



**PIR MEHR ALI SHAH
ARID AGRICULTURE UNIVERSITY
RAWALPINDI**

DEPARTMENT OF BIOCHEMISTRY

Ph.D Degree Program

**Self Assessment Report
(2012-2014)**

Program Self Assessment Team

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Introduction

The discipline of Biochemistry in PMAS-AAUR was initially introduced under the umbrella of the Department of Biological Sciences in 1998 and as a separate Department in 2003. Different ongoing degree programs in Biochemistry are; Ph.D, M.Phil, M.Sc. and BS initiated in 2001, 1998, 2006 and 2011 respectively. The program of Biochemistry is designed to provide necessary skills and knowledge in applying biochemical and molecular approaches for solution of problems related to health, agriculture, environment and biotechnology.

The Department of Biochemistry has the privilege to recruit highly qualified and competent faculty with doctorate/post-doctoral experience from reputable International Universities/Institutes. There are eight regular faculty members having specialization in the field of Biochemistry, Environmental Biochemistry, Molecular Biology, Biotechnology, Protein Chemistry and Enzymology. Presently the department has a total enrollment of strength of 412 students in different degree programs.

The curriculum of Biochemistry is designed based on international standards with highly competitive and advanced courses. The courses offered provide students an extensive exposure of Biochemistry, Molecular Biology and Biotechnology with updates on future challenges. With the latest development in the field of Biochemistry, Molecular Biology and Biotechnology, the Department regularly updates its curriculum by keeping in view the recent advances in Biochemistry. As a result the Department has established good reputation in a very short period of time. Under Biochemistry discipline, the department is not only conducting its own degree programs but also offering compulsory taught courses to various departments in FoS, FC&FS and FV&AS at BS, M.Sc, MS, M.Phil and PhD levels. Under Biochemistry discipline a total of 872 graduates have been produced till 2014 including 742 M.Sc, 108 M.Phil and 22 PhDs.

All Biochemistry faculty members are HEC approved supervisors for Indigenous Ph.D. programme. Under this program 11 PhD scholars have successfully completed their degrees while 24 are at various stages of their research work. Besides faculty members have earned 20 personal research grants from various funding agencies of which 9 research projects are already completed, 11 are ongoing while 11 are submitted/under review. The faculty has 483 publications including 380 full length research publications in impactored journals, 200 other publication and 3 books. The total impact factor of the Biochemistry faculty is 486.

Along with regular academic activities, the Department of Biochemistry has the tradition to conduct scientific conferences/workshops/symposia/seminars to train young scientists with modern techniques in Biochemistry, Molecular Biology and Biotechnology. Uptill now the department has organized 3 conferences and 13 workshops/seminars. To strengthen the academic and research activities, Biochemistry faculty has established active international scientific collaborations with University of California Davis (USA), Iowa State University (USA), University of Michigan (USA), Fayetteville State University (USA), Reading University (UK), University of Waterloo (Canada), McMaster University (Canada), University of Salzburg (Austria), Uppsala University (Sweden), Ghazi University (Turkey), Institute of Agra Technik Potsdam (Germany), Denmark Technical University (Denmark), University of Bologna (Italy). The Department has developed active collaborations with large number of National Universities and Research Institutes.

SECTION 1:

Components of Self-Assessment Process:

This Self-Assessment Report has been prepared on the basis of following eight criteria as described in Self-Assessment Manual

Criterion-1: Program Mission, Objectives and Outcomes

Introduction

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

Mission Statement of the Department of Biochemistry:

To produce future scientists/academics able to effectively disseminate gained knowledge in a cross-disciplinary research environment

Standard 1-1: Documented Measurable Objectives

1. To plan problem oriented research with emphasis on biochemistry/molecular biology and biotechnology
2. To conduct high quality scientific research with strong theoretical and practical skills
3. To present and communicate research finding to broader scientific communities

Expected Outcomes

1. To produce different lot of students and researchers e.g .M.Sc. M.Phil and Ph.D in Biochemistry and Biotechnology.
2. To make the students and researchers able to handle the different techniques independently.
3. Different institutes and universities will be provided the facility of advance techniques for their research problems like DNA Sequencer, GC, HPLC, PCR, RT-PCR, plant tissue culture, genetic transformation, cloning & gene expression and Electrophoresis.
4. Approximately 2 conferences and 11 workshops/seminars have been organized since 2004
5. Different conferences have been organized to facilitate exchange of ideas.

Main Elements of Strategic Plan to Achieve Mission and Objectives

1. Post-graduate research with reports and theses
2. Setting up of well equipped specialized research laboratories depending on the available resources.

3. Development of a sound teaching system for the award of degrees based on the experience and vision gathered from world reviews, literature, innovations, proceedings, and symposia etc
4. Publication of scientific papers, books, manuals etc.
5. Designing and constantly updating the curricula involving core subjects, elective subjects and specialized areas and study tours.
6. Implementation of research projects funded by the universities and other agencies.
7. Development of linkages with National and International research organizations to faster research.

TABLE-1: PROGRAM OBJECTIVES ASSESSMENT

S. #	Objective	How Measured	When Measured	Improvement Identified	Improvement made
1	To plan problem oriented research with emphasis on biochemistry/molecular biology and biotechnology	On the basis of evaluation by students. Evaluation of synopsis.	It is a semester based officially set process.	Training of students for research planning.	Emphases on research planning and report writing skills through written and orally defended synopsis.
2	To conduct high quality scientific research with strong theoretical and practical skills	Comprehensive examinations, through evaluation process Scientific workshops participation	Regular student supervisor meetings	Planning ahead and time management	Scheduled meetings, Pre-planning research activities and timely identification of issues/problems
3	To present and communicate research findings to broader scientific communities	Synopsis/thesis defense International/national scientific meetings/conferences	Officially set time-frame.	To prepare, present and communicate scientific findings	Communication skill development through presentations/seminars Writing skills through scientific abstracts/manuscript preparation

TABLE-2 STANDARD 1-2: OBJECTIVES VS OUTCOMES

	Objectives			
	Sr. No.	1	2	3
Outcomes	1	++	++	+++
	2	+++	++	++
	3	++	+++	++
	4	+++	+++	+++
	5	++	++	++

Key: ++ = Relevant

+++ = Highly Relevant

The program outcomes are fully supportive to program objectives mentioned above.

Outcomes are based on actual details obtained from department documents.

PROGRAM ASSESSMENT RESULTS

It is important for student progress to be consistently evaluated and reported in relation to curricular outcomes. Information derived from the fair assessment and evaluation of students provides valuable information on the student success in relation to curriculum expectations and identifies areas of strength and challenges at the student, department and university level. At the same time, it is also important to get the feedback from the students in form of course/instructor assessment. These assessment via performa no 1 and 10 (as per PMAS-AAUR rules) serves as an overarching framework that provides a way to structure, evaluate, and improve the learning experience of our students across all programs being offered by Department of Biochemistry.

The 4th SAR for Ph.D programm assessment is divided into four sections;

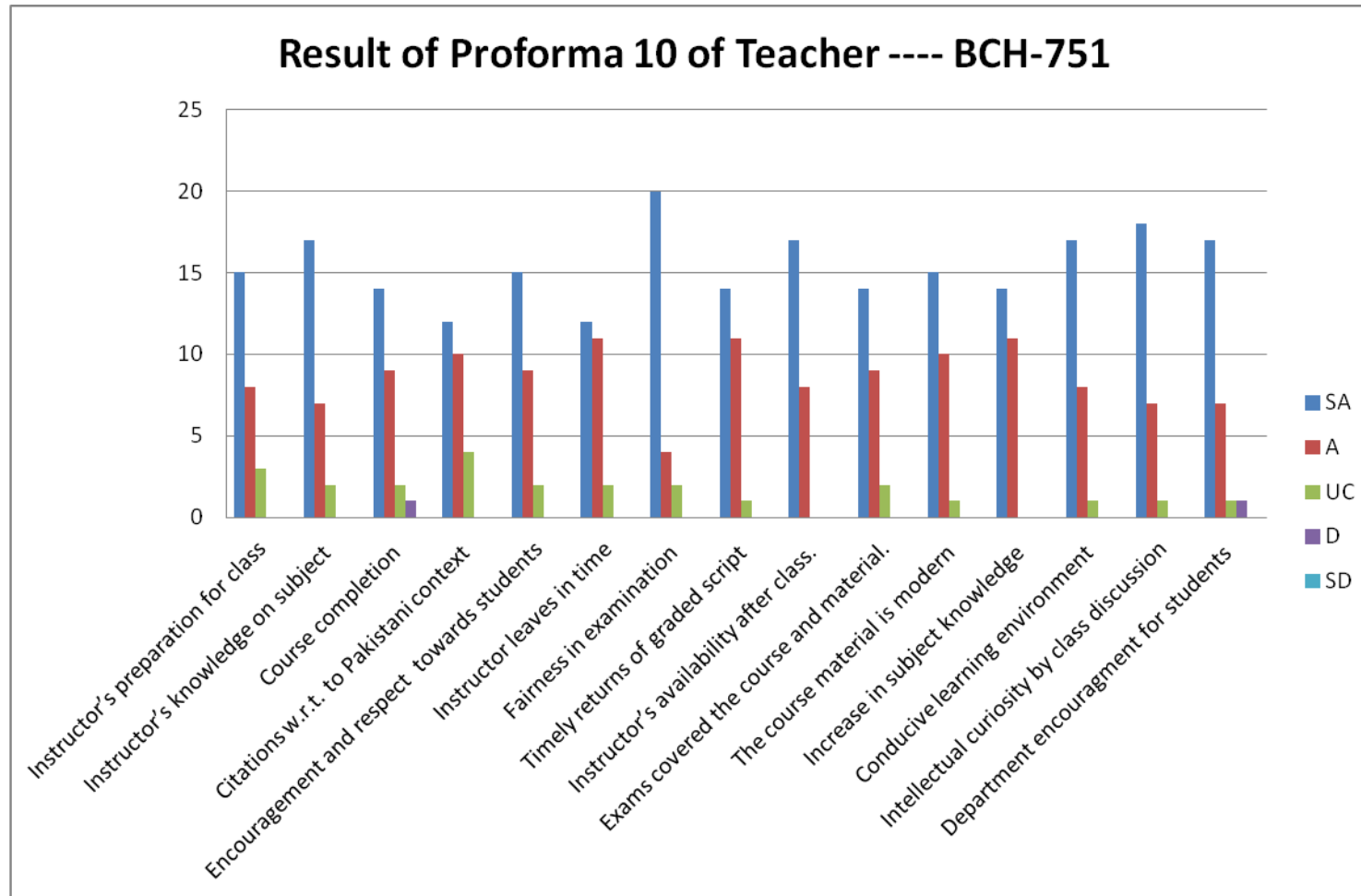
1. Assessment results of Fall, 2012
2. Assessment results of Spring, 2013
3. Assessment results of Fall, 2013
4. Assessment results of Spring, 2014

Each assessment covers a semester and is further divided into two sections, which deals with performa no 1 and 10, respectively.

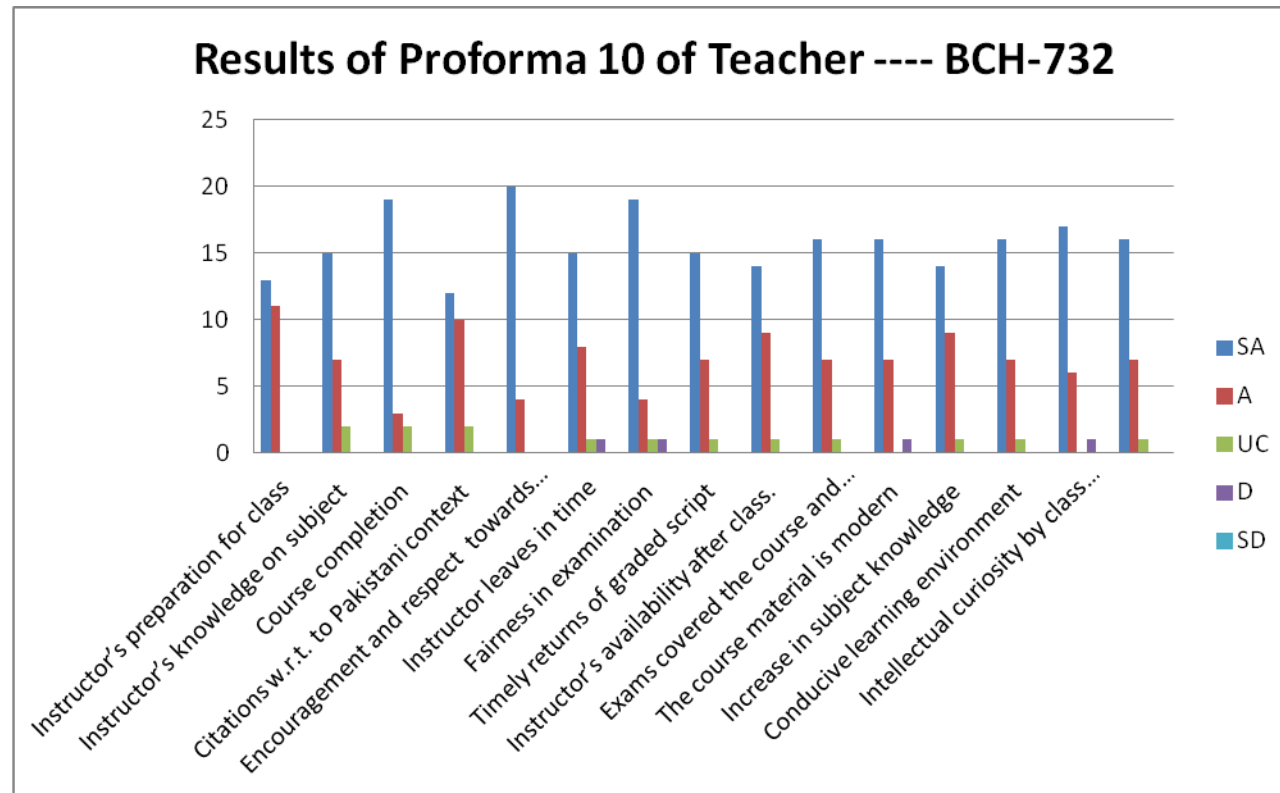
1. Fall Semester 2012

1.1. Overall Results of Performa 10 of Teacher's Evaluation

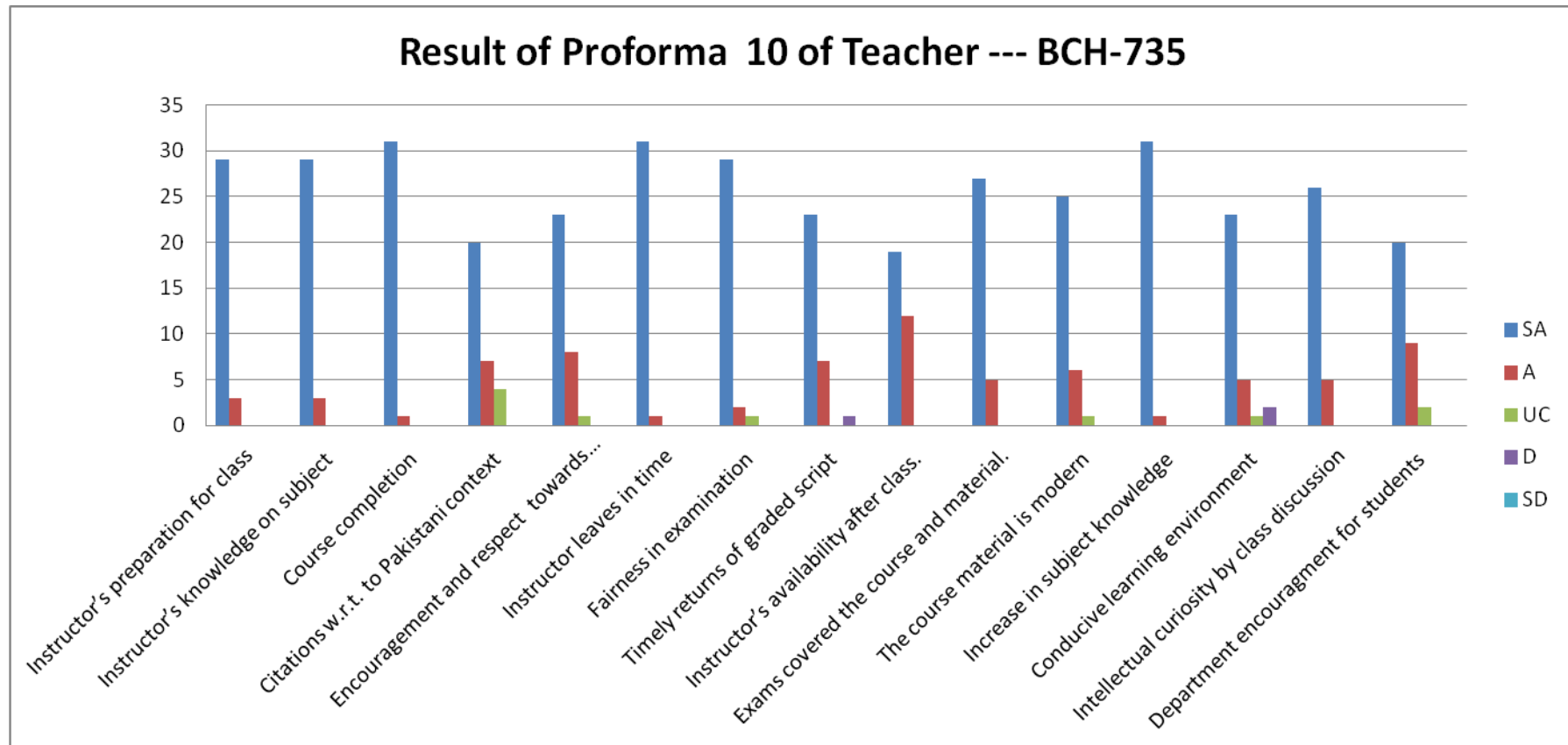
Performa 10 is actually meant for the evaluation of course instructors by the students at the end of the semester. This helps the course instructor to identify his/her strong and weak points. This understanding leads to more promising and fruitful input by the course instructor in the upcoming semester. Thus, this activity enhances the overall quality of teaching in the respective department which strengthens the university as a whole. In this context, course instructors (mentioned as Teacher 1, 2 and 3) of the Ph.D courses (BCH-751, BCH-732 and BCH-735) taken by students in fall, 2012 were evaluated and the results were presented in the form of graphs. The results clearly indicate that the teachers were giving satisfactory performance and students considered them as competent and learned faculty (See Graph 1, 2 and 3). The individual interpretation of the teacher follows each graph.



Teacher 1 who took BCH-751 had been fair in examinations. Students liked the conducive learning environment, intellectual development and the presence of the instructor after class.



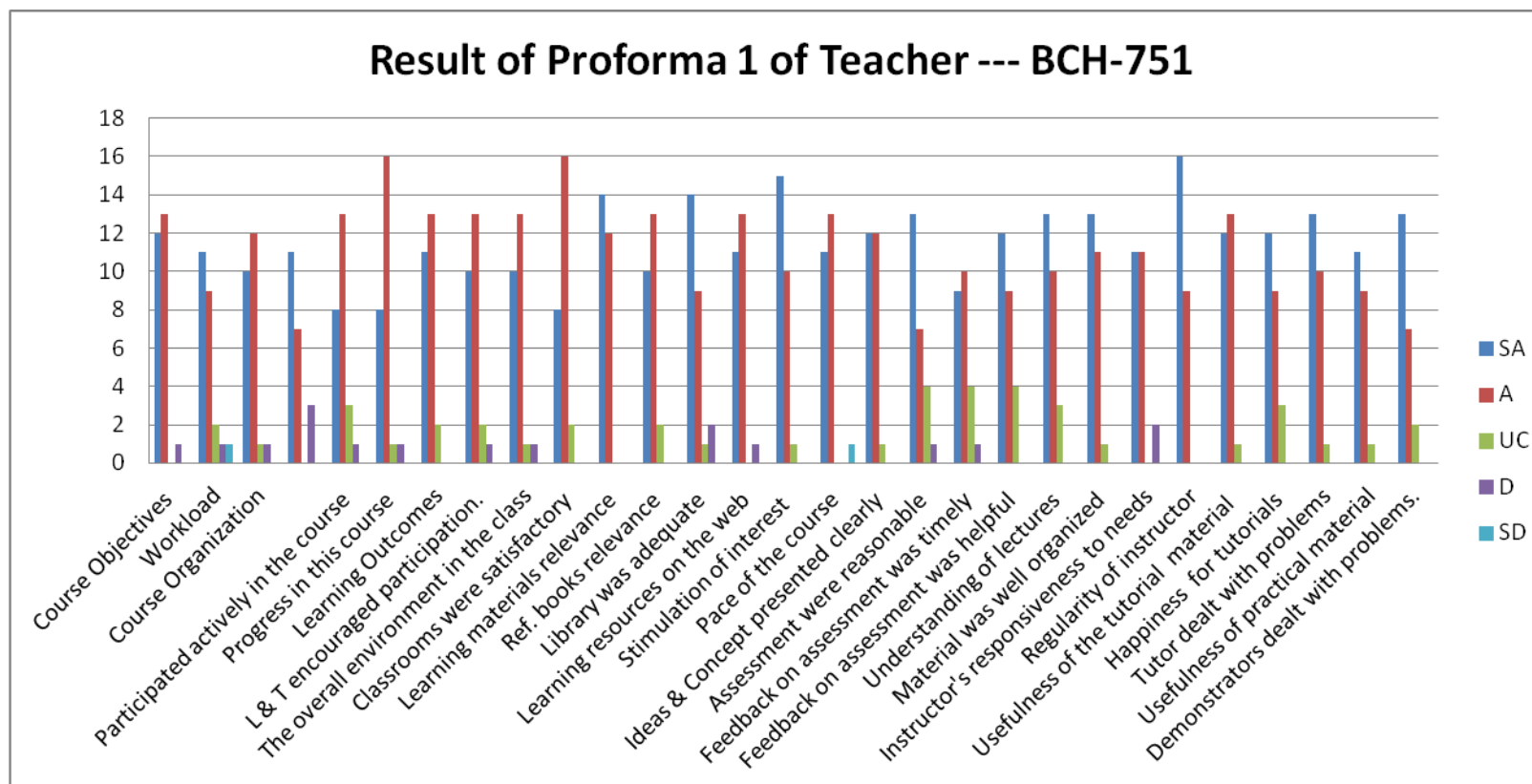
Most students found Teacher 2 showing respect and encouragement to them as his/her strongest point which follows course completion and fairness in examinations.



