N.A. Abbasi. 2010. Effect of priming with potassium nitrate and dehusking on seed germination of Gladiolus (*Gladiolus alatus*) Pak. J. Bot., 42(1): 247-258. **(IF 0.947).** Ikhlaq, M., **I. A. Hafiz**, M. Micheli, T. Ahmad, N. A. Abbasi and A. Standardi. 2010. In vitro storage of synthetic seeds: Effect of different storage conditions and intervals on their conversion ability. African J Biotechnolgy, 9(33): 5712-5721. **(IF 0.573).** Zia Uu- Hasan, .S., T. Ahmad, **I. A. Hafiz** and A. Hussain 2010. Direct Plant Regeneration From Leaves Of Prunus Rootstock Gf-677 (*Prunus amygdalus* X P. *Persica*) Pak. J. Bot. 42(6): 3817-3830. **(IF 0.947).** Razzaq, A., **I. A. Hafiz**, I. Mahmood and A. Hussain. 2011. Development of in planta transformation

	protocol for wheat. African Journal of Biotechnology Vol. 10(5), pp. 740-750, 31 January, 2011. **(IF 0.573).** Ibrahim, M., N. A. Abbasi, H. Rehman, A. Hussain and **I. A. Hafiz**. 2011. Phenological behaviour and effect of different chemicals on pre-harvest fruit drop of sweet orange cv. 'Salustiana'. Pak. J. Bot., 43(1): 453-457. **(IF 0.947).** Asghar, S., T. Ahmad, **I. A. Hafiz** and M. Yaseen. 2011. In vitro propagation of orchid (Dendrobium nobile) var.Emma white. African Journal of Biotechnology Vol. 10(16), pp. 3097-3103, 18 April, 2011. **(IF 0.573).** Hussain, A., N. A. Abbasi, **I. A. Hafiz** and S. Z. Hasan. 2011. A comparative study of five loquat Genotypes at Tret, Muree, Pakistan. Pak. J. Bot., 43(5): 2503-2505. **(IF 0.947).** Baig, M. M. Q., **I. A. Hafiz**, A. Hussain, T. Ahmad and N. A. Abbasi. 2011. An efficient protocol for in vitro propagation of Rosa gruss an teplitz and Rosa centifolia African Journal of Biotechnology Vol. 10(22), pp. 4564-4573, 30 May, 2011. (**IF 0.573)** Abbas G., **I. A. Hafiz**, N.A. Abbasi and A. Hussain **2012.** Determination of processing and nutritional quality atributes of potato genotypes in Pakistan. *Pak. J. Bot*., 44(1): 201-208. (**IF 0.947**). Mahmood I., A. Razzaq, Z. D. khan, **I. A. Hafiz**, and S. Kaleem, 2012, Evaluation of tissue culture responses of promising wheat(*Triticum Aestivum L*.) cultivars and development of efficient regeneration system. *Pak. J. Bot*., 44: 277-284. (**IF 0.947**). M.M. Q. Baig., I.A. Hafiz, N.A.Abbasi, M.Yaseen, Z. Akram, and D.J. Donnelly, 2012. Reduced-starure Rosa species through invitro mutagenesis. Canadian J.

	Plant Science, (2012) 92: 1049_1055 doi:10.4141/cjps2011-199. (**IF 0.547**). Tareen, M.J., N.A. Abbasi and **I.A. Hafiz**. 2012. Effect of salicylic acid treatments on storage life of peach fruits cv. "Flordaking". Pak. J. Bot. 44(1): 119-124 **(IF 0.947)** Tareen. M. J., N. A. Abbasi and I. A. Hafiz., 2012. Postharvest application of salicylic acid enhanced antioxidant enzyme activity and maintained quality of peach cv. 'Flordaking' fruit during storage. Scientia Horticulturae, 142: 221–228. **(IF 1.527)**. Zahid, N.Y., N. A. Abbasi, **I. A. Hafiz**, A. Hussain and Z. Ahmad. 2012. Antifungal activity of local fennel (*Foeniculum vulgare* Mill) extract to growth responses of some soil diseases. African Journal of Microbiology Res., 6(1): 46-51. **(IF 0.533).** Nadeem Akhtar ABBASI†, Tariq PERVAIZ, Ishfaq Ahmed HAFIZ, Mehwish YASEEN, Azhar HUSSAIN (2013) Assessing the response of indigenous loquat cv. Mardan to phytohormones for *in vitro* shoot proliferation and rooting. Journal of Zhejiang University-SCIENCE B (Biomedicine & Biotechnology ISSN 1673-1581 (Print); ISSN 1862-1783 (Online)(**IF 1.6**) Malik Abid Mahmood1, **Ishfaq Ahmed Hafiz**, Nadeem Akhtar Abbasi and Muhammad Faheem.2013 Detection of Genetic Diversity in *Jasminum* species through RAPD Techniques INTERNATIONAL JOURNAL OF AGRICULTURE & BIOLOGY ISSN Print: 1560–8530; ISSN Online: 1814–9596 12–690/2013/15–3–505–510, *Int. J. Agric. Biol., Vol. 15, No. 3, 2013(***IF.94)**