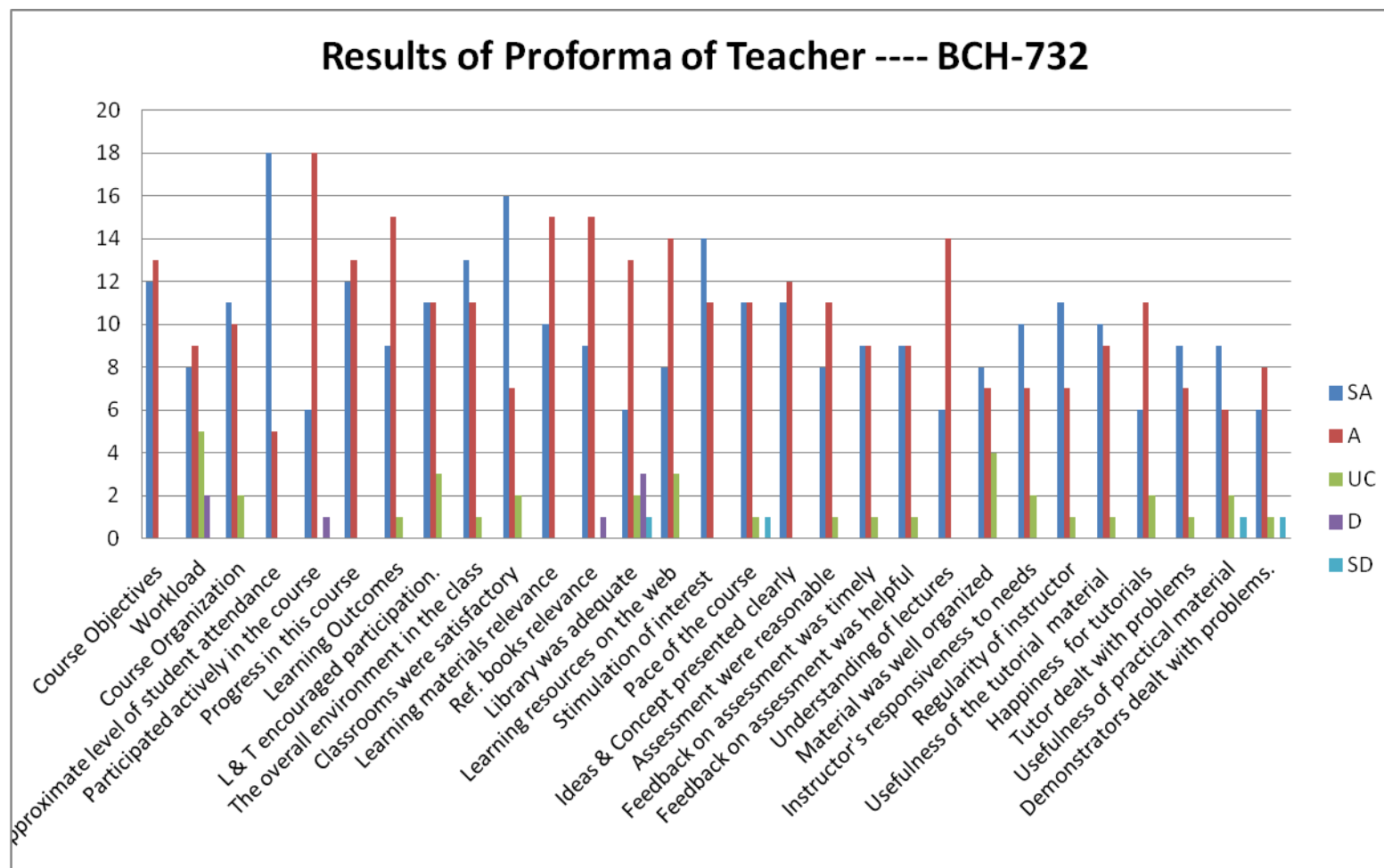
Teacher 3 had completed the course which led to the increase in subject knowledge of the students. Also instructor is punctual and work in given time frame properly. He/She was also well prepared for the class which also depicted his/her command/knowledge over the subject.

1.2. Student Course Evaluation Fall Semester 2012:

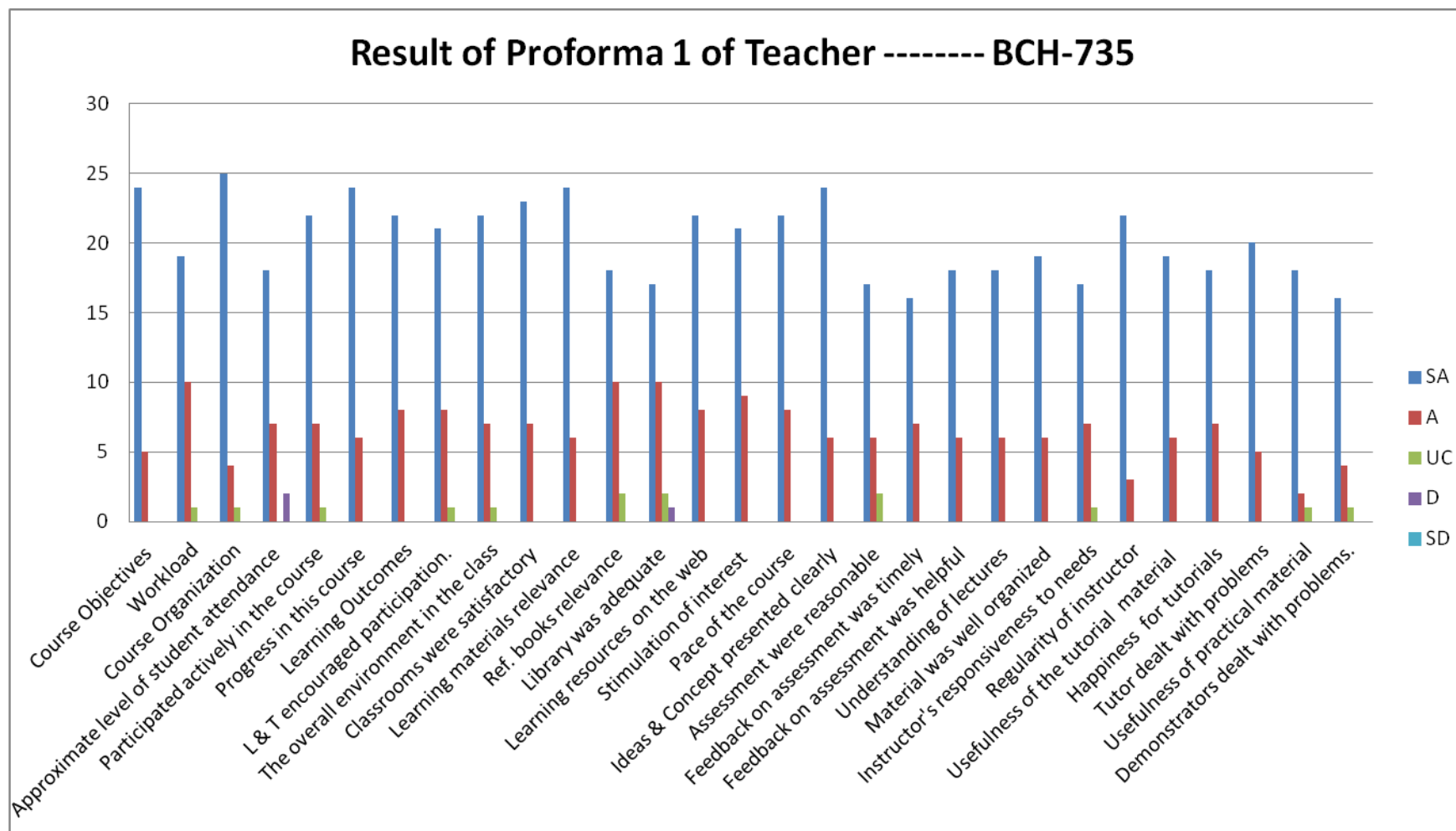
The main objective behind getting performa No. 1 evaluation by students is to get feedback on course design, course contents (both theoretical and practical), its relevance with degree's subject and teaching material along with the departmental infrastructure. It also addresses queries related to timely completion of course work, load distribution and instructor's communication and handling skills. As for performa no 10, performa no 10 was also evaluated for three courses of PhD and M.Phil which includes BCH-751, BCH-732 and BCH-735. The results obtained are as follows;



Depending upon the results of Performa.1, it is evident that the course had clear objectives, manageable work load and was organized properly. The course BCH-751 actually stimulated their interest which could be due to regularity of the course instructor, and having access to the useful relevant material of the course. Students also showed overall satisfaction over their progress because of efficient dealing of the demonstrator with their problems.



Student showed satisfaction over their attendance during the course and the overall environment of the class. The course had clear objectives which stimulated interest but some students found the library to be inadequate because of the absence of relevant books.



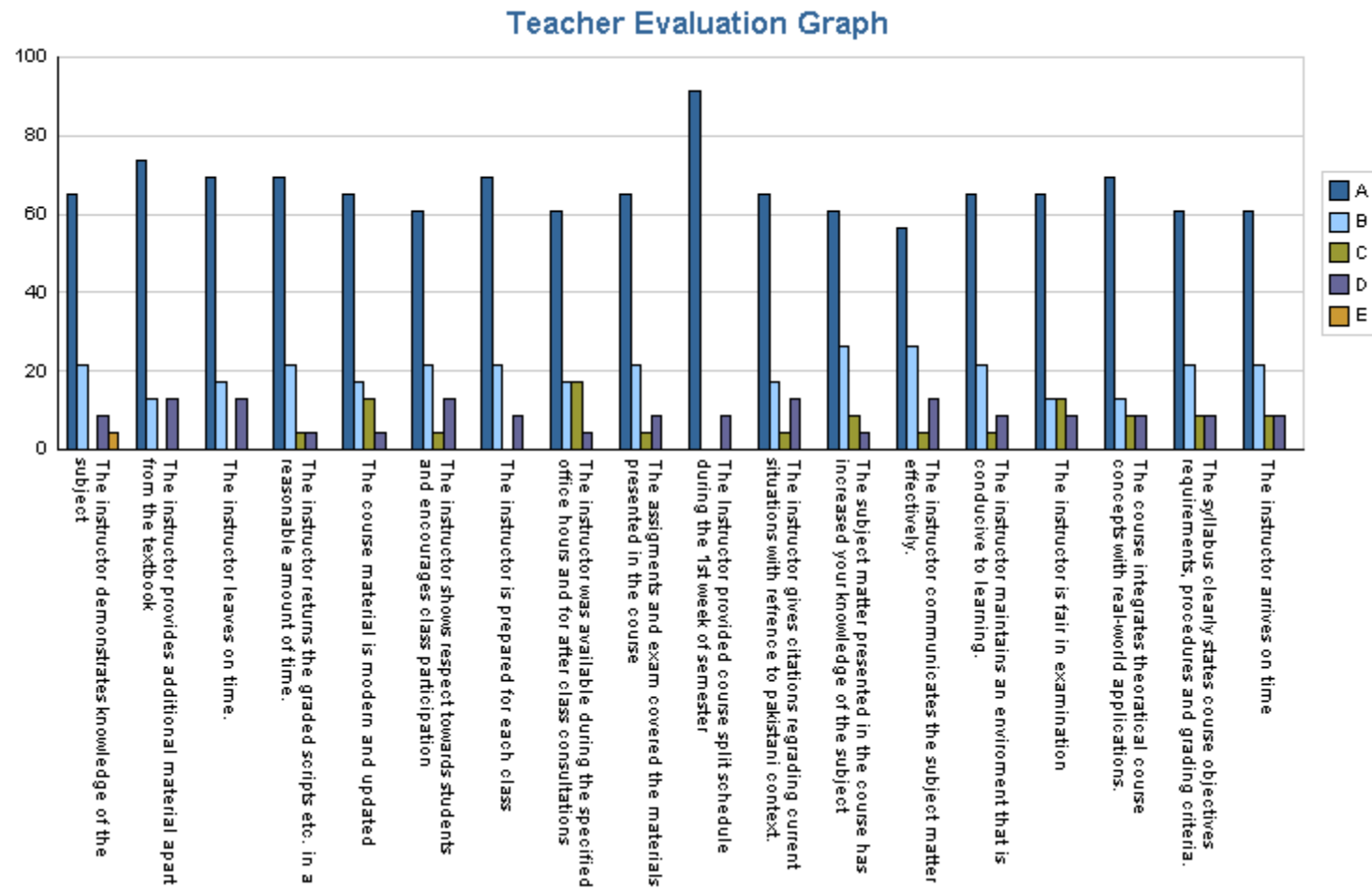
Results for course BCH-735 were very satisfactory as most of them agreed that course outcomes, learning resources, class environment, class participation, class attendance, pace, ideas and concept of course was satisfactory which stimulated interest in the course

2. Student Course Evaluation Spring Semester 2013:

2.1. Overall Results of Performa 10 of Ph.D. Courses

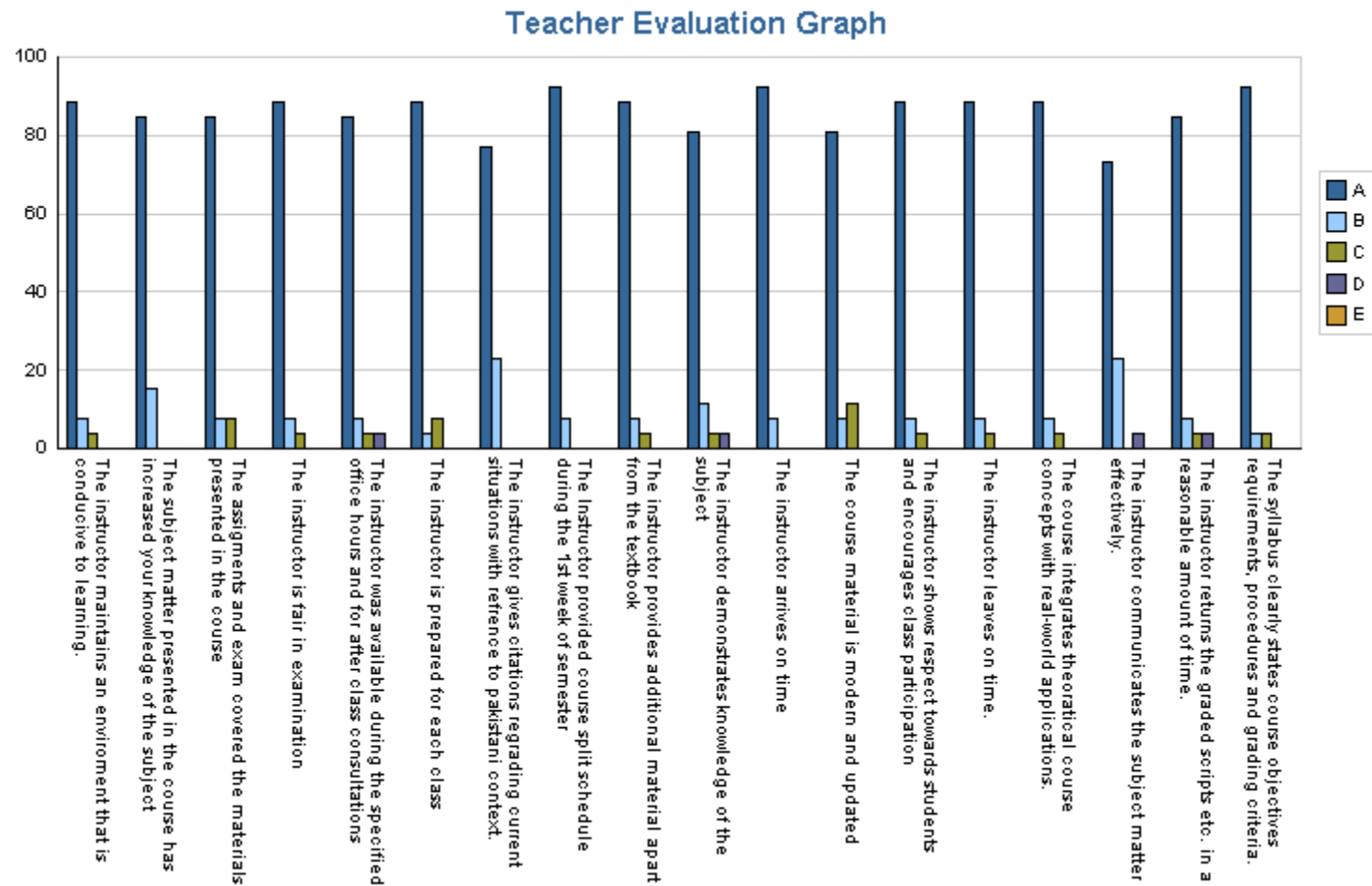
Students were directed to evaluate the courses taught in spring semester 2013 via performa no 1 and 10. The performa no.10 has been designed to get insight into the course effectiveness and usefulness. Six courses were taught to Ph.D students during spring 2013 which included BCH-736, BCH-724, BCH-720, BCH-731, BCH-733 and BCH-716. The results obtained are shown in graphs as follows;

Results of Performa 10 of Teacher 1 (BCH-736)



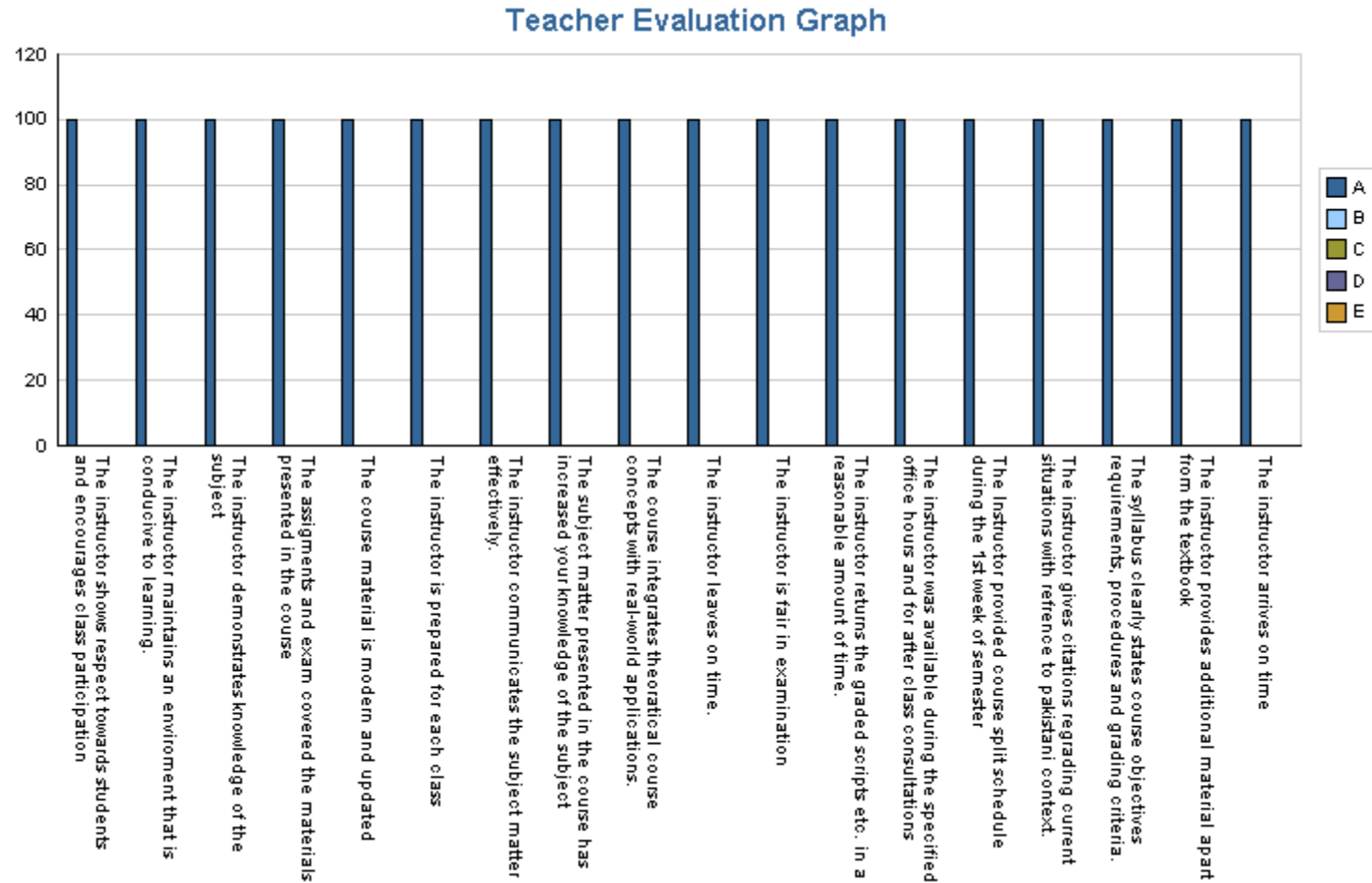
Students who took BCH-736 showed that they were provided with the split class schedule well in advance. The instructor had ample knowledge of the subject and the students problems were dealt effectively.

Results of Performa 10 of Teacher 1 (BCH-724)



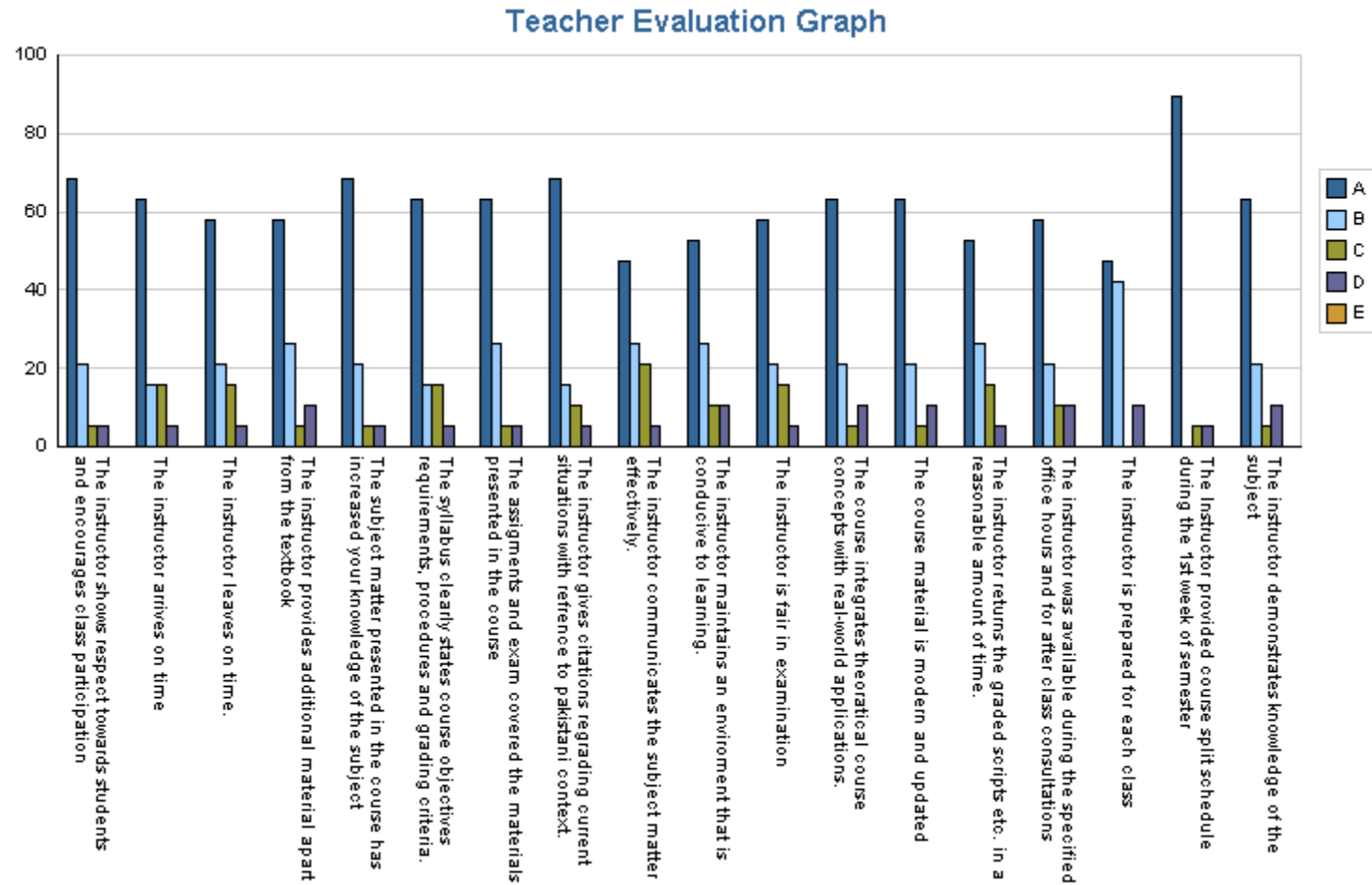
The strongest point about this course was its clear objectives and timely arrival of instructor in classroom.

Results of Performa 10 of Teacher 1 (BCH-720)



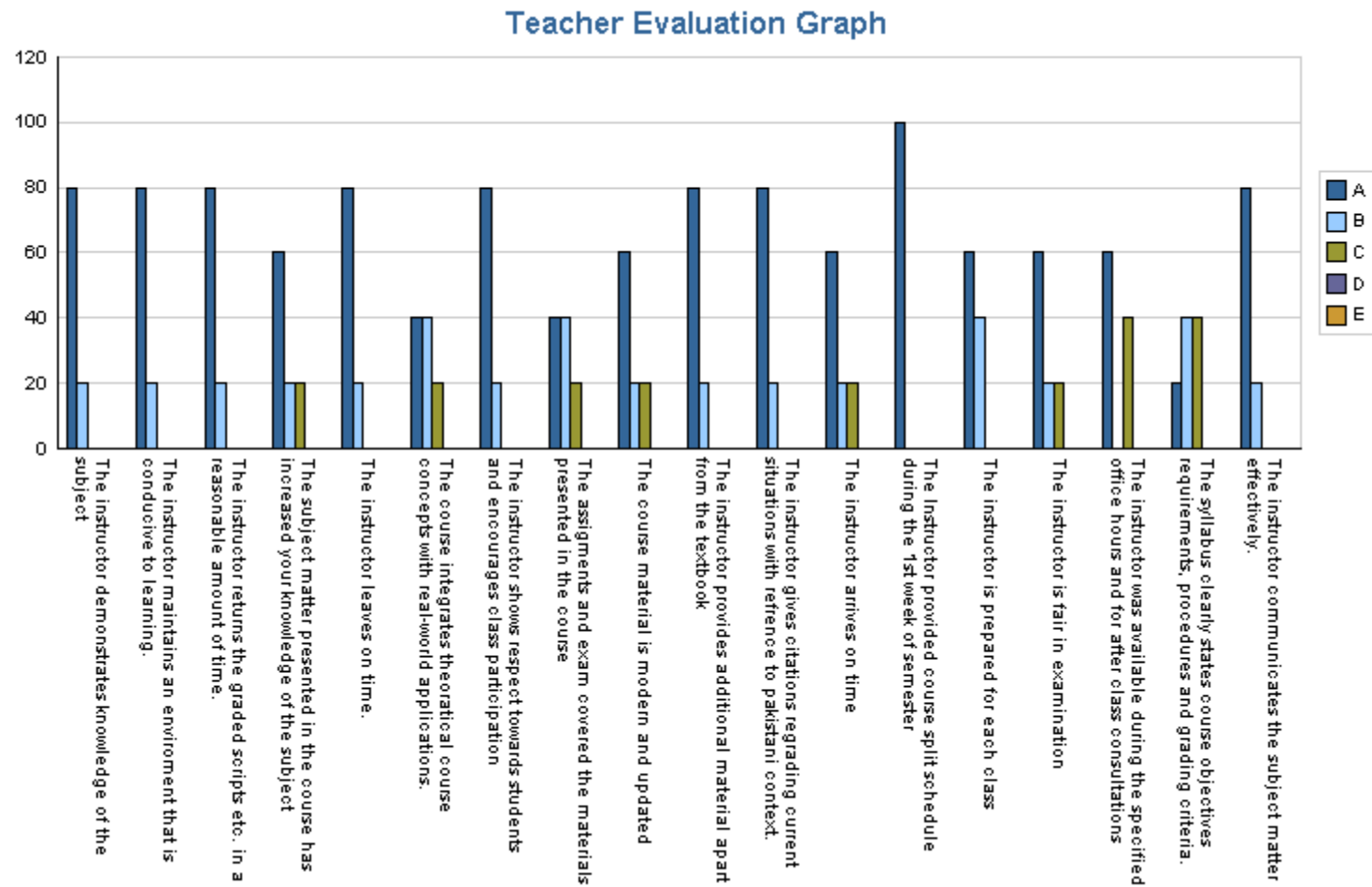
The students had full confidence on the effectiveness and usefulness of this course taken by teacher 1.

Results of Performa 10 of Teacher 2 (BCH-731)



The course had clear objectives and the students got split schedule in the first week of the semester.

Results of Performa 10 of Teacher 3 (BCH-733)

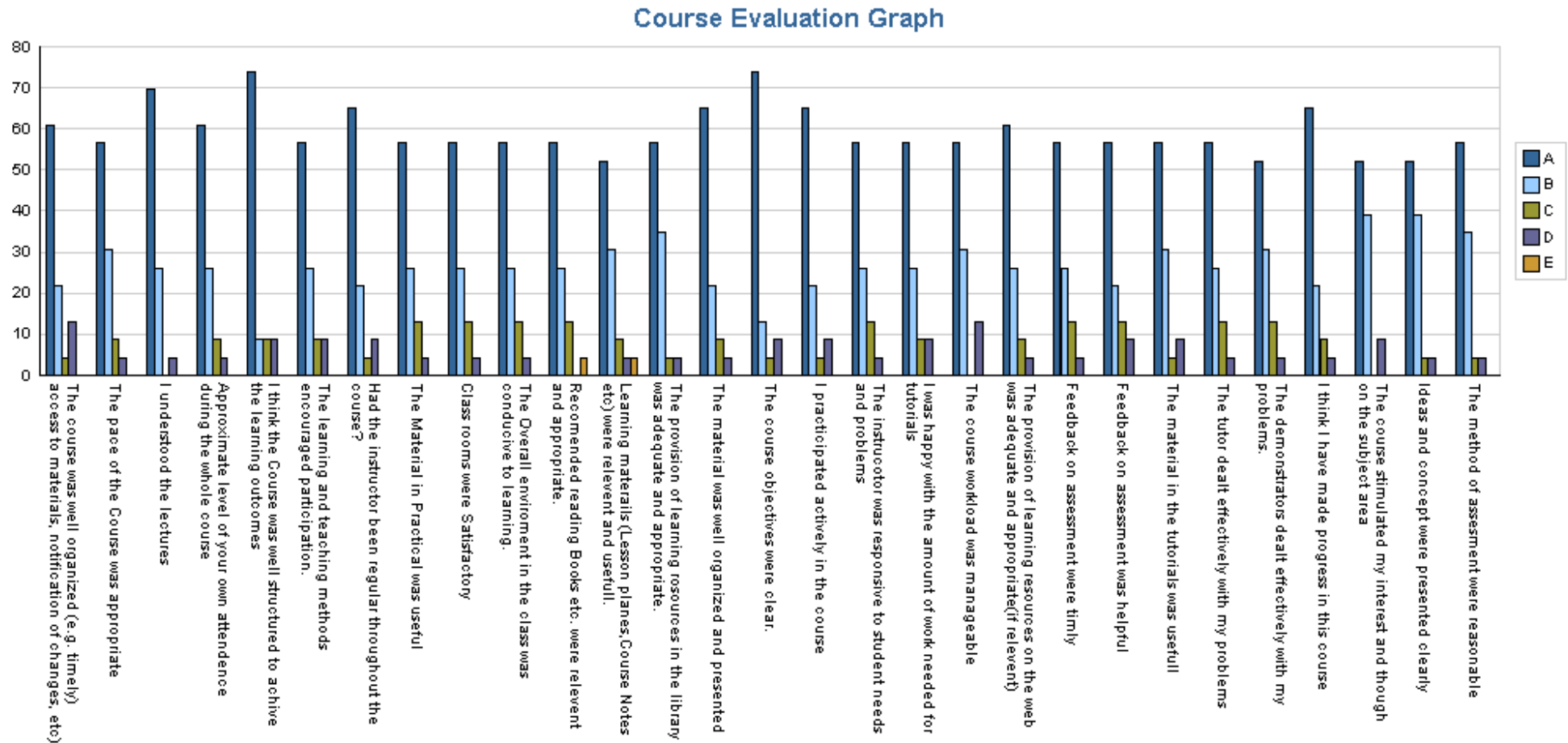


The instructor communicated on the subject matter effectively and showed respect towards the student and gave references to the current Pakistani situation.

2.2. Overall Results of Performa 1 of Ph.D. Courses

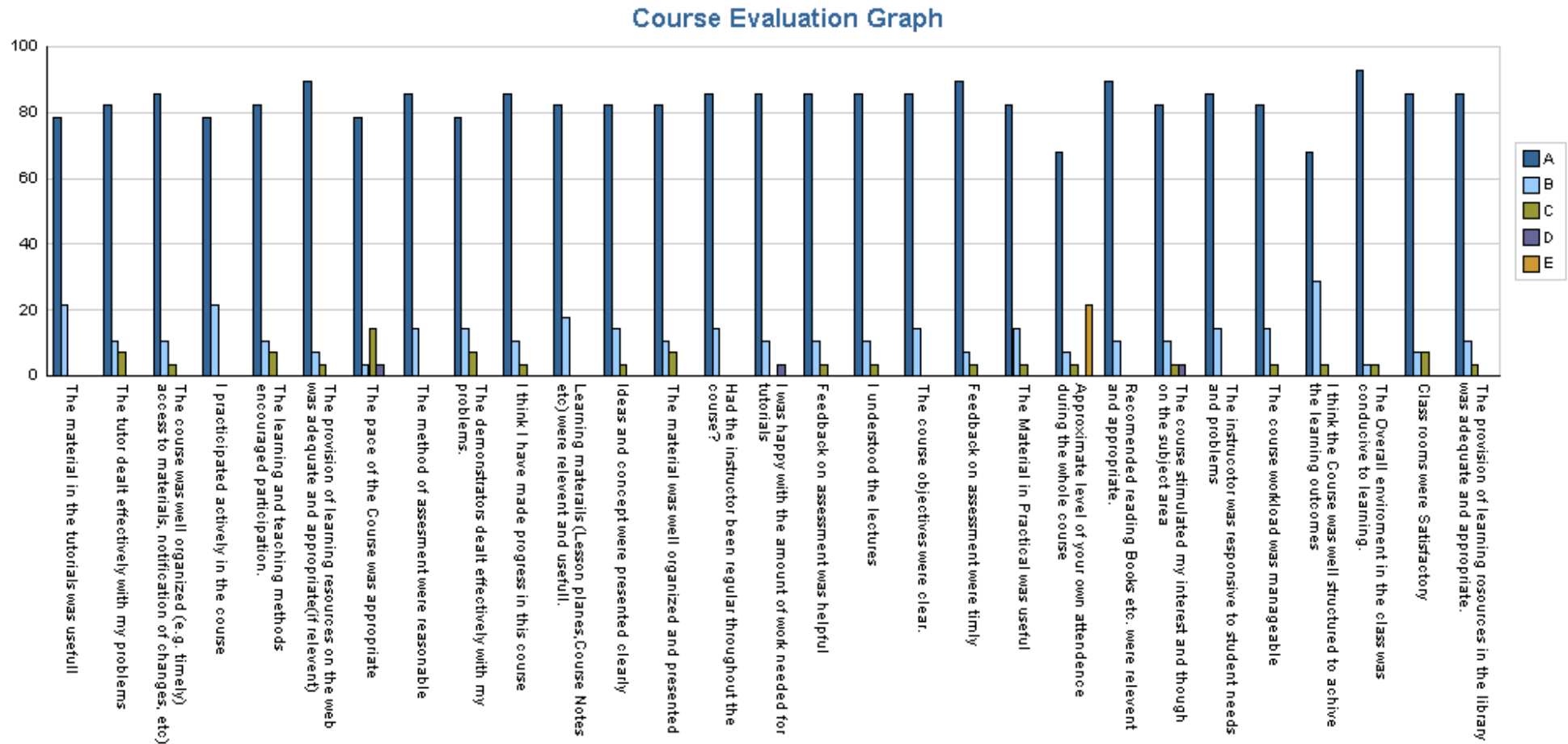
Confidential evaluation was carried out by students to give feedback regarding course instructor and his/her grip on the course content. Four teachers 1, 2, 3 and 4 taking six courses were evaluated and the results obtained were shown in graphs as follows;

Results of Performa 1 of Teacher 1 (BCH-736)



The performa results indicated that the course was well structured by the teacher which increased learning ability of the students as they understood the lectures.

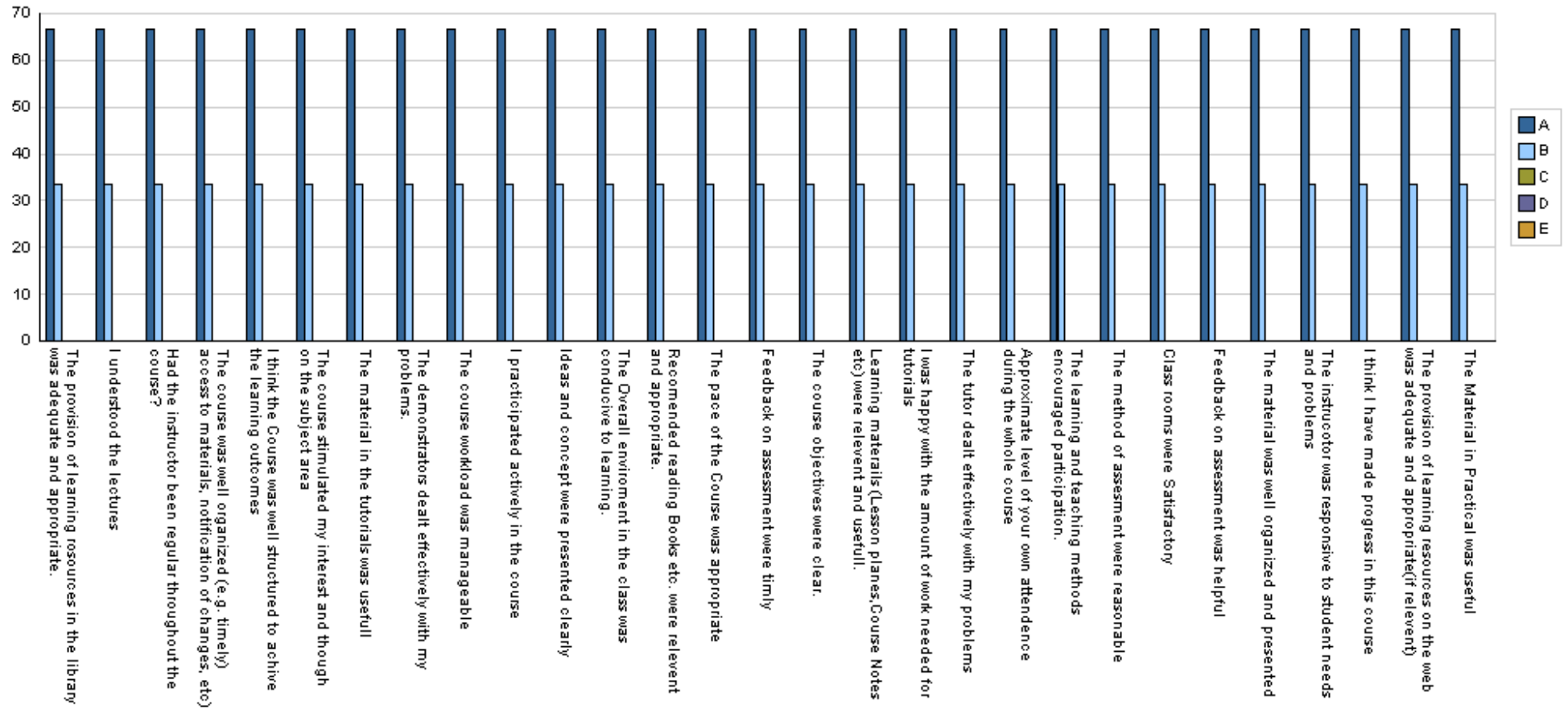
Results of Performa 1 of Teacher 1 (BCH-724)



The strongest point about this course is provision of learning material and the overall environment in the classroom was conducive to learning.

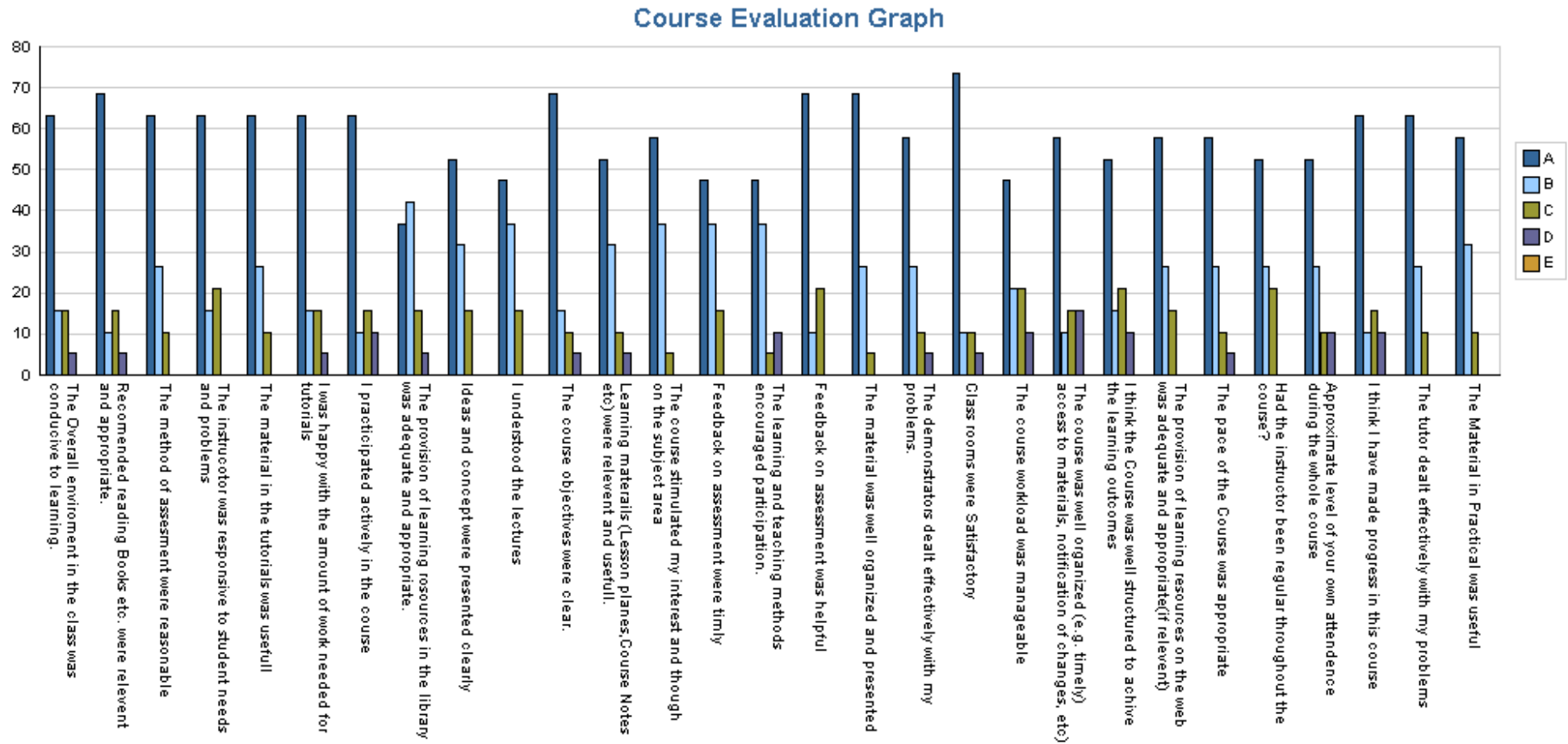
Results of Performa 1 of Teacher 1 (BCH-720)

Course Evaluation Graph



The students showed more than 65% satisfaction on the course instructor.

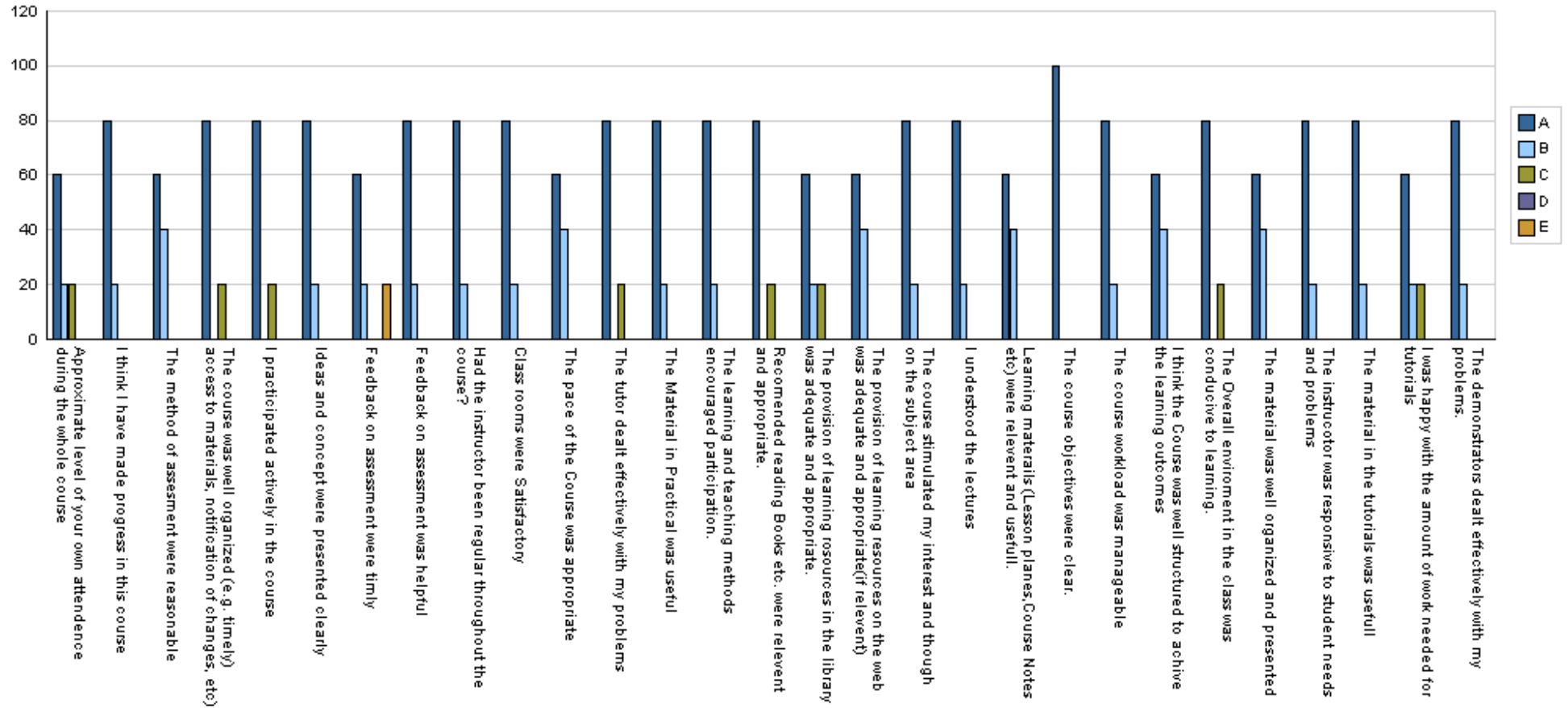
Results of Performa 1 of Teacher 2 (BCH-731)



The strongest point about BCH-731 taught by Teacher 2 is well organized course material and clear objectives.