Name	**Dr. Khalid Mahmood**
Personal	**Father's Name** : Allah Loke Qureshi **Date of Birth** : 07-03-1959 **N.I.C. NO.** : 61101-1748794-1 **Nationality** : Pakistani **Postal Address** : University of Arid Agriculture, Murree Road Rawalpindi. **Permanent Address** : Village & P.O. Panjwarian, The: Kharian Distt. Gujrat, Pakistan or House # 359, Street # 13, Shehzad Town Islamabad **Phone** : +92-51-9290771; 0300-5241628 **Email** : kmq_2008@hotmail.co.uk
Experience	**Date:** January 10. 06.1985 to 02. 02. 2000. **Title:** Scientific Officer **Institution:** Fruit Crops, National Agriculture Research Centre. Park Road Islamabad. **Date:** 02. 02. 2000 to 29-02-2007 **Title:** Senior Scientific Officer **Institution:** Fruit Crops, National Agriculture Research Centre. Park Road Islamabad. **Date:** 01.03. 2007 to date **Title:** Associate professor **Institution:** Department of Horticulture, University of Arid Agriculture, Rawalpindi
Honor and Awards	• Awarded University BSc and MSc Merit Scholarships during 1980-1984. • Awarded six months training on citrus production and management in 1989 • Won ARP 11 Merit Scholarship for Ph.D. in 1994 funded by USA. • Got merit scholarship for Post doctorate in 2007

	from Higher Education Commission, Islamabad.
Memberships	Islamabad Horticultural Society, Islamabad.
Service Activity	• Teaching of courses of horticulture science at graduate, postgraduate and Ph.D. level students. • Research and execution of developmental projects.
Brief Statement of Research Interest	• Production of Horticultural Crops • Plant Physiology • Soft Fruit Production
Publications	•
Research Grants and Contracts	**PROJECTS:** • Four years project on "Introduction of soft fruits (strawberry, blackberry, raspberry, black currant) in potential area s of Pakistan for economic return" has been completed successfully. • Three years project on "Underutilized Tropical fruit crops of Pakistan" funded by International Centre for Underutilized Crops (ICUC) has been completed successfully .
Other Research or Creative Accomplishments	No

Name	**Dr. Imran Hassan**
Personal	**Father Name:** Maqsood-ul-Hasan **Date of Birth:** 23-03-1970 **N.I.C No :** 37405-5803547-7 **Nationality:** Pakistani **Domicile :** Rawalpindi **Marital Status:** Married
Experience	Fourteen years & 10 months work experience of teaching, research and conducting examination of the under-graduate & post-graduate student in the Department of Horticulture**,** Pir Mehr Ali Shah, Arid Agriculture University, Rawalpindi **Additional Managerial Charge Experience:** Worked for **7 years** in all on additional charge as **Incharge University Lawns** from August, 1997 to May, 2000 and from May 2005 to May 2009 in PMAS, AAUR. Served for **12 years and 8 months** in all as from August, 1997 to Feb, 2002 and from May, 2005 to May 2009 nominated by Chairmen, Department of Horticulture, PMAS, AAUR. Worked **as Coordinator, Time Table & Date Sheet** of Horticulture Department from 2010 to date as nominated by Dean, FC& FS, PMAS, AAUR Served for **7 years** from 1997 to 1999 and from May, 2005 to May 2009 as Incharge Laboratory, Department of Horticulture, PMAS, AAUR

Publications	• Amjad M., M. A. Anjum and I. Hassan. 2001. Effect of N, P and K fertilizers on seed production of Okra (Abelmoschus esculentus L. Moench) cv. Pusa Sawani". The Journal of Animal and Plant Sciences. JAPS, Vol. 11(2):80-82. ISSN.1018-7081). • Banaras M., N. A. Abbasi and I. Hassan. 2006. HACCP System, Quality and safety of Fresh Fruits and Vegetables. Proceeding of International Conference on Value addition in Horticultural Products. Page 127-131 • Chaudhry A. N., S. Ali and I. Hassan. 2002. Effect of different colored plastic mulches on yield and nutrients content of tomato plant. Asian Journal of Plant Sciences. Vol 1(4):388-389. (ISSN. 1682-3974). • Hassan I., T. Ahmad, I. A. Hafiz, N. A. Abbasi and B. Rashid. (2008). Effect of various auxin treatments (Indole butyric acid & Nepthalene acitic acid) on root initiation of olive cultivars, coratina & carolea. Asian Journal of Chemistry. Vol 20(8):6509-6517 (Impact Factor) • Hassan I., Y. Zhang, G. Du, G. Wang, and J. Zhang. 2007. Effect of salicylic acid (SA) on delaying fruit senescence of Huang kum pear. Frontiers of Agriculture in China. Vol. 1(4): 456-459. • Jilani G., S. Mehmood, A. N. Chaudhry, I. Hassan and M. Akram. (2008). Allelochemicals: sources, toxicity, microbial transformation in soil. a review. Annals of Microbiology. Vol. 58(3):351-357. (Impact Factor) • WANG G., X. LI, G. QI, R. Huang, L. Wang and I, Hassan. 2003. Effect of different techniques of regulating soil water on soil water contents and fruit quality of Ya-pear. Journal of Agric. Uni. Hebei, China. Vol 26(1):24-27

Name	**Usman Shoukat Qureshi**
Personal	**Marital Status:** Married **Gender:** Male **Nationality:** Pakistani **Religion:** Islam **Date of Birth:** January 15, 1986
Experience	• Currently working as **Lecturer (BS-18), Department of Horticulture, Pir Mehr Ali Shah Arid Agriculture University Rawalpindi, Pakistan.** • Also having an additional charge of **'Campus Management Officer (CMO)'** at **Pir Mehr Ali Shah Arid Agriculture University Rawalpindi, Pakistan.**

	• Worked as a **'Member of Nursery Production Unit', PMAS Arid Agriculture University Rawalpindi, Pakistan.** **Ac** • Internship at **National Agriculture Research Centre (NARC) Pakistan** in **Horticulture Research Institute.**
Honor and Awards	**Microsoft Office:** Can prepare reports and use MS office for different purposes **Auto CAD:** Can use auto CAD programme for making Layouts of gardens, structures etc. **Flower Show:** I have organized and managed flowers show held by "PMAS, Arid Agriculture University Rawalpindi Pakistan", "Parks and Horticulture Agency (PHA) Rawalpindi Pakistan", "Attock Refinery Limited (ARL) Pakistan" and "Capital Development Authority (CDA) Islamabad Pakistan". **Private Projects:** I have designed three residential lawns at Rawalpindi. Also I have worked with DHA Phase I authority and design children park.
Publications	• Qureshi, U. S., U. Habib, S. Chughtai, N. A. Abbasi and K. M. Qureshi. 2011. Impact of hydrogel application to Bermuda grass in combating drought under rainfed condition.J. Arid Environ., (Accepted). • Qureshi, K. M., S. Chughtai and U. S. Qureshi. 2012. Impact of Exogenous Application of Salt and Growth Regulators on Growth and Yield of Strawberry. Proc. *In*: 7th International Strawberry Symposium (VII ISS), 18-22, February 2012, Beijing, China. • Qureshi, K. M., F. ul Hassan, Q. ul Hassan, U. S. Qureshi, S. Chughtai and A. Saleem. 2012. Impact of cultivation systems on growth and yield of strawberry ***(fragaria ananassa)*** cv. "Chandler". Pakistan J. Agric. Res., 25 (2): 120-135. • Qureshi, K. M., S. Chughtai, U. S. Qureshi and N. A. Abbasi. 2013. Impact of Exogenous Application of Salt and Growth Regulators on Growth and Yield of Strawberry. Pak. J. Bot., 45(4): 1179-1185. • Qureshi, U. S., U. Habib and N. A. Abbasi. 2011. Hydrogels: Phenomenal Approach for Water Conservation in Ornamental Industry. Proc. *In*: International Conference on Prospects and Challenges to Sustainable Agriculture, 14-16, July 2011. ***Projects:*** • Research Project on "Phenological studies of Citrus" Research Project on "Effect of Calcium Chloride on Post Harvest quality of Tomatoes"