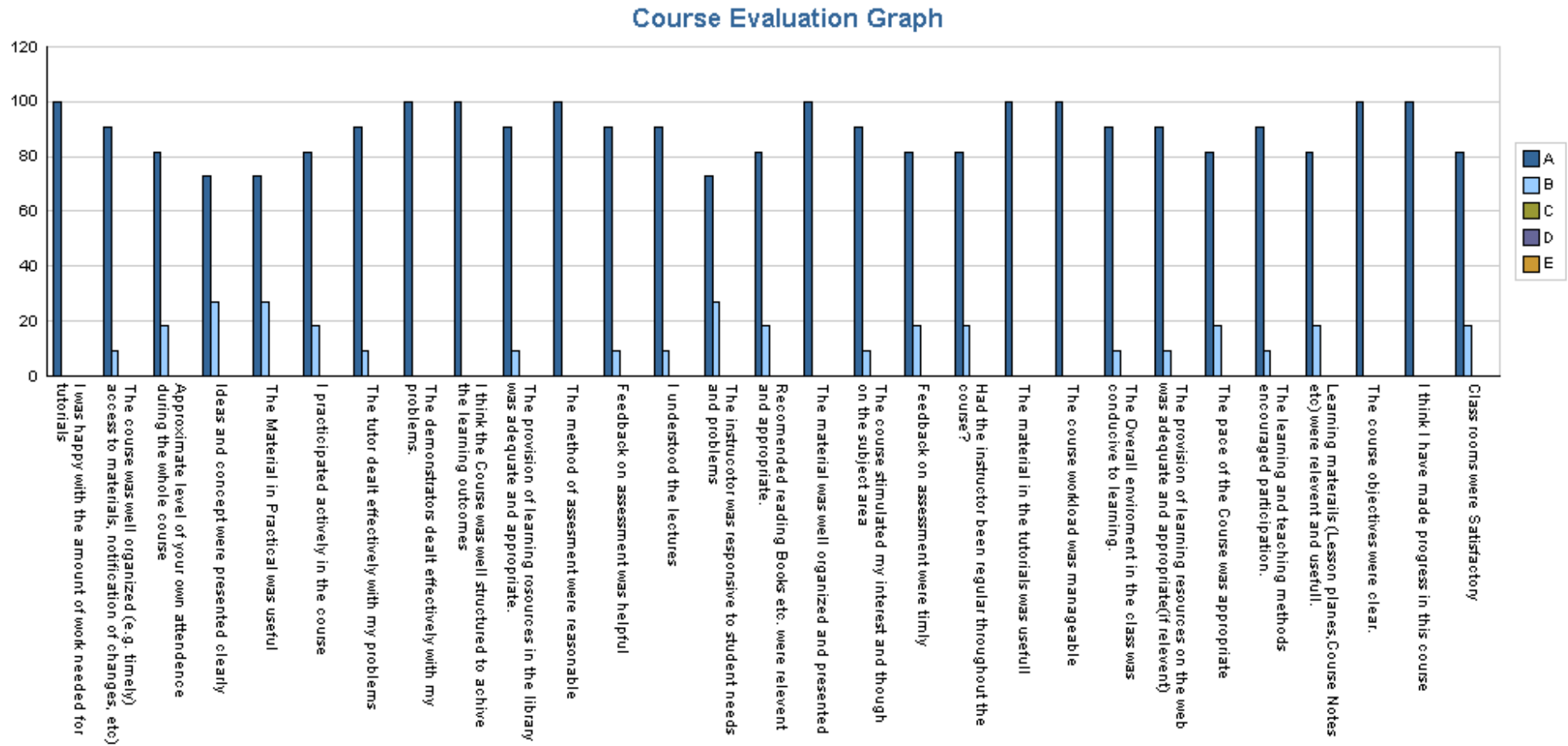
Results of Performa 1 of Teacher 3 (BCH-733)

Course Evaluation Graph



Teacher 3 dealt with the problems effectively and gave clear course objectives and the course was well organized.

Results of Performa 1 of Teacher 4 (BCH-716)



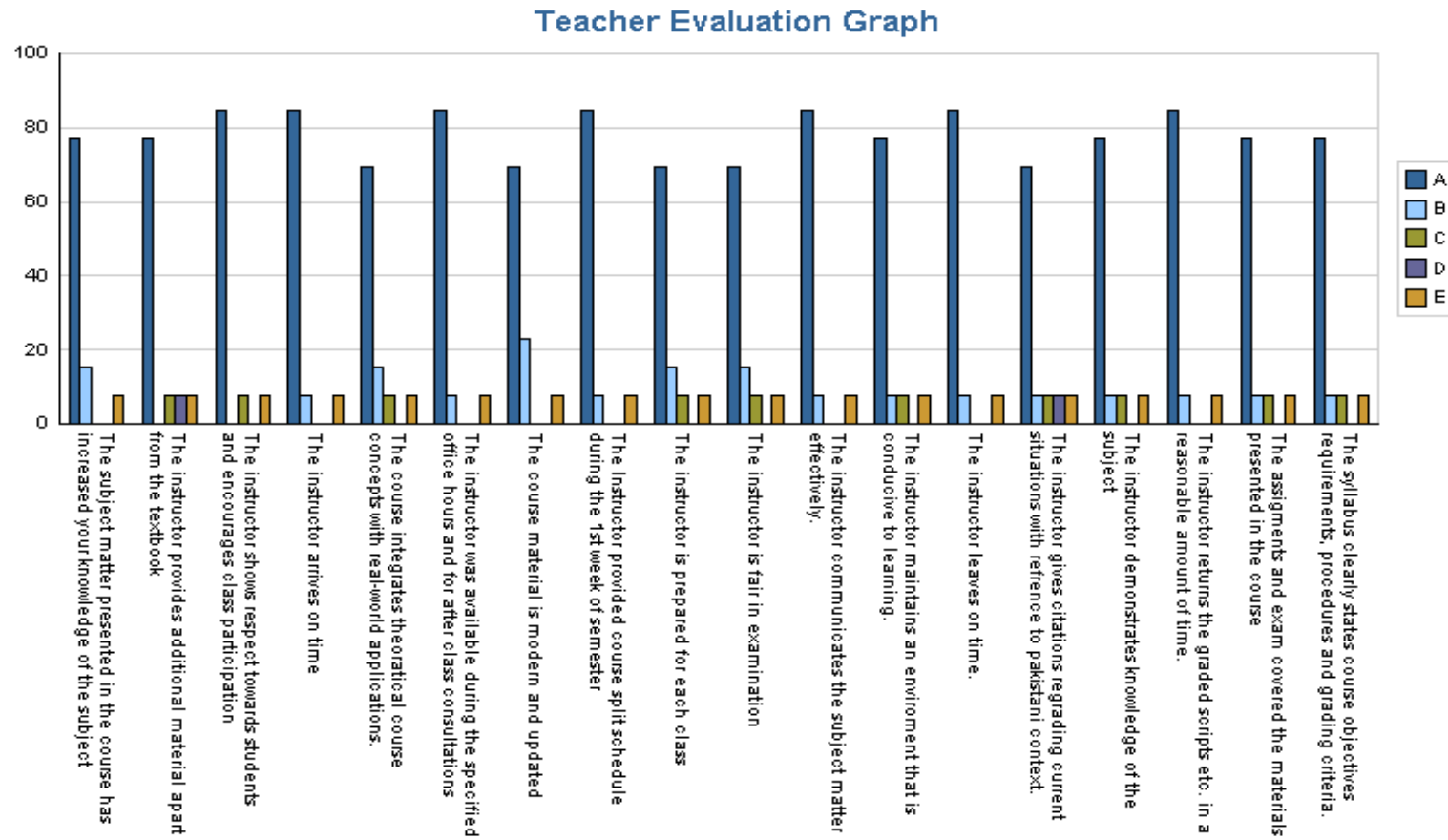
The students were happy with the amount of work needed for the tutorials and made progress in the course. Teacher 4 effectively handled the problems of students and showed respect towards them.

3. Student Course Evaluation Fall Semester 2013:

3.1. Overall Results of Performance of 10 of Ph.D. Courses

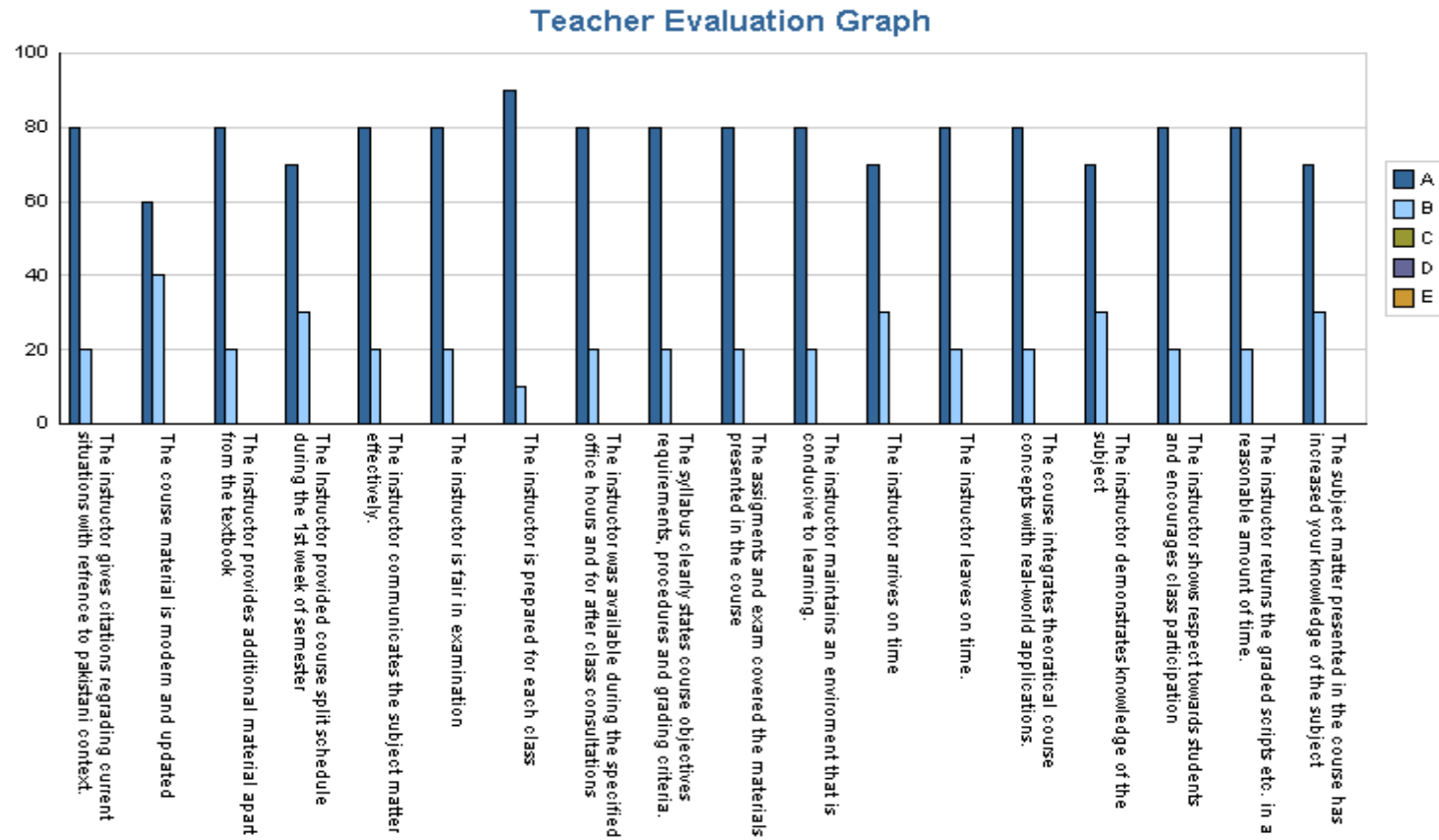
Upon completion of Fall semester 2013, online evaluation on university's website was done by students which increased the confidentiality and effectiveness of the process. Further, it also helped the SAR committee to effectively generate results on the available data. Ph.D students took the following four courses during the fall semester of 2013 which were taught by three teachers 1, 2 and 3; BCH-735, BCH-720, BCH-718 and BCH-732.

.Results of Performa 10 of Teacher 1 (BCH-735)



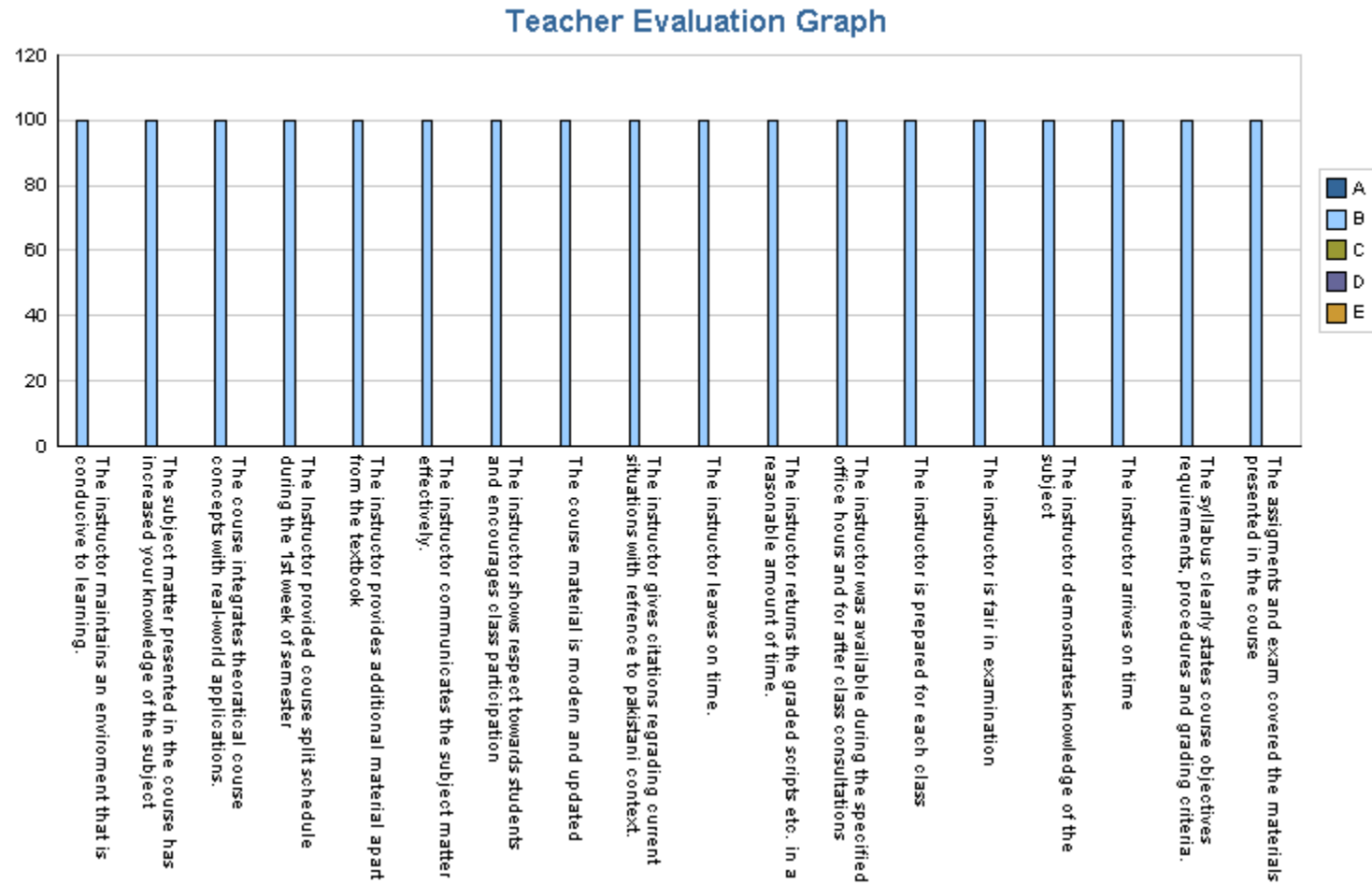
The strongest point about teacher 1 was timely return of graded script in the subject. The teacher was available in the specified office hour.

Results of Performa 10 of Teacher 1 (BCH-720)



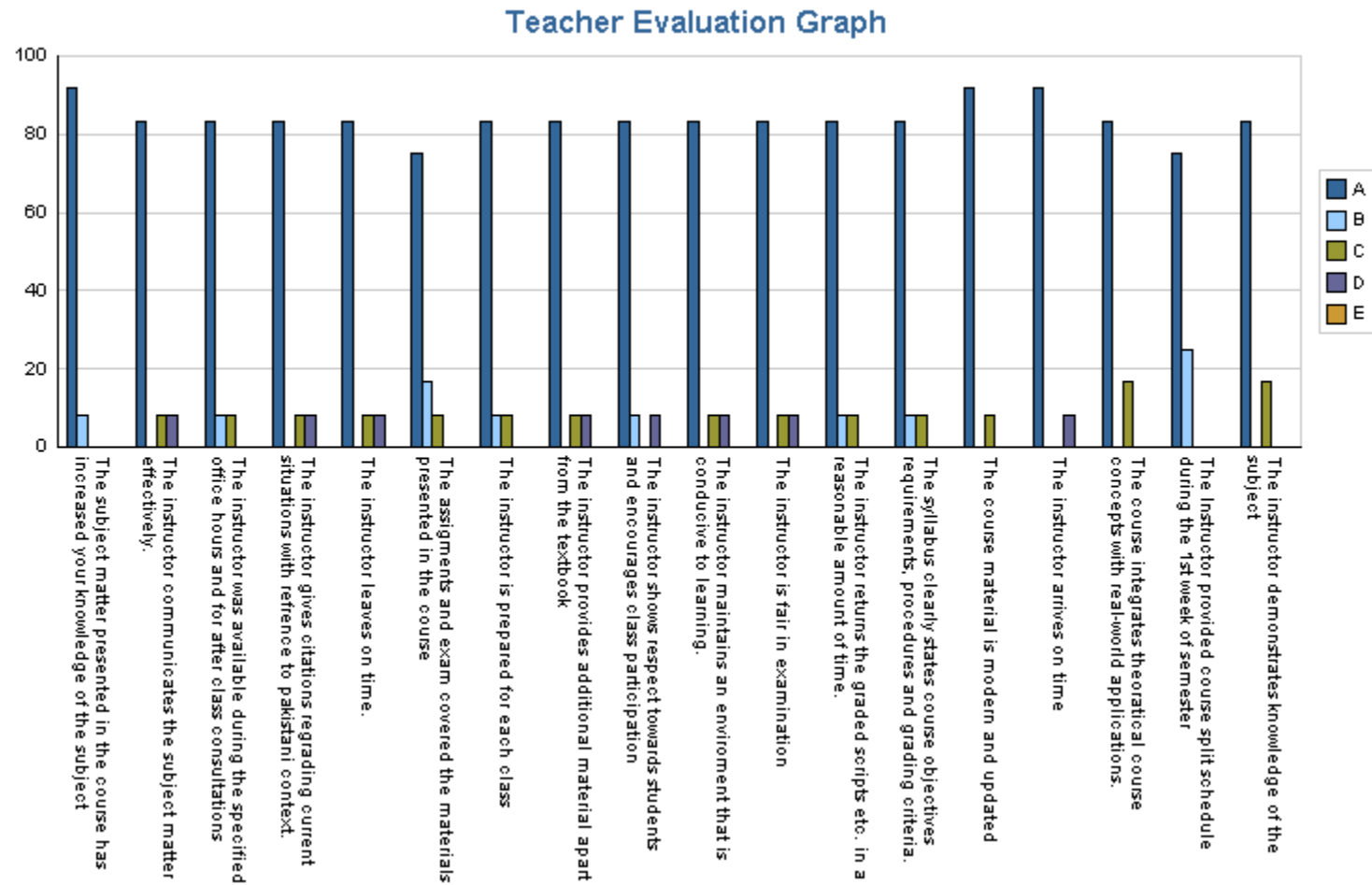
The teacher was prepared for the class and showed respect towards the students and encouraged class participation.

Results of Performa 10 of Teacher 2 (BCH-718)



Teacher 2 managed this course well as is evident from the evaluation by students. The teacher had been punctual and was prepared for each class.

Results of Performa 10 of Teacher 3 (BCH-732)



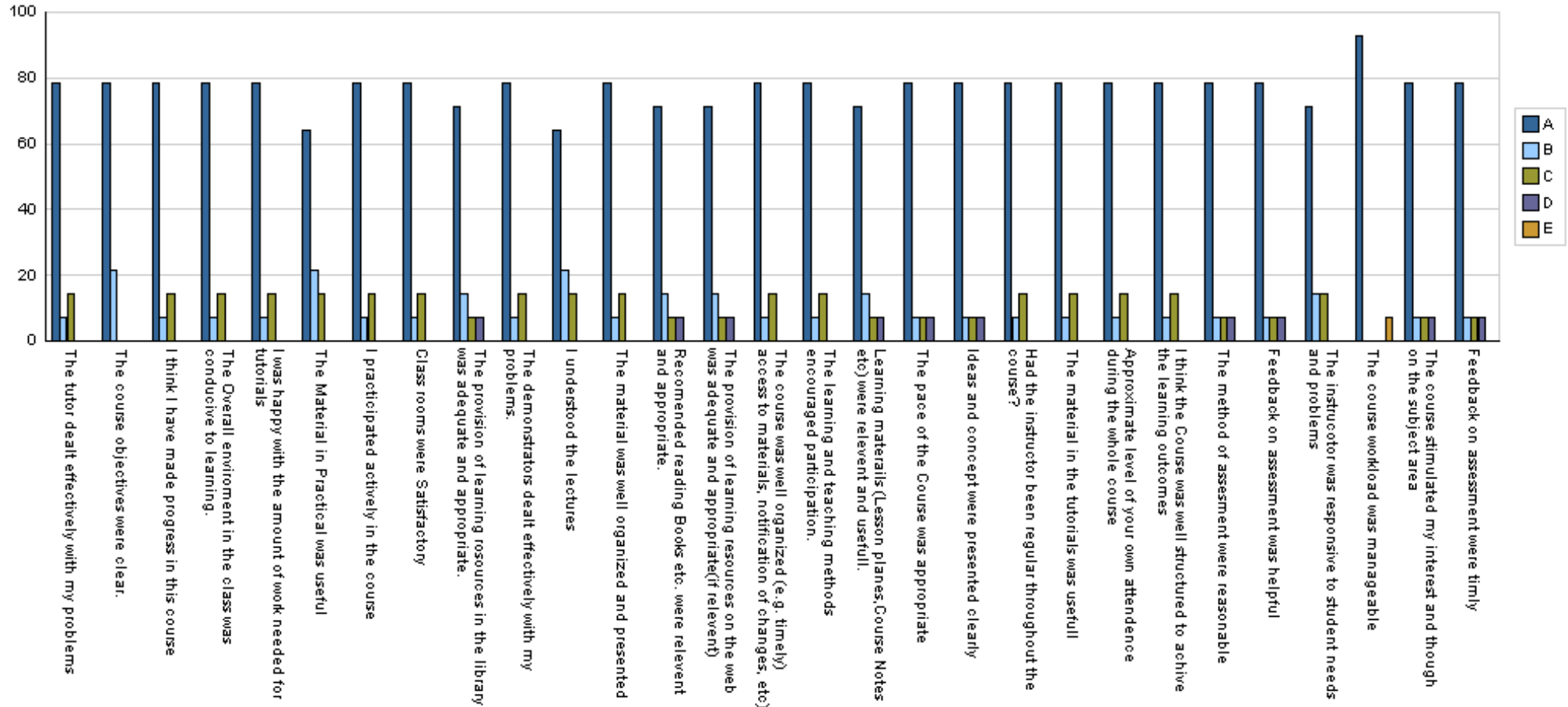
The strongest point about teacher 3 was providing the students modern and updated material.

3.2. Overall Results of Performa 1 of Ph.D. Courses

Performa No. 1 was evaluated by students of PhD and M.Phil. Three courses BCH-720, BCH-735, BCH-732 and BCH-718 were taught by three teachers 1, 2 and 3. The results obtained are as follows;

. Results of Performa 1 of Teacher 1 (BCH-735)

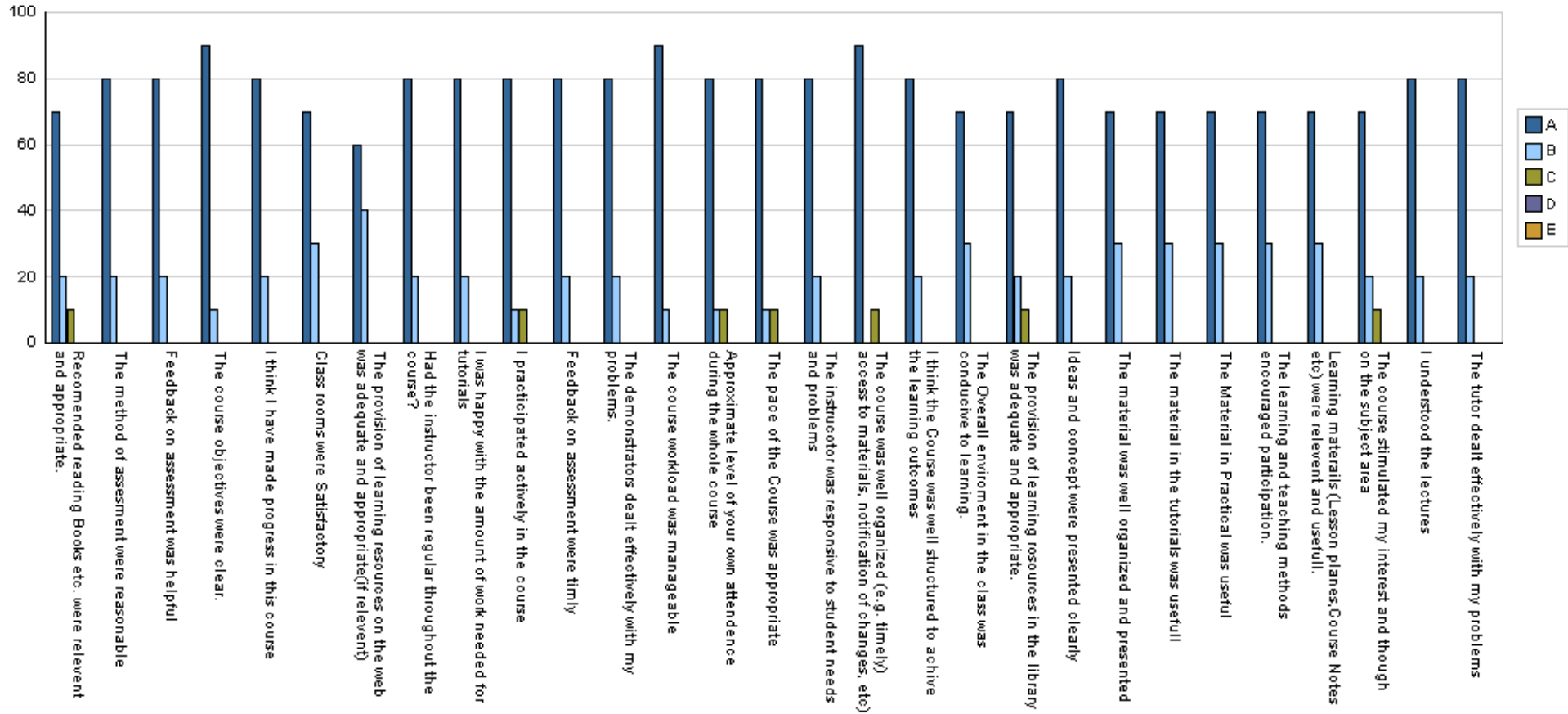
Course Evaluation Graph



The course was considered as a manageable course by >90% of the students. The overall response of students to all the parameters of performa 1 was highly satisfactory.

Results of Performa 1 of Teacher 1 (BCH-720)

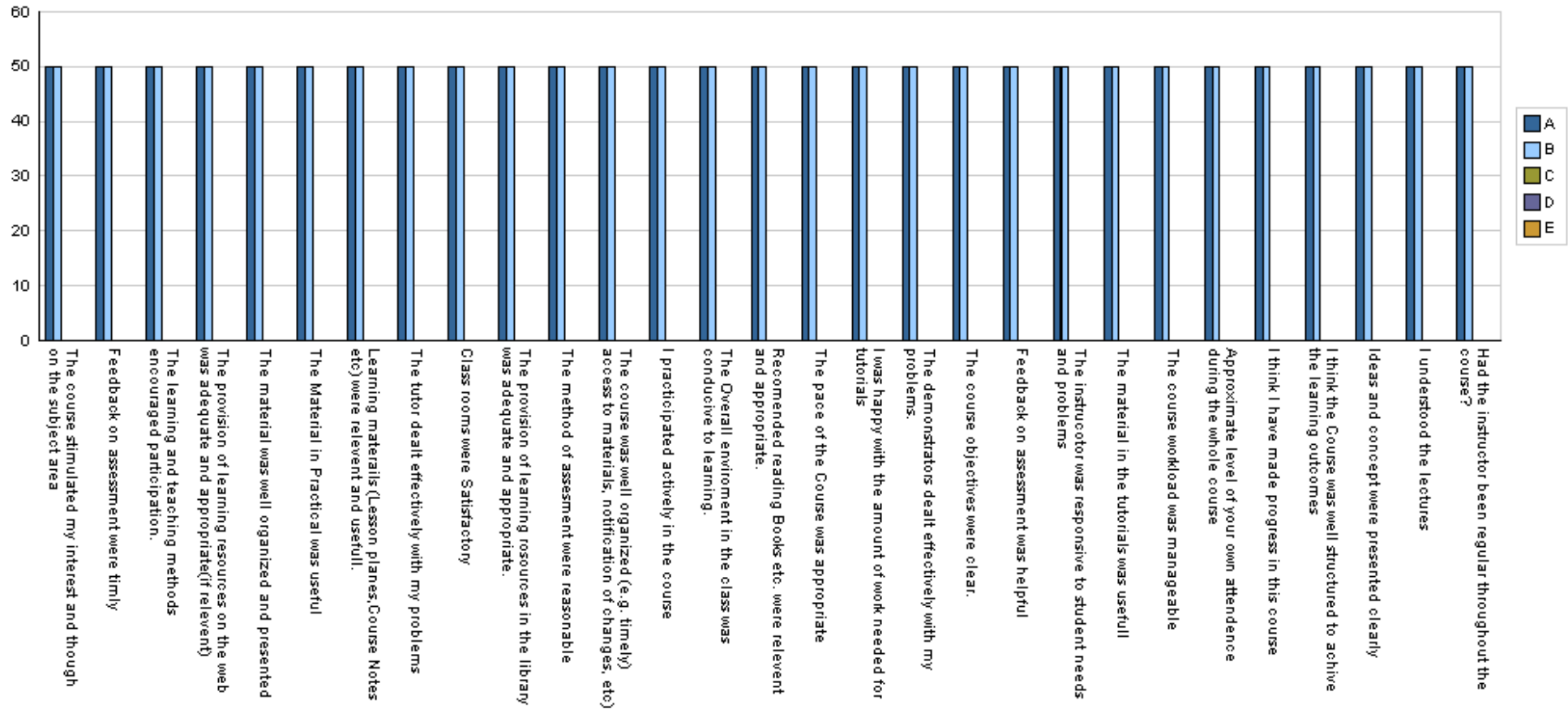
Course Evaluation Graph



BCH-720 is a Seminar course and the students agreed that the demonstrators dealt with their queries effectively.

Results of Performa 1 of Teacher 2 (BCH-718)

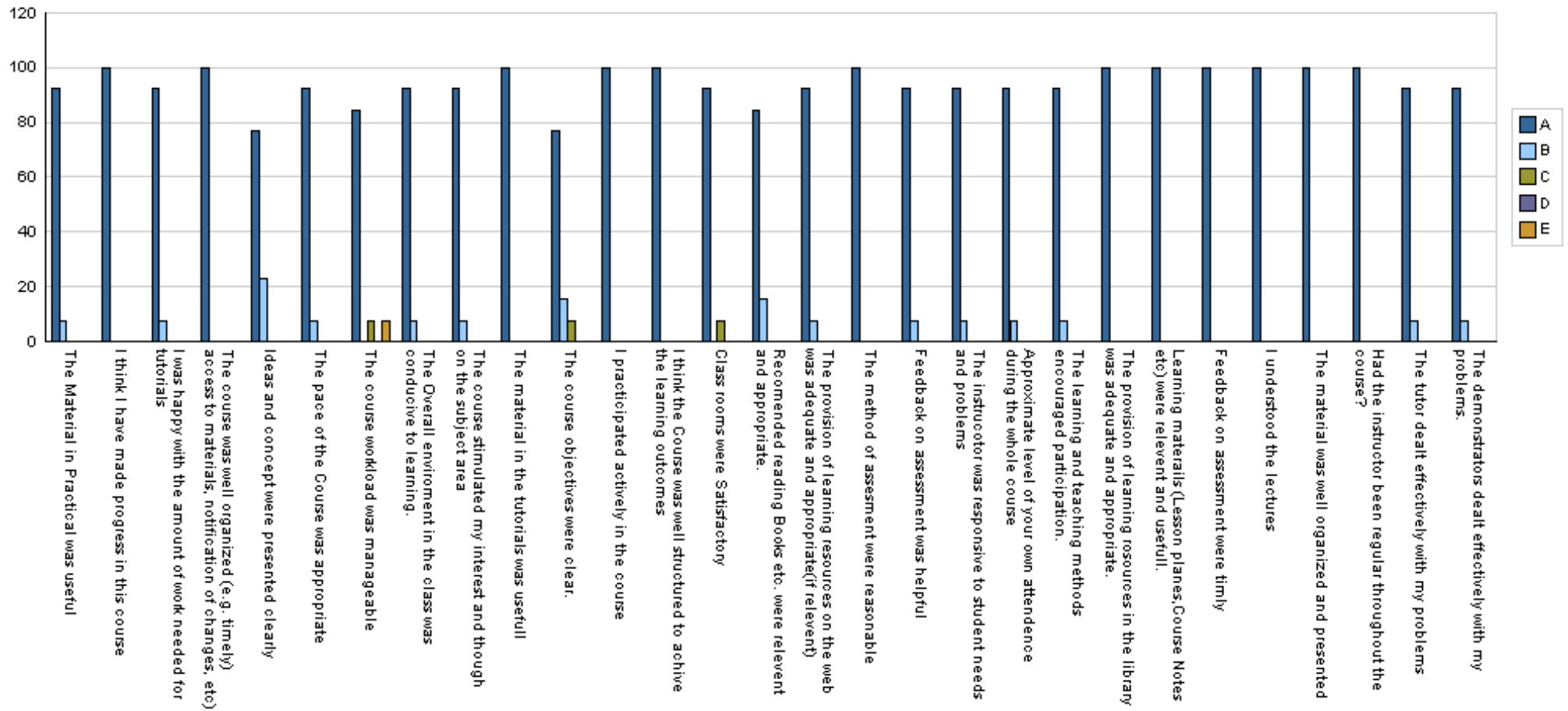
Course Evaluation Graph



BCH-718 had clear objectives and students understood lectures. The students made progress in this course and the demonstrator dealt with their problems effectively.

Results of Performa 1 of Teacher 3(BCH-732)

Course Evaluation Graph



The students had made progress in the subject by understanding the lectures and instructor was regular throughout this course.

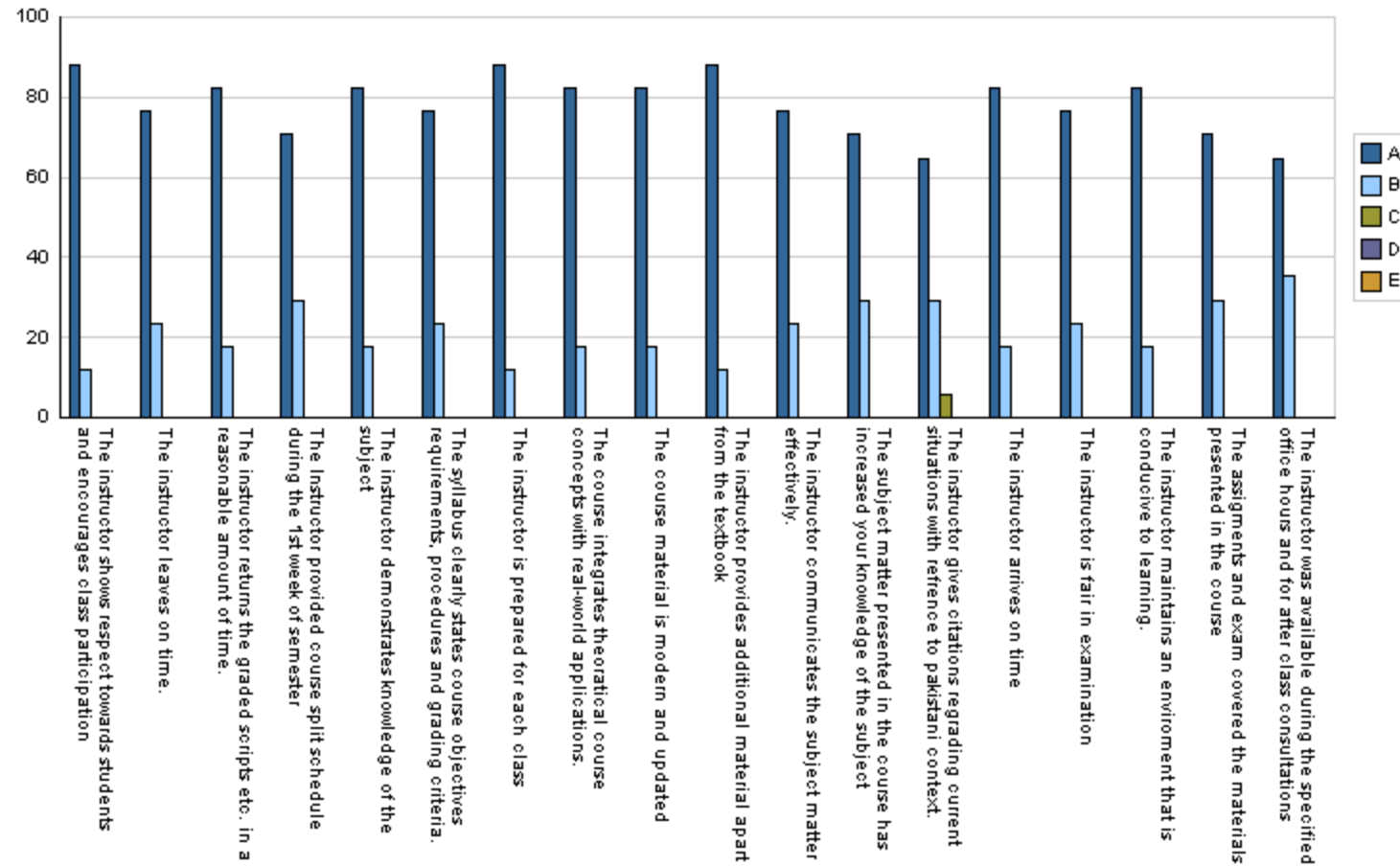
4. Spring Semester 2014

4.1. Overall Results of Performance 10 of Ph.D. Course Instructors

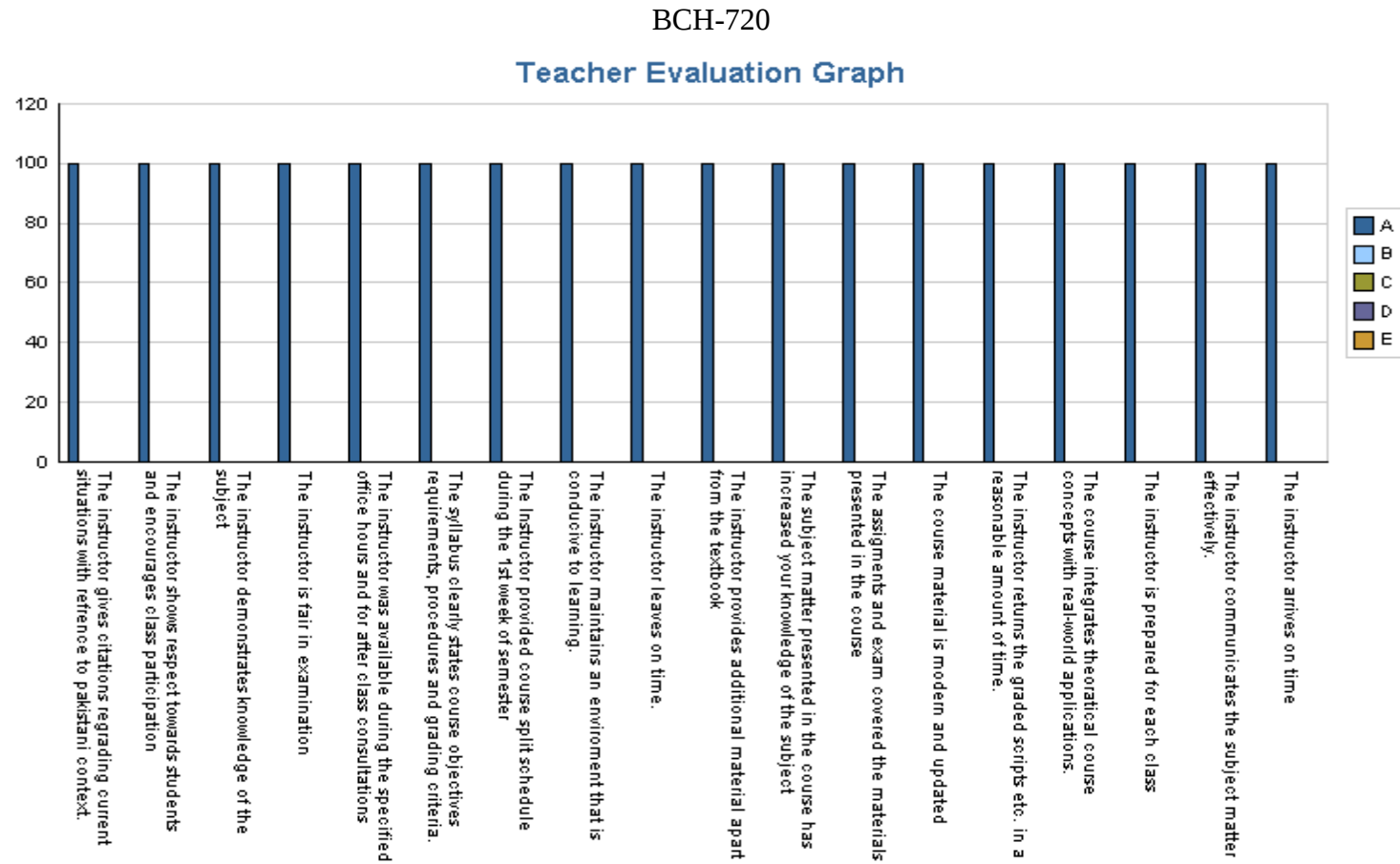
The teachers were evaluated by the students as per university rules at the end of the semester in accordance with Proforma-10. The evaluation was kept confidential and no identity of the evaluating student was revealed at any point to maintain the overall integrity of the evaluation procedure. In the upcoming section, the graphs obtained for each course instructor is discussed. The courses taught during spring semester, 2014 include BCH-731, BCH-724, BCH-733 and BCH-720 by four different teachers designated as Teacher 1, 2, 3 and 4 to M.Phil and Ph.D. students.