Name	**NAJMA YOUSAF ZAHID**
Personal	Father's Name: Muhammad Yousaf Zahid Date of Birth: 17-04-1970 Nationality: Pakistani N.I.C. No: 37405-0555365-2 Language Skill: English & Urdu Marital Status: Married Citizenship: Pakistani
Experience	Worked with AKRSP (Agha Khan Rural Support Programme), Gilgit as consultant Agriculturist from August 1995 to April 1998. ▪ In 1999, I worked as Co. P.I in three years project funded by German with collaboration of UAAR, at chitral (NAs areas). ▪ Worked as advisor horticulturist in a one year project funded by china and UAAR at Chatta Bakhtawar village, Islamabad. ▪ As member academic council at UAAR ▪ Technical talk programmes regarding Horticulture to communicate information's to farmers in Kisan time programme on PTV world and Sohni Darti Tv Channels. ▪ As Supervisor & committee member of M.Sc (Hons.) Hort students for thesis and 2 years research every year.
Honor and Awards	1. Indigenous PhD scholarship through ministry of science and technology in 2001. 2. Awarded by research project by University in 2007
Publications	• Zahid, N.Y;N.Abbassi(2006).Fennel as Value Additive Crop: Essential Oils and Plant Extract .Proceeding International Conference on Value addition in Horticulture Products. • Zahid,N.Y;N.Abbassi(2007).Use of Allelopathic Potential of Vegetables in weed management. Proceedings of Arid Agriculture University, Rawalpindi. • Zahid,N.Y;N.Abbassi,H.Ishfaq(2008).Morphological Characterization and Oil Contents of Fennel (*Foeniculum vulgare* Mill.) Accessions from Different Regions of Pakistan.J.Chem.Soc.Pak.,vol30,No.6,2008 impact factor: 0.221 • Zahid,N.,N.Abbasi.Z.Ahmed;H.I.Ishfaq;Z.Yousaf(2009).Genetic diversity of Fennel Germplasm in Pakistan assessed by RAPD markers.J.Bot,41(3):june2009. Impact factor 0.524 • Zahid,N.Y;N.Abbassi,Z.Ahmed;H.Ishfaq(2012). Antifungal Properties of local fennel (*Foeniculum vulgare* Mill.) response to some soil diseases.Afrincan J of Microbiology research.vol 6(1) pp

	46-51.jan 2012.0.533 impact factor. • Zakia ,S; Zahid,N.Y;N.Abbassi;H.Ishfaq;M.Nasir. Booklet on Micropopagation of Aloe vera (Aloe barbadensis). Laplambert Accadamic Publishing Germany.ISBN:978-3-8443-23788.2012 Zakia,S.Zahid,N.Y;N.Abbassi;H.Ishfaq;M.Nasir.Standarization of micro propagation for Aloe vera-A Pharamaceutically important. Pak.J.of Pharmaceutical Sciences, 6 Nov 2013.vol 26, pp 1083-1087. Impact factor 0.947

Name	**TOUQEER AHMAD**	
Personal	Nationality: N. I. C. No: Passport No: Date of Birth: Domicile: Punjab(Chakwal). Marital Status: Single. Gender: Language Skills:	Pakistani. 37202-1589897-7 KH427022 23rd January 1977 Male. Full command on English, Urdu and Punjabi. Chinese (basic spoken)
Experience	Position: Period: Organization: Rawalpindi, Pakistan Field of Work: M.Sc. and B.Sc level. Supervise the Position: Period: Organization: Export Board Field of Work:	**Lecturer Horticulture** 14th Feb 2005 To date PMAS, Arid Agriculture University Teaching of various courses at PhD. Post Graduate students in their research work. Creating technical manpower through providing training in respective fields. Collaborated with farmers/fruit industry in order to improve management and solve horticulture issues. **Field Officer** 15th June 2004 To 14th Feb 2005 Pakistan Horticulture Development & Carry out research activities with the