BCH-724

Teacher Evaluation Graph

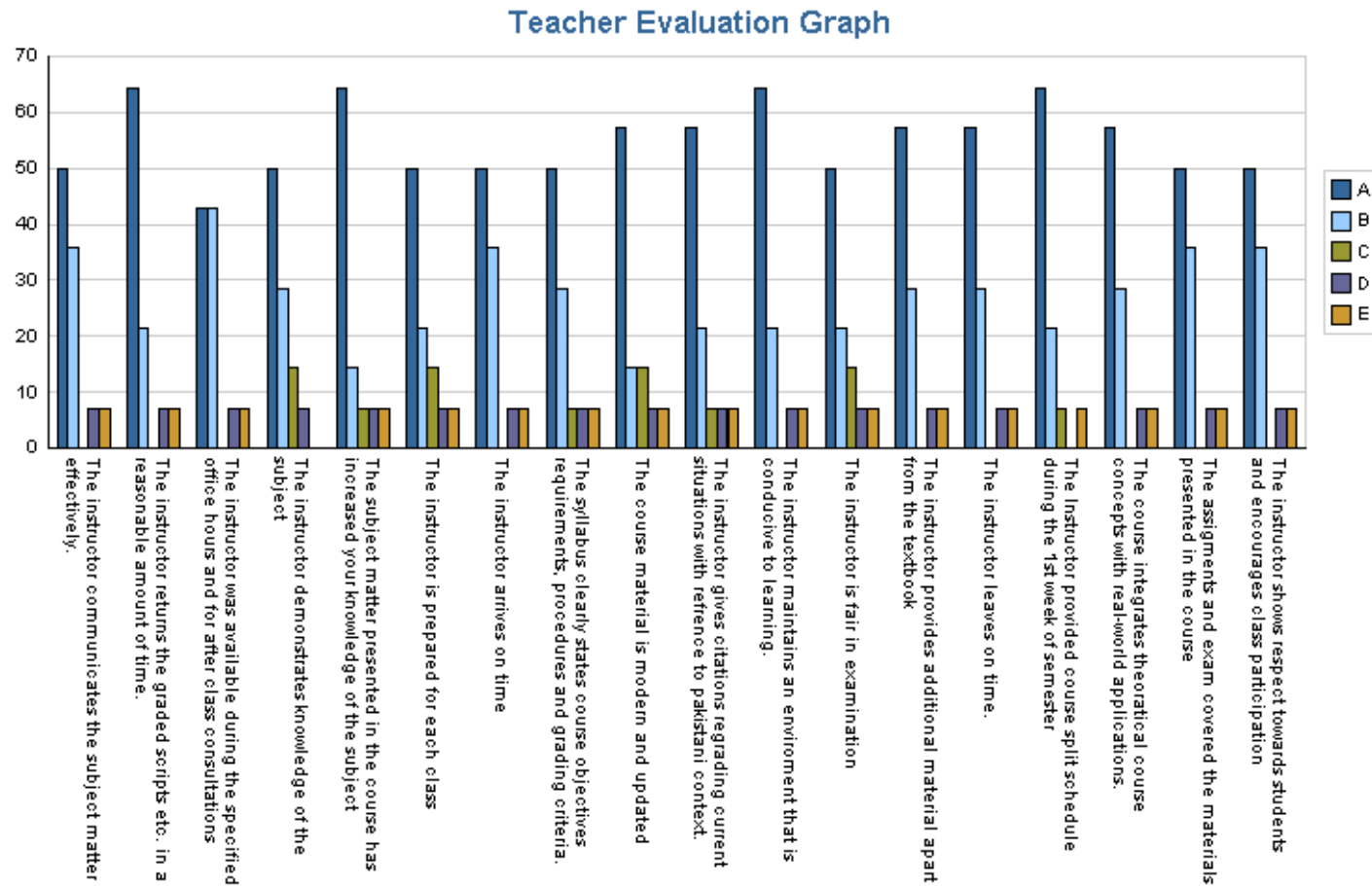


The respective course instructor was well prepared for the class and showed respect towards the needs of the students. He/She also provided additional reading material. Students also found fairness in examination/result as a very positive point. Overall more than 75% students gave highly satisfactory remarks.



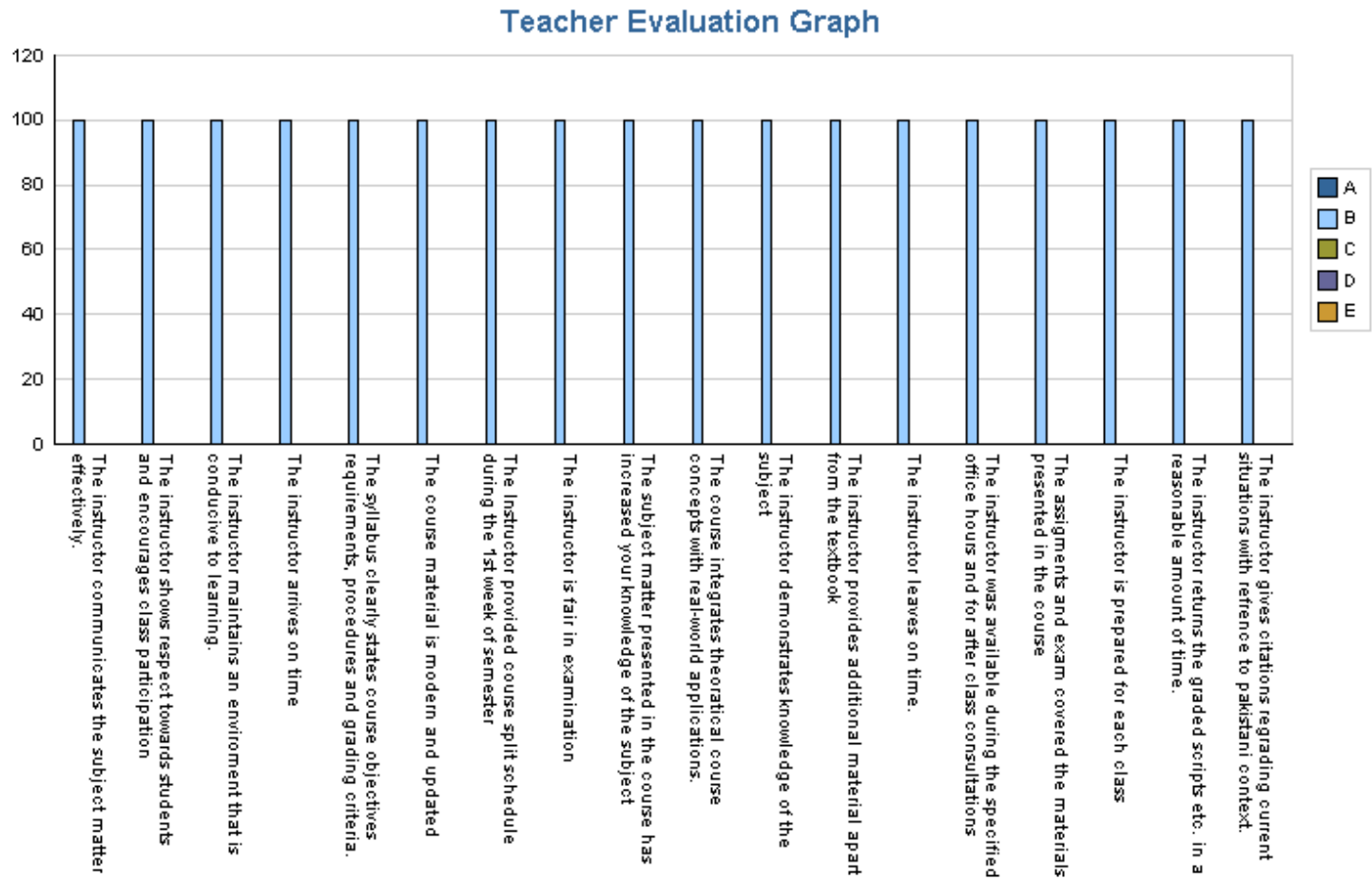
BCH-720 is a seminar course and the teacher 1 was taking care of this course. The students were exclusively highly satisfied with the teacher as He/She was fair in assessing the capabilities of the participating students.

BCH-731



Students were satisfied over the timely return of graded assignments and provision of the related reading material by the Teacher 2. They also found that the instructor dealt effectively with their issues and they gained knowledge by attending this course.

BCH-733



Teacher 3 got overall satisfactory views of the students taking BCH-733 course in the morning.

4.2. Student Course Evaluation Spring Semester 2014:

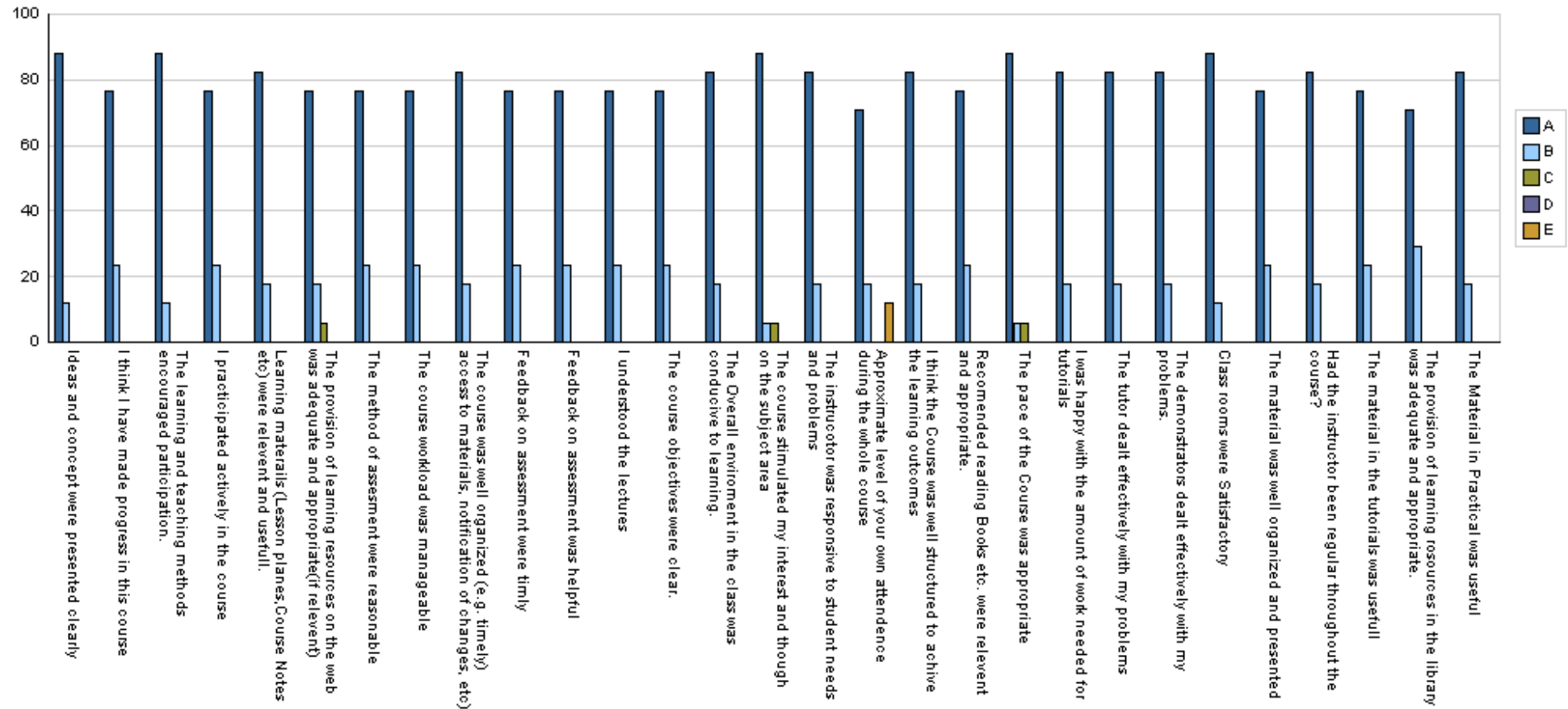
Over all Results of Proforma No. 1

Performa No. 1, deals with study of course observation regarding design of course contents (both theoretical and practical), its relevance with subject and teaching material. It also emphasizes on instructor's role in, not only completing course within given time frame, but how' instructor developed student's interest in this course, used updated literature and was fair in evaluation at the end of a study course. This feedback helps in improving the course material, contents, etc. So, It is important to ensure that assessment is being used for improvement of the degree programs being offered by the department/university.

Following are the results of performa no 1 for Ph.D. courses taught by four teacher in the spring session 2014.

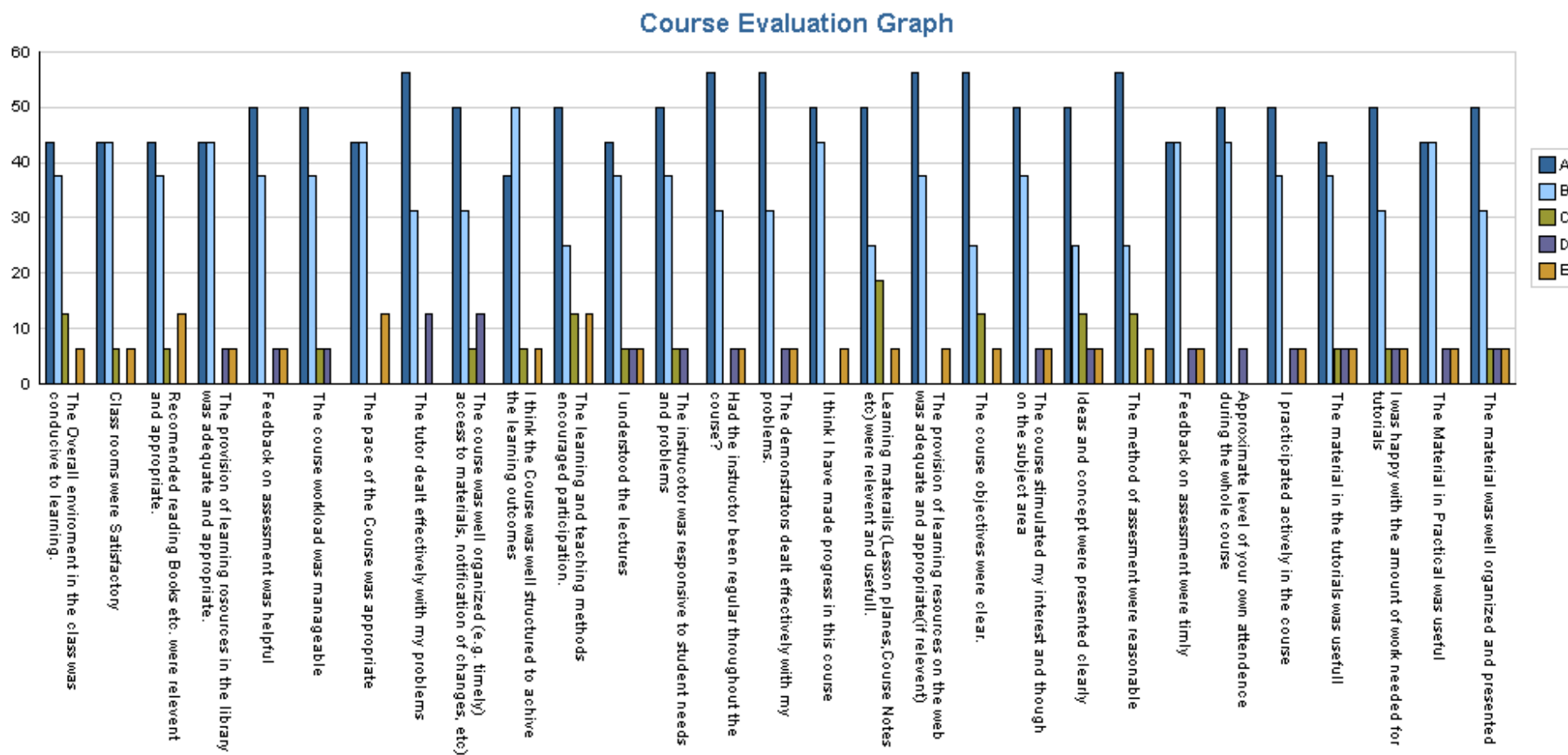
BCH-724

Course Evaluation Graph



Depending upon the results of Performa.1, the Teacher 1 was found regular in the class and the teacher stimulated the interest of the students in the course.

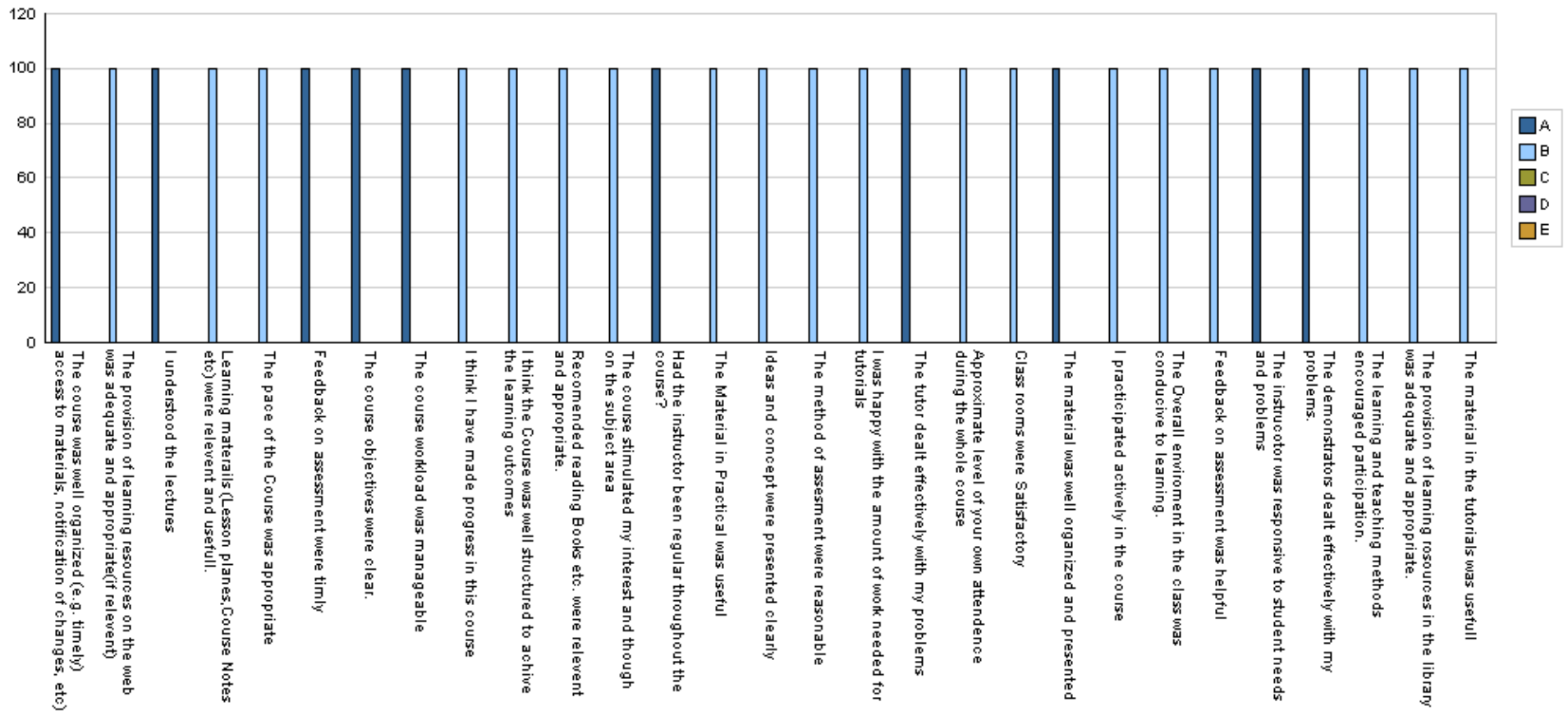
BCH-731



Students were highly satisfied with the course instructor's ability to deal with the problems effectively and the method of assessment. The students also considered the course organization and the teaching aid satisfactory which encouraged them to participate in the class.

BCH-733

Course Evaluation Graph



Students showed 100% high satisfaction over the course organization and objectives, understanding of the lecture, feedback, regularity, response and problem dealing capabilities of the course instructor, which was followed by 100% satisfaction on the rest of the performance questions.

Skills and Capabilities Reflected in Performance as Biochemistry:

Students developed ability to apply both theoretical and practical knowledge of Biochemistry. This ability will help them to work as professional biochemists in various fields of life, to build confidence and communicate effectively in writing, oral and demonstration by using modern tools, techniques and skills for their profession, to formulate and design the experiments/project and to work effectively in a team, to manage different problems and imbibe ability to recognize future needs in the field of Biochemistry which will also contribute in the development of nation.

Standard 1-3

Strength of the Department:

The department of Biochemistry has state of the art, fully equipped laboratories with latest instruments/chemicals including Multiplex, PCR thermocyclers, DNA nanodrops, RT-PCR, Biolistics, HPLC, Fermenters, Plant tissue culture chambers etc. However, the main strength of the department is its highly qualified and skilled faculty, with full acquaintance of their respective subjects including plant, animal/human, environmental biotechnology and general biochemistry which covers all aspects of Biochemistry, Molecular Biology and Biotechnology. All of the faculty members have foreign research experience. They have successfully completed many National/International research projects and are remarkably active in the academic and research fields.

Weakness Identified in the Program:

Although the faculty and laboratories are outstanding for the production of quality graduates but they are not sufficient. The Department of Biochemistry has not been upgraded to University Institute of Biochemistry and Biotechnology (UIBB) yet and so there is shortage of regular faculty members. The existing faculty is over-burdened due to their heavy workload in teaching and related departmental duties. Another important issue is lack of full time qualified technicians/supporting staff. Therefore, scientific research activities (both personal research projects as well as student theses projects) are being handicapped. Besides, access to scientific literature has also been inconsistent due to regular problems in internet. Above all, the department is under extensive financial constraints due to limited annual budget compared to the seven degree programs being offered with increasing student enrollments.

Major Future Improvement Plans:

- Initiation of M.Phil and PhD Biotechnology and BS Microbiology programs.
- Strengthening graduate, post graduate and postdoctoral programmes in Biochemistry, Biotechnology and Bioinformatics.
- Up-gradation of research by integrating biochemistry, biotechnology and bioinformatics into existing traditional systems.
- To emphasize biochemical and molecular approaches for *in vitro* techniques in plant and animal biotechnology.
- Developing human resource for highly advanced fields of biochemistry, biotechnology and bioinformatics to play a crucial role in national development.

**TABLE-3: QUANTITATIVE ASSESSMENT OF THE DEPARTMENT
(2012-2014)**

Sr. #	Particular	No.	Remarks
I	M.Sc produced	157	M.Sc. Graduates from the Department are working in public as well as private sector in research, teaching, diagnostics, pharmaceuticulas, chemical and equipment supplies. Many ex-students have joined M.Phil. and Ph.D. programs in PMAS-AAUR, QAU, PU & UAF
Ii	M.Phil	102	Working in public as well as private sector in research, teaching, diagnostics, pharmaceuticulas, chemical and equipment supplies or pusuining PhD.
Iii	Ph.D.	11	In employment
Iv	Post-Doc fellowship by faculty	5	USA, UK, Sweden and Canada
	Short Term Training	3	
V	Students: Faculty ratio	25:1	
Vi	Technical : Non Technical ratio	2:8	

Faculty

Table-3.1: Faculty Distribution in Biochemistry

Name	Position	Qualification	Specialization
Dr. S.M.Saqan Naqvi	Professor	Ph.D., Post-Doc	Molecular Biology/ Biotechnology
Dr. M.Gulfraz	Professor	Ph. D. Post-Doc	Biochemisry/Natural Product Chemistry
Dr. Ghazala Kakub Raja	Associate Professor	Ph. D. Post-Doc	Biochemistry/ Molecular Biology
Dr.M.Javaid Asad	Assistant Professor	Ph. D, Post-Doc	Industrial/Fermentation Biotechnology
Dr. M.Sheeraz Ahmad	Assistant Professor	Ph. D, Post-Doc	Biochemistry/Plant Biotechnology
Dr.Feroza H. Watoo	Assistant Professor	Ph. D., Post-Doc	Biochemistry
Dr. Azra Khanum	Professor/ Research Consultant	Ph. D., Post-Doc	Biochemistry/Biotechnology
Dr. Pakeeza A. Shaiq	Assistant Professor	Ph.D.	Human Molecular genetics

Standard 1-4

TABLE- 4.1: PRESENT PERFORMANCE MEASURES FOR RESEARCH ACTIVITIES

Faculty	Journal Publications (National & International) (Year 2012-2014)	Conference Publications (Proceedings/ Abstract) (Year 2012- 2014)	On-going Projects (Year 2012- 2014)
Prof. Dr. S.M. Saqlan Naqvi	12	06	2
Prof. Dr. M.Gulfraz	30	05	02
Dr. Ghazala Kaukab Raja	11	07	02
Dr.M.Javaid Asad	08	02	-
Dr. M.Sheeraz Ahmad	07	04	1
Dr. Feroza H. Wattoo	08	02	-
Dr. Pakeeza A. Shaiq	06	02	1
Total	82	28	08

The department is well established and its distinguishing feature is the availability of all expertise (Molecular Biology, Plant Biotechnology, Environment Biotechnology and Enzymology).

The Department is providing following community Services:

To enhance the quality and quantity of scientific trainings, the Department has organized the workshops and seminars. The basic aim is also to provide a forum for knowledge/information exchange between academic disciplines and raising general awareness about Biochemistry and Biotechnology. Under guidance of the Worthy Vice Chancellor, the department has established state of the art laboratory for food and water testing.

Faculty Satisfaction Regarding the Administrative Services:

- The department maintains a ratio of 25:1 and 2:8 for the student: teacher and technical: non-technical staff respectively.
- Administrative meetings (departmental, university, academic council, and syndicate) are attended and when required. Generally two meetings of academic council are held per year. Board of studies of the department meets quarterly.
- Quick office disposal; no complaint pertaining to delay has ever been received from authorities.
- Proper records of individuals, students and their theses are maintained.

CRITERION 2: CURRICULUM DESIGN AND ORGANIZATION
Degree Title: PhD. (Biochemistry)

Intent:

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

Definition of Credit Hour:

A student must complete a definite number of credit hours. One credit hour is one hour theory lecture or two hours laboratory (practical) per week. One credit hour carries 20 marks. A semester is of 18 weeks.

Presently following are details of PhD program:

Credit Hours					
Degrees	Min. Course Hrs	Thesis	Duration (in Semesters)		Passing CGPA
			Min	Max	
Ph.D.	18	50	8	10	3.00

Pre-requisites

Minimum Academic Requirements:

A person holding M.Sc. in Biochemistry or equivalent degree from any recognized institute with at least second division or overall 45 % marks is eligible to get admission in M.Phil. A student have M.Phil degree and 65 % GAT subject will be eligible for admission in PhD.

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

Degree Requirements:

Degrees are awarded after completing the required number of credit hours (courses). Minimum Grade Point Average for obtaining the degree 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	1.50
Second	1.75
Third	2.00
Fourth	2.50

Examination & Weight-age:**a) Theory**

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

Mid Examination	30%
Assignments	10%
Final Examination	60%

b) Practical

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

Eligibility for Examination:

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

The minimum pass marks for each course are 40 % for M.Phil. while 50% for Ph.D.

Standard 2.1: Assessment of the Biochemistry Curriculum

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

TABLE-7: CURRICULUM VS PROGRAMM OUTCOME

Course/Group of Courses	Outcomes				
	1	2	3	4	5
BCH-718,BCH-719,BCH-720,BCH-721,BCH-722,BCH-723,BCH-724,BCH-725,BCH-726,BCH-727,BCH-728,BCH-731,BCH-732,BCH-733,BCH-734,BCH-735,BCH-736 and BCH-751	XX	XXX	XX	X	XX

x	=	Satisfactory
x x	=	Relevant & satisfactory
x x x	=	Very relevant & satisfactory
x x x x	=	Highly relevant & highly satisfactory

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

Standard 2-2: Theoretical backgrounds, problem analysis, solution design given as under

Meeting Standard 2-2: Percentage of Elements in Courses

Elements	Courses
Theory only	718,BCH – 719,BCH – 720, BCH – 721,BCH – 722,BCH – 723,BCH – 724, BCH – 725,BCH – 726,BCH – 727,BCH – 728, BCH – 731,BCH – 732,BCH – 733,BCH – 734, BCH – 735,BCH – 736, BCH-751
Theory + Practical	BCH – 721, BCH – 724,BCH – 727,BCH – 728

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

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

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

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

Standard 2-7: Enhancing Oral and Written Communication Skills of the students

- Two seminars carrying one credit hour each at M.Phil. and Ph.D. level are compulsory .
- Students are assigned to present generally the recent status/ status on various global and local issues/problems.
- Assignments are given to M.Phil & Ph.D. students on specific titles (part of the course) which are submitted as written report, to increase their writing skills.

Criterion 3: Laboratories and Computer Facilities

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

1. Plant Biotechnology Labs
2. Animal Biotechnology Labs
3. General Biochemistry Labs
4. Enzyme Biotechnology Labs
5. Bioinformatics lab

- Location: UIBB, PMAS-AAUR
- Objectives: Laboratories are used for: Research work for the graduate and post-graduate students. For implementing the projects funded by the University, HEC, PSF, PARC and other agencies.
- Shortcoming: Laboratories are reasonably equipped, spacious and adequate, however ACs are not installed in all labs.
- Safety Regulations: Fire extinguishers and first aid kits are available. The University also maintains a Medical Dispensary for such incidents.

Standard 3-1: Laboratory Manuals:

Laboratory manuals for each subject are available. The departmental library has all the relevant books. However, teachers also have their own books to prepare the relevant practicals.

Standard 3-2: Support/Laboratory Personal for Maintenance of Laboratory

Two Lab Assistants are available to maintain laboratory, equipments, glassware, chemicals, materials etc. Three laboratory attendants assist the students in practicals, cleaning and washing.

Standard 3-3:

Computing Infrastructure and Facilities

- **Computing facilities support:** Most of the faculty members and the post graduate students have computer facility available.
- **Shortcoming in computing infrastructure:** Wireless internet facilities should be available to all faculty members and postgraduate students in class rooms and laboratories.
- **Safety Arrangements: There are proper safety arrangements and security plan is available in case of emergency.** In newly constructed UIBB building; there is no emergency exits for the labs and fire safety system is not available.

Criterion 4: Student Support and Advising

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

Standard 4-1: Frequency of Courses

- Courses are taught as per policy at the University/Academic Council.

- Elective courses are offered as per policy of HEC and the University.
- For post graduate programs, a variety of courses are offered according to demand of the profession.

Standard 4-2: Structure of the Courses

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

Standard 4.3: Guidance to the students

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

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

Criterion 5: Process Control

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

Standard 5.1: Program Admission Criteria

- The process of admission is well established and followed as per rules and criteria set by HEC and the University. For this purpose an advertisement is published in the National News Papers and university website by the Registrar Office.
- Admission criteria for M.Phil in Biochemistry is M.Sc. (Biochemistry) or equivalent with CGPA not less than 2.5 and for PhD is M.Phil (Biochemistry) or equivalent with minimum CGP 3.00.
- Admission criteria are revised whenever needed.

Standard 5.2: Process of Registration

- The student file, after completion of the admission process, is forwarded to the Registrar Office for proper registration in the specific program and the registration number is issued to the student.

- Students are evaluated through Mid, Final and Practical exams and through Assignments.
- Registration is done for one time for each degree but evaluation is done through the result of each semester. Only those students who fulfill the criteria of the University, they are promoted to the next semester.
- In general, the students are registered on competition bases keeping in view the academic and research standards.

Standard 5.3: Recruiting Process for Faculty

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

- Vacant and newly created positions are advertised in the national newspapers, applications are received by the Registrar office 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 Vice Chancellor and alternate candidates are selected.
- Selection of candidates is approved by the Syndicate for issuing orders to join within a specified period.
- Induction of new candidates depends upon the number of approved vacancies.
- Standards set by HEC are followed.
- Tenure Track System (TTS) recommended by HEC has been adopted by the University.
- HEC also supports appointment of highly qualified members as foreign faculty Professors, National Professors and deputes them in concerned departments of the University.

Standard 5.4: Teaching and Delivery of Course Material

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

Standard 5.5: Completion of Program Requirements

- The controller of examinations announces the dates of commencement of examination. After each semester, the controller office notifies the results of the students. The evaluation procedure consists of quizzes, mid and final examinations, practicals, assignments/reports, oral and technical presentations. The minimum pass marks for each course is 40% for undergraduate and Master degree and 50 percent for PhD.
- In theory, weight age 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 M.Phil. students who secure highest marks. Degrees are awarded to the students on the annual convocation that is held every year.

CRITERION 6: FACULTY

Standard 6-1: There must be enough full time faculty who are committed to the program to provide adequate coverage of the program areas/courses with continuity and stability. At present there are Four Lecturers (on Contract), Two Assistant Professors, Two Associate Professors and Two Professors in the Department of Biochemistry who are teaching in different degree programs. There is a need of highly qualified Faculty members to share the burden of teaching and research.

Table 7: FACULTY DISTRIBUTION BY PROGRAM AREAS IN BIOCHEMISTRY

Program area of specialization	Number of faculty members in each area
Plant Biotechnology	3
Animal Biotechnology	3
Enzyme Biotechnology	2
General Biochemistry	2

Standard 6-2: The interests and qualifications of all faculty member must be sufficient to teach all courses, plan, modify and update courses and curricula.

The interest of all Faculty members is not sufficient to meet the requirement of all the courses taught to the M.Sc program.

Standard 6-3: All faculty members must have a level of competence that would normally be obtained through graduate work in the discipline.

The majority of the faculty must hold a Ph.D in the discipline

- At present all faculty member (except for lecturers, on contract) in Biochemistry are Ph.D degree holders in relevant discipline.
- All lecturer are M.Phil and two out of three are completing their PhD degrees.

Standard 6-4: The majority of the faculty must hold a Ph.D in the Discipline

- At present all faculty members are Ph.Ds except for three lecturers (under UIBB contract).

Standard 6-5: Faculty members dedicate sufficient to research to remain current in their discipline

- All members are dedicated to research and supervising M.Phil and PhD research students and conducting their research projects.

Standard 6-6: Their mechanisms in place for Faculty development

- Yes, there is a mechanism in place for Faculty development.

Standard 6-7: All faculty members should be motivated and have job satisfaction to excel in their profession.

- The young faculty is mobilized by timely back up and appreciation by the senior faculty members. Avenues for research funding are provided through university research fund. Results of faculty survey employing Proforma-5 are summarized in graphical representations. The results showed satisfaction of the teachers over most of the parameters.

Criterion 7: Institutional Facilities

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

- The library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personnel.
- These aspects need to be strengthened in number and space.
- Class rooms must be air conditioned and adequately equipped and offices must be adequate to enable faculty to carry out their responsibilities.

Standard 7-1: Infrastructure:

The faculty has access to E-library which is very helpful for the high quality learning/education and access to scientific publications. The internet facility is also available to faculty members on campus which further strengthens scientific activities. However the department has the following shortcomings/problems:

- The Internet services are provided by the university; however the speed of internet is slow. Most of the faculty members have access to telephones which are also connected with the internet.
- Breach of power intermittently, due to which research and academic work both are suffered, however university has provided quite a reasonable back-up by local generator
- Drinking water facility is adequate for staff and students.

- Untrained supporting staff.
- Insufficient budget to meet with routine administrative and academic activities.
- Washrooms are inadequate for students and staff. In addition cleanliness of washrooms is not taken care of adequately.

Standard 7-2: Library Facilities:

The University Central Library has wide range of books; however journals and periodicals are limited. Department itself owns a small library with up-to-date editions of relevant books.

Standard 7.3: Class Room and Faculty Offices

Currently the class rooms are enough and multimedia are available for the lecture halls. Lecture rooms are not air conditioned, due to which teachers and students face difficulty in summer. Practical lab space is adequate however not enough for increasing number of students, this affects the quality of teaching. Faculty offices are available and provided to regular faculty members as well as to contract and IPFPs faculty members.

Criterion 8: Institutional Support

The institutional support is provided by the university however budget provision is insufficient.

- There must be sufficient support & financial resources to attract and retain high quality faculty and provide them means for to maintain competence as teachers and scholars.
- The department at present avails all the human resources.

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

Support and Financial Resources

- At present department is having a very meager financial resource to maintain its present needs. The main support for departmental research activities has been earned through individual research grants won by faculty and indigenous scholarships by a few students. There is a dire need for increasing the financial resources allocated to the department to strengthen academic and research activities.

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

Students are admitted in PhD. twice in a year. A strict merit policy is applied for admissions. A detail of the students enrolled during the past years is given in the following Table.

TABLE-8: ENROLLMENT IN PhD PROGRAMS FROM 2012-14

Degree Program	Year-Wise Enrollments		
	2012	2013	2014
Ph.D	04	07	09

Standard 8-3: Financial Resources

Total budget of the department for the financial year 2012-14 is only Rs. 50,000/- year which only Fulfill basic departmental needs. However, with the introduction of new degree programs along with increase in the number of students, department is under huge pressure to provide chemicals for basic laboratories as well as for research students, regular repair/maintenance of infrastructure & equipments and books/journals/periodicals for the department library.F

Summary

This Self Assessment Report (SAR) is for Ph.D Biochemistry degree programs. The report contains eight sections in which first section outlines the program mission and objectives while section-2 provides information about the curriculum development and section-3 enlists the laboratories and other relevant information. The last four sections provide information about student support, process control, faculty characteristics, institutional facilities and support provided by the university.

The program mission, objectives and outcomes are assessed and strategic plans presented to achieve the suggested/targeted goals measurable through definite standards. The outcomes regarding Ph.D Biochemistry programmes appeared to be highly appropriate. The results of proforma no. 10, collected during the sessions 2012-14, provides scores of evaluation by the students for all teachers of the Department of Biochemistry. Whereas the results of proforma no.1 presents the scores evaluation by the students for all courses offered by the department during the years 2012-14. Based on proformas no. 1 & 10, the overall analysis clearly shows that students were satisfied with the courses offered, courses contents, teaching material provided as well as by the teaching abilities of the teaching faculty.

The curriculum of PhD Biochemistry fully satisfies the core requirements for the programme as specified by the HEC. The information technology component of the curriculum has been applied by offering non-conventional courses like Bioinformatics. Curriculum design and update is regularly initiated by the faculty members of the Department. After approval from Departmental Board of Studies comprised of senior faculty members and subject specialist from other faculties or from other Universities or research Institutions. The approved curriculum is then sent to Board of Faculty, headed by the Dean Faculty of Sciences. This Board consist senior faculty members from all the Departments of the faculty and subject specialists. Finally the curriculum is presented before the Academic Council which is comprised of the Professor, Associate Professor, Faculty Representatives and very senior subject specialists.

The process of admission is well established and followed as per rules and criteria defined by the HEC and the University. Admissions are advertised in the National News Papers by the Registrar Office. While rules for admission, fee structure, registration, recruiting policy, courses and delivery of material, academic requirements, performance and grading have been set forth by the university as well as Higher Education Commission and are followed accordingly.

Infrastructure of the department is adequate for running Ph.D Biochemistry degree programs. The class rooms, general laboratories and research laboratories are reasonably equipped with adequate facilities. Institutional facilities were measured through Criterion 3; which highlighted infrastructure and facilities, class rooms, faculty offices, computing facility support, short comings in computing infrastructure and safety arrangements. However, institutional facilities need to be strengthened and updated to meet the requirements of existing as well as for the upcoming new M.Phil/PhD level degree programs.

According to the results of the proforma No. 4, the HEC indigenous scholarship holders pointed out the laborious and time consuming methods regarding administrative and financial approval of the budget/ clarification of bills, as well as maintenance. They urged the need for the simplification of the procedure. Majority of the students at M.Phil. and Ph.D level are

interested in foreign trainings, operating sophisticated equipments and learning latest techniques/tools in Biochemistry. They also pointed out the problems regarding to the availability of chemicals, consumables and literature related to their research work.

CONCLUSIONS

Following points are being considered based on the assessment of PhD Biochemistry programs;

- 1 HEC indigenous scholarship holders pointed out about the laborious and time consuming methods regarding administrative and financial approval of the budget/ clarification of bills, as well as maintenance. They urged the need for the simplification of the procedure.
- 2 Majority of the students at Ph.D level are interested in foreign trainings, operating sophisticated equipments and learning latest techniques/tools in Biochemistry. They also pointed out the problems regarding availability of chemicals/consumables, un-scheduled power-breaks which has caused extensive damage to sophisticated equipments. Unavailability of full length scientific literature related to their research work.
- 3 The faculty survey reveals that infrastructure still needs some upgradations like; air-conditioners in some of the research labs. Some important issues were; un-scheduled power-breaks & extensive damage to sophisticated equipments and lack of facilities/services for the repair and maintenance of laboratory equipments, cleanliness of overall building and washrooms; regular repair and maintenance of building/everyday use items.
- 4 In order to keep faculty member updated with latest research tools and techniques and to initiate/maintain productive scientific collaborations, regular foreign trainings are to be arranged.
- 5 The annual budget for the department needs to be increased for the smooth conduct of research activities at post-graduate levels.
- 6 There is dire need for the appointment of a security guard to ensure safety of building and especially research laboratories holding sophisticated equipments.
- 7 The weakest point noted is the lack of quality time a faculty has for his/her research projects, scientific write-ups/publications and family activities.
- 8 Computers and internet facilities are available to all regular faculty members and post graduate students to boost the level of research and teaching.

ANNEXTURE I

Results of Performa No. 2: Results of Faculty Course Review Report

Performa No. 2 was filled by the respective course instructor via CMS facility present on the university website. Most of the respected teachers found that the course is updated and well in accordance with the guidelines provided by the HEC. The assessment methods are satisfactory and appropriate. Most of the teachers have consensus that the courses are up to date as per HEC criteria, moreover assessment methods consisting of mid terms, final term, quizzes and assignments is good.

Department	Biochemistry
Faculty	Sciences
Courses	Described earlier in SAR Assessment method As per University rules and regulations
Distribution of Grades/Marks	As per University rules and regulations
Overview/Evaluation (course Co-coordinator's comments)	Satisfied
Students (course evaluation survey)	Satisfied
External Examiner	NA
Student/Staff Consultative committee	N/A
Curriculum	In accordance with HEC guidelines
Assessment	Course objectives well defined and well achieved
Enhancement	Proposed changes in earlier course review report incorporated
Future changes	New and modern practical approaches may be incorporated if possible

ANNEXTURE II**Results of Proforma No. 4: Research Student Progress Form**

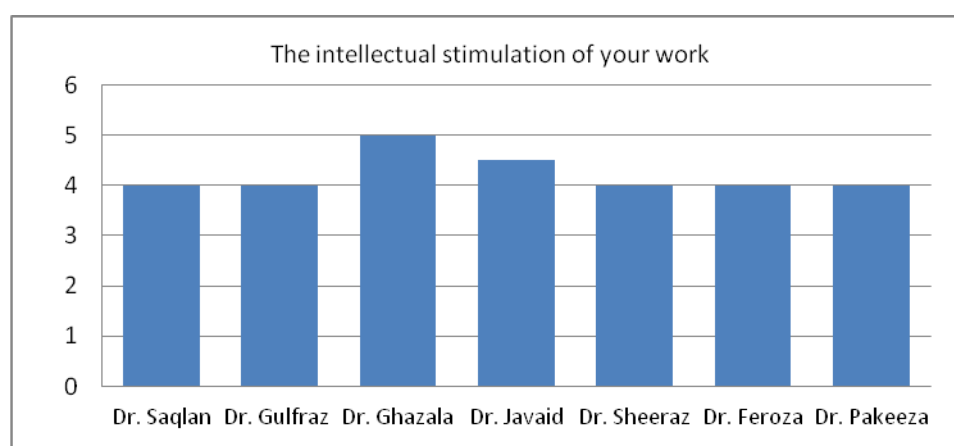
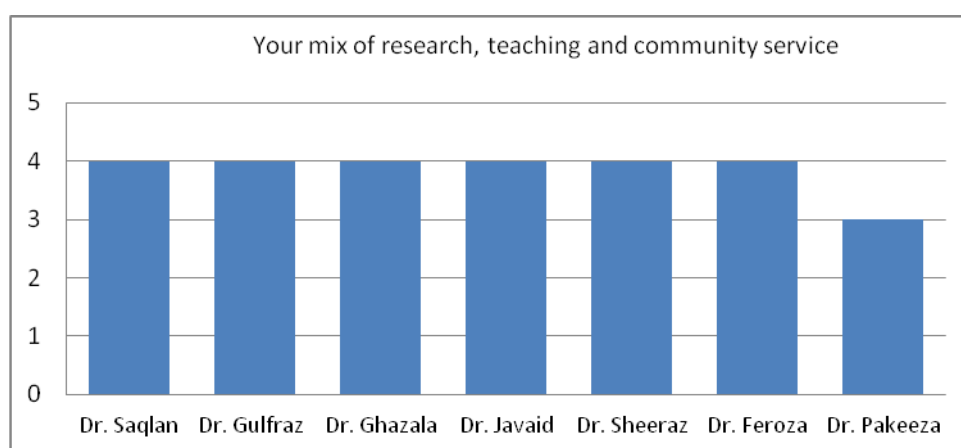
According to the result of the proforma No. 4. The students of M.Phil. and Ph.D. pointed out the problems regarding to the administrative and financial approval of the budget/ and as well as maintenance. Most of the students of M.Phil. and Ph.D are interested to take training from abroad and they also have keen interest to operate sophiscited equipments. They also pointed out the problems regarding to the availability of chemicals, consumables and literature related to their research work. The students holding HEC indigenou scholarship pointed out the laborious and time consuming methods for the clarification of bills, etc. They urged the need for the simplification of the procedure.

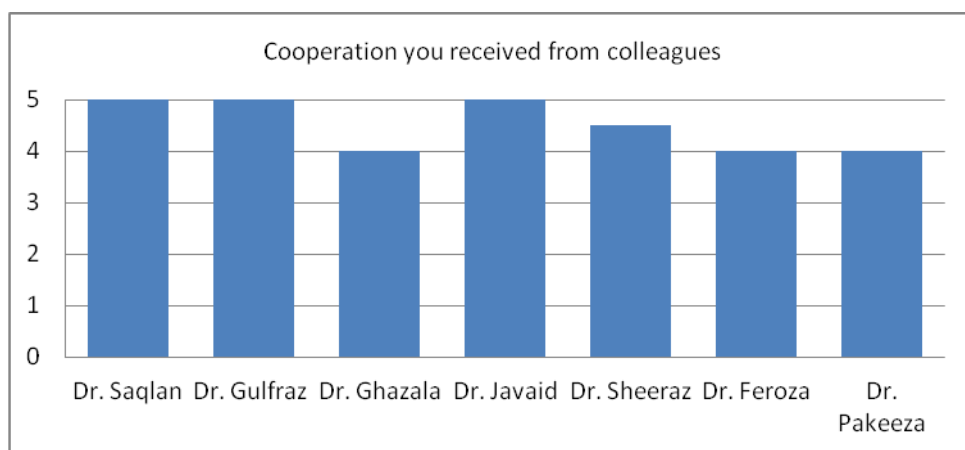
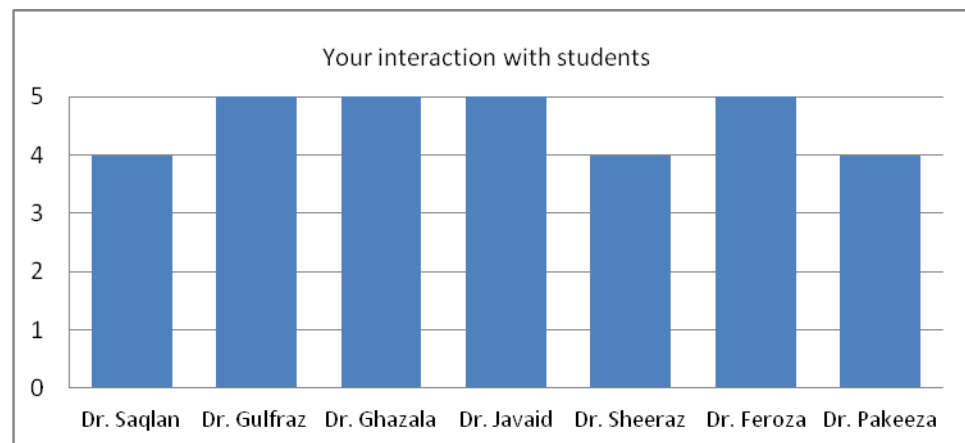
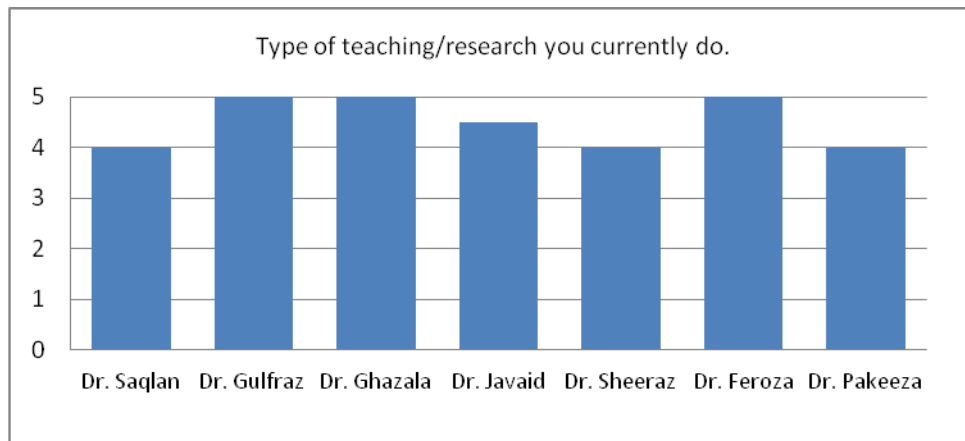
ANNEXTURE -III

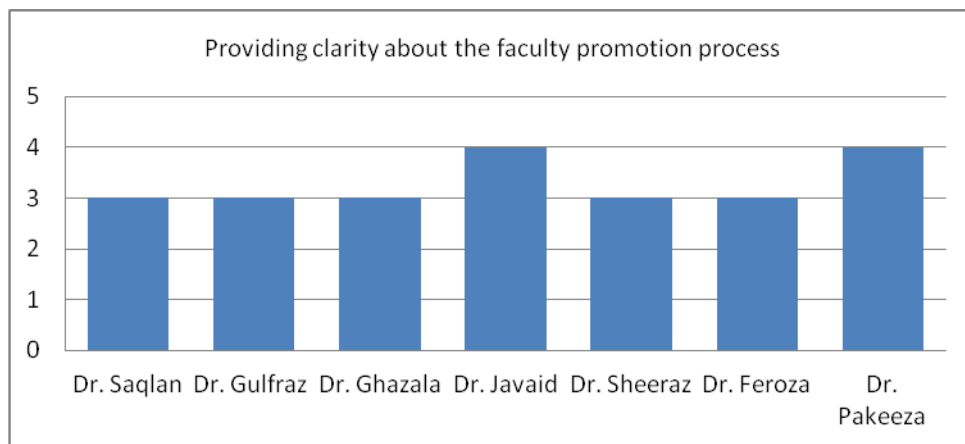
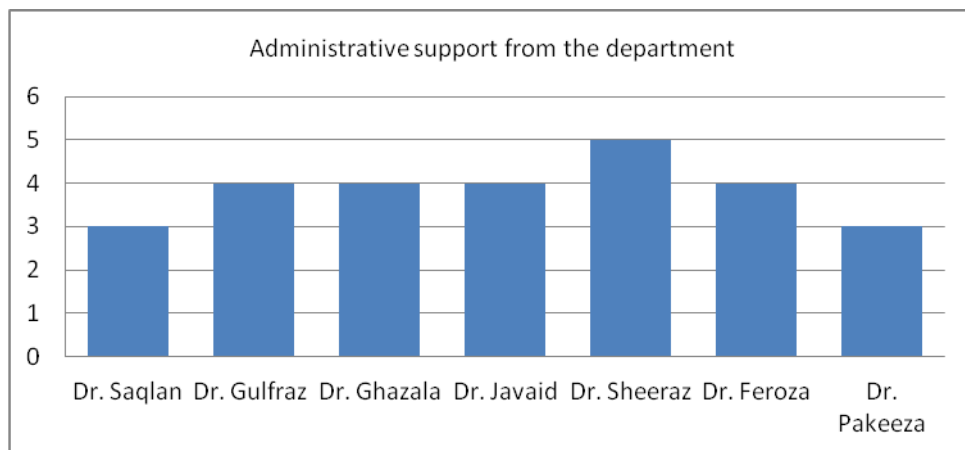
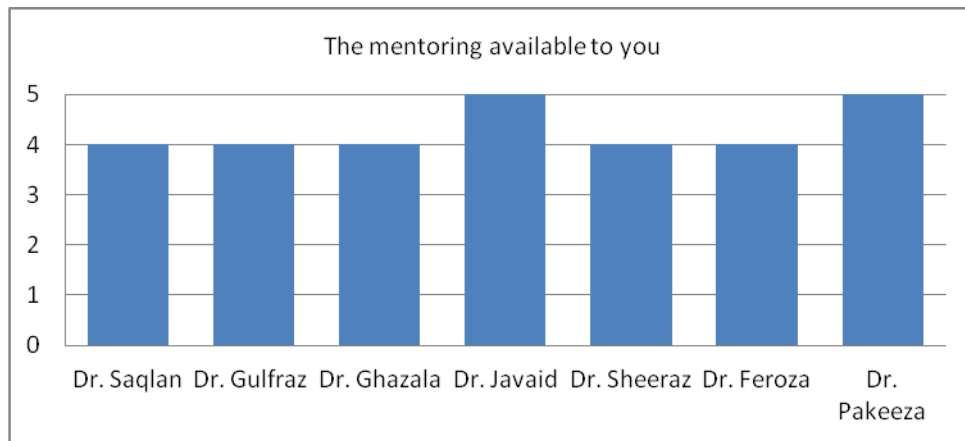
Proforma No. 5: Results of Faculty Survey

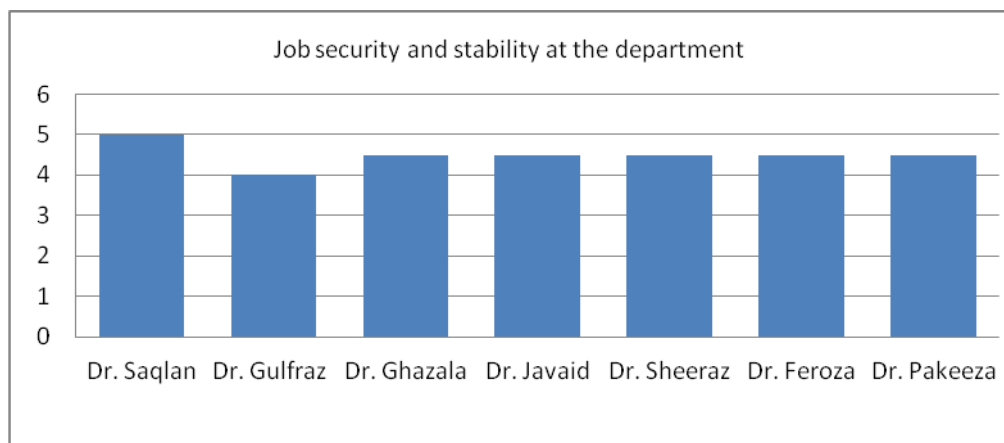
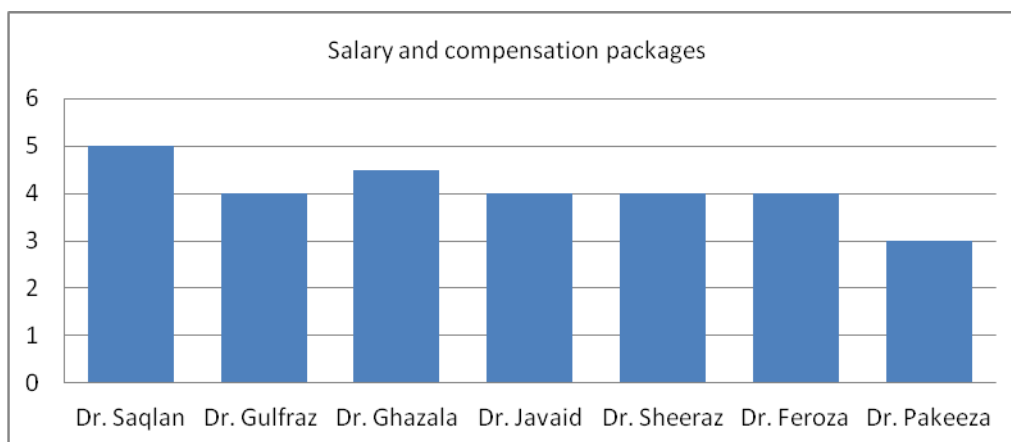
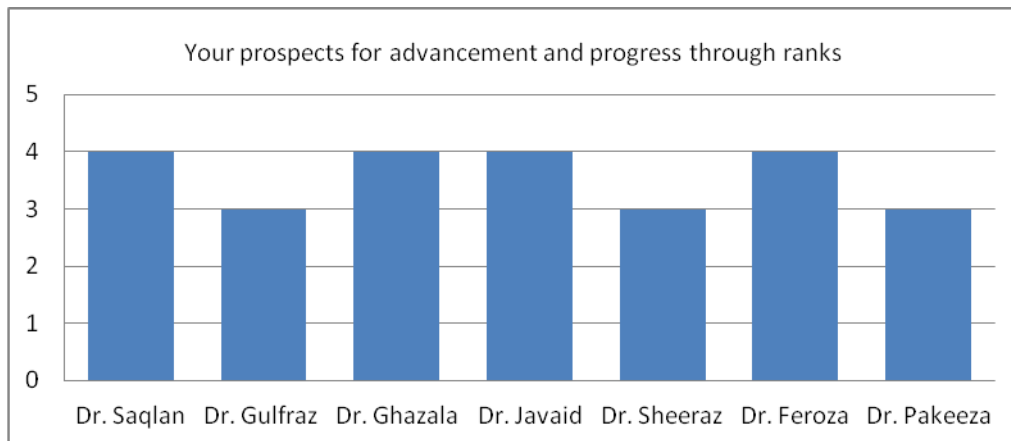
A faculty survey was conducted to get the feedback of faculty members about their research and academic activities. The following bar graphs indicate that most of the faculty members were satisfied about their mix and type of research, teaching and community services. They also found it intellectually stimulating. The overall environment and mentoring available is different for various faculty members. The faculty showed unanimous satisfaction over the interaction with the student and support of administrative staff.

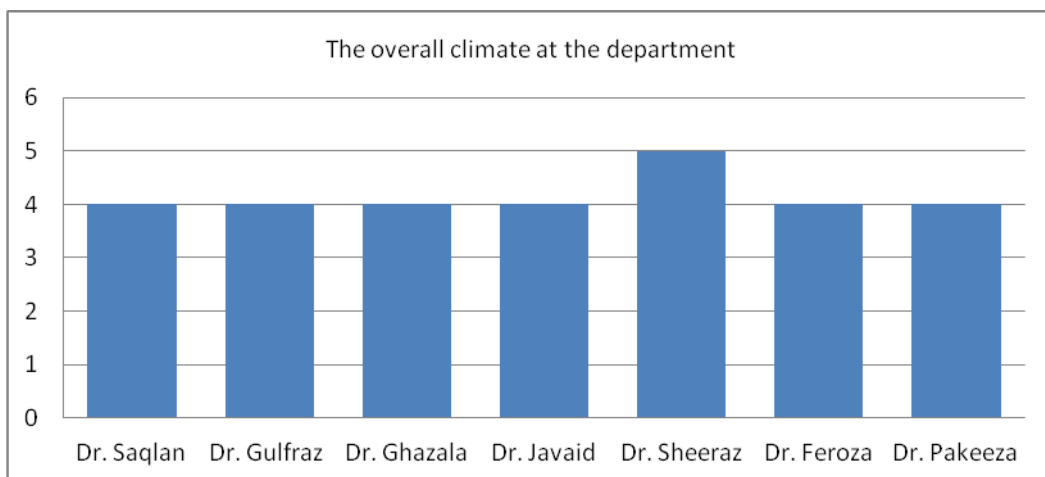
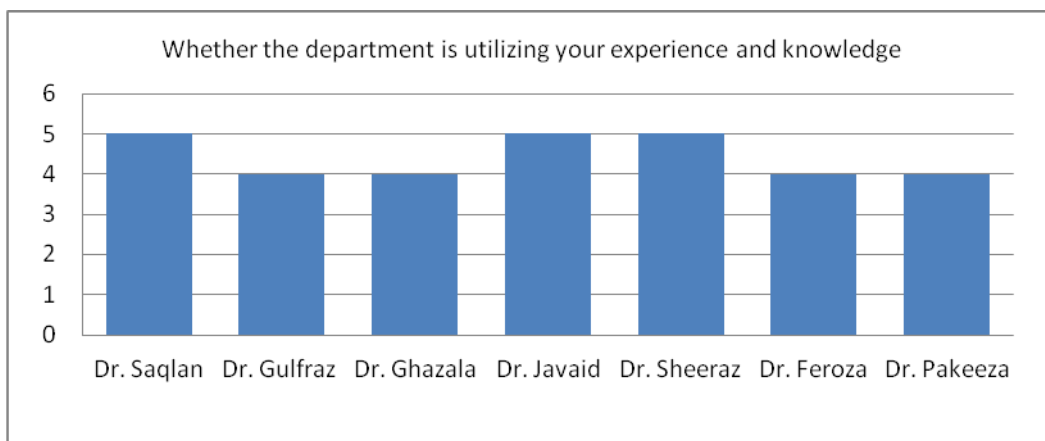
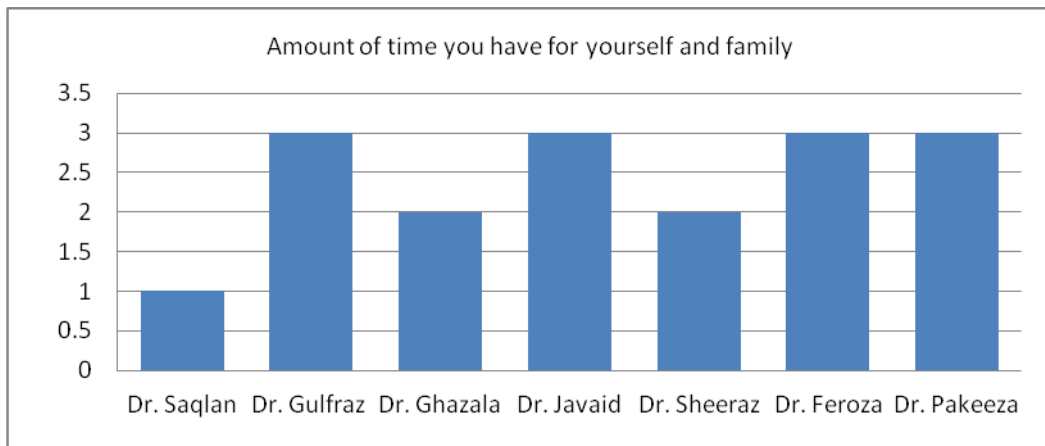
According to proforma 2 regarding the satisfaction of the Faculty, the weakest aspect is the amount of time teachers find to interact with their families.





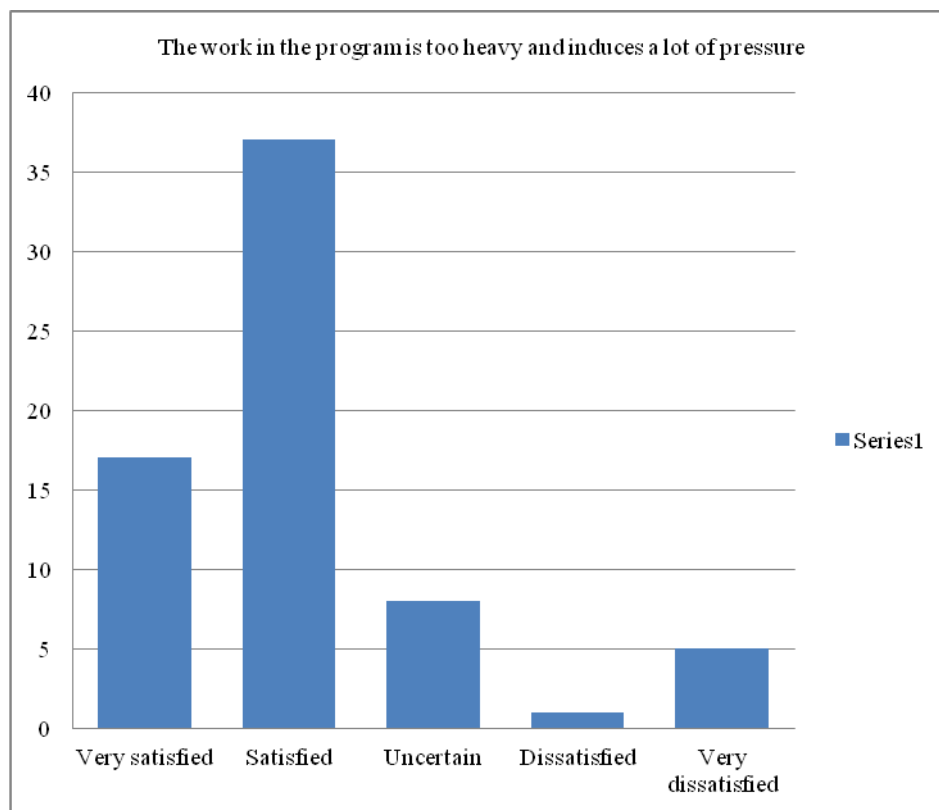


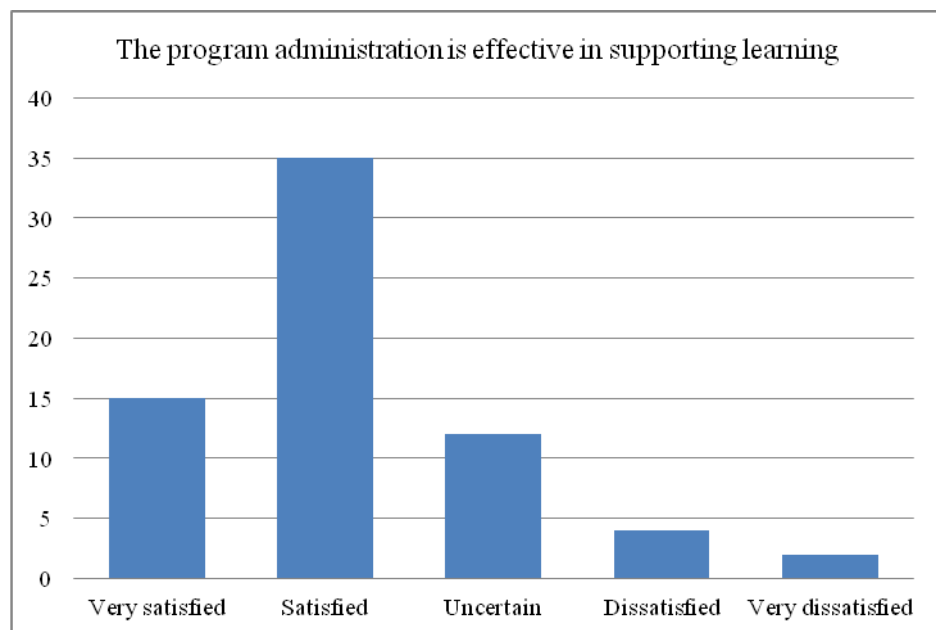
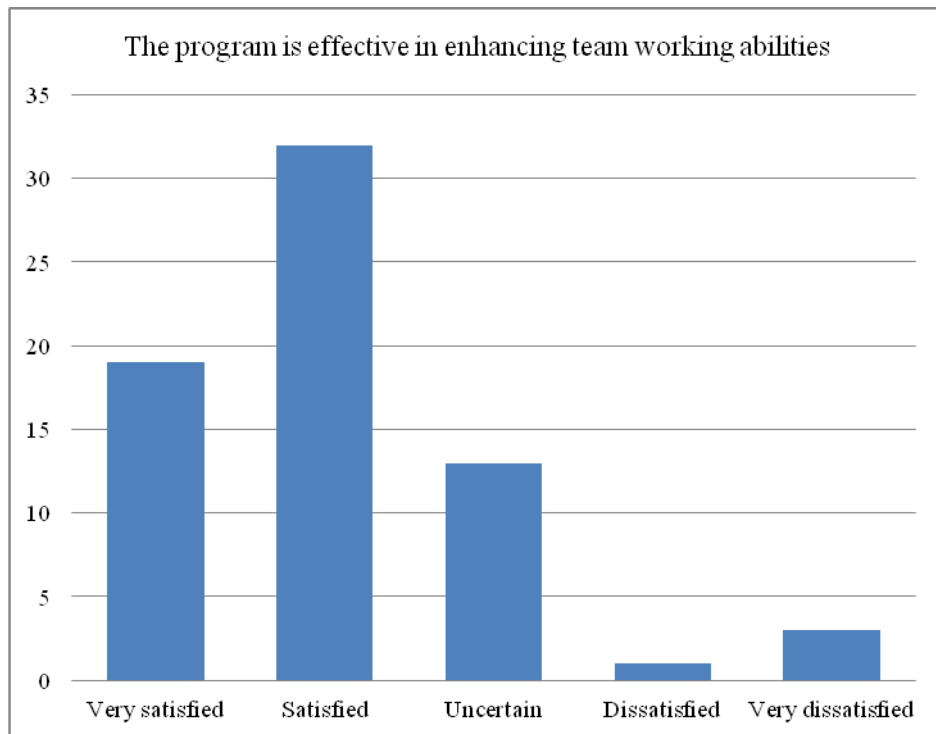