	citrus industry to minimize the post-harvest losses in Citrus. Introduce improved orchard management practices (Good Agricultural Practices). Create awareness among different stakeholders specially the forming communities and traders on changing trade requirements regarding SPS and other issues under the WTO regime. Position: **Research Fellow** Period: 1st November 2002 To 14th June 2004 Organization: National Agriculture Research Center Islamabad, Pakistan Field of Work: Conduct project entitled "Production of Pathogen Free True to type ▪ Peach Rootstock GF 677 Plantlets through Tissue Culture". Propagation of Fruit through Conventional & Tissue Culture Method
Honor and Awards	• Establishment and Development of Plant Tissue Culture Lab in Horticulture Department of PMAS, AAUR. This landmark was achieved by my technical expertise and inspirational encouragement of Project Director, Prof. Dr. Nadeem Akhtar Abbasi • Standardization of protocols for mass scale *in vitro* propagation of economical important fruit and ornamental crops
Publications	Touqeer Ahmad, G. Sablok, T. V. Tatarinova, Q. Xu, X. X. Deng and W.W. Guo. 2013. Evaluation of codon biology in Citrus and Poncirus trifoliate based on genomic features and frame corrected expressed sequence tags. DNA-Research. 20 (2): 135-150. IF. 5.15 Mirza Muhammad Qadeer Baig, Ishfaq Ahmad Hafiz, Azhar Hussain, **Touqeer Ahmad** and Nadeem Akhtar Abbasi. 2011. An efficient protocol for in vitro propagation of Rosa gruss an teplitz and Rosa centifolia. Afr. J. Biotechnol. 10(22):4564-4573**. IF. 0.573** Sana Asghar, Touqeer Ahmad, Ishfaq Ahmad hafiz and Mehwish Yaseen. 2011. In Vitro Propagation of Orchid (Dendrobium nobile) Var. Emma White. Afr. J. Biotechnol. 10(16): 3097-3103. IF. 0.573 Syed Zia ul Hasan, Touqeer Ahmad, Ishfaq Ahmad Hafiz, and Azhar Hussain. 2010. Direct Plant Regeneration From Leaves of Prunus Rootstock GF-677 (Prunus Amygdalus x P. Persica). Pak. J. Bot., 42(6): 3817-3830. IF. 0.872 Asia Ramzan, Ishfaq Ahmad Hafiz, Touqeer Ahmad and N. A. Abbasi. 2010. Effect of Priming with Potassium Nitrate and Dehusking on Seed Germination of Gladiolus (gladiolus alatus). Pak. J. Bot., 42(1): 247-258. IF. 0.872 Bushra Zulfiqar, Nadeem Akhtar Abbasi, Touqeer Ahmad, and Ishfaq Ahmed Hafiz. 2009. Effect of Explant Sources and Different Concentrations of Plant Growth Regulators on In vitro Shoot Proliferation and Rooting of Avocado (Persea americana Mill.) CV. Fuerte. Pak. J. Bot., 41 (5): 2333-23461. IF. 0.872 Ansar Ali, Touqeer Ahmad, Nadeem Akhtar Abbasi and Ishfaq

	Ahmed Hafiz. 2009. Effect of Different Concentrations of Auxins on In Vitro Rooting of Olive Cultivar 'Moraiolo'. Pak. J. Bot., 41 (3): 1223-1231. IF. 0.872 Mehwish Yaseen, Touqeer Ahmed, Nadeem Akhtar Abbasi, and Ishfaq Ahmed Hafiz. 2009. In Vitro Shoot Proliferation Competence of Apple Rootstocks M. 9 and M. 26 on Different Carbon Sources. Pak. J. Bot., 41 (4): 1781-1795. IF. 0.872 Inam ul Haq Touqeer Ahmad, Ishfaq Ahmed Hafiz and Nadeem Akhtar Abbasi. 2009. Influence of Micrcutting Sizes and IBA Concentrations on In Vitro Rooting of Olive Cv. "Dolce Agogia". Pak. J. Bot., 41 (3): 1213-1222. IF. 0.872 Mehwish Yaseen, Touqeer Ahmed, Nadeem Akhtar Abbasi, and Ishfaq Ahmed Hafiz. 2009. Assessment of Apple Rootstocks M. 9 and M. 26 for In Vitro Rooting Potential, Using Different Carbon Sources. Pak. J. Bot., 41 (2): 769-781. IF. 0.872 Ansar Ali, Touqeer Ahmad, Nadeem Akhtar Abbasi and Ishfaq Ahmed Hafiz. 2009. Effect of Different Media and Growth Regulators on In Vitro Shoot Proliferation of Olive Cultivar Moraiolo. Pak. J. Bot., 41 (2):783-795. IF. 0.872 Imran Hassan, Tauqeer Ahmad, Ishfaq Ahmad Hafiz, Nadeem Akhtar Abbasi and Basit Rashid 2008. Effect of Various Auxin Treatments (Indole Butyric Acid and Naphthalene Acetic Acid) on Root Initiation of Olive Cultivars, Coratina and Carolea. Asian Journal of Chemistry. 20 (8): 6509-6517. IF. 0.253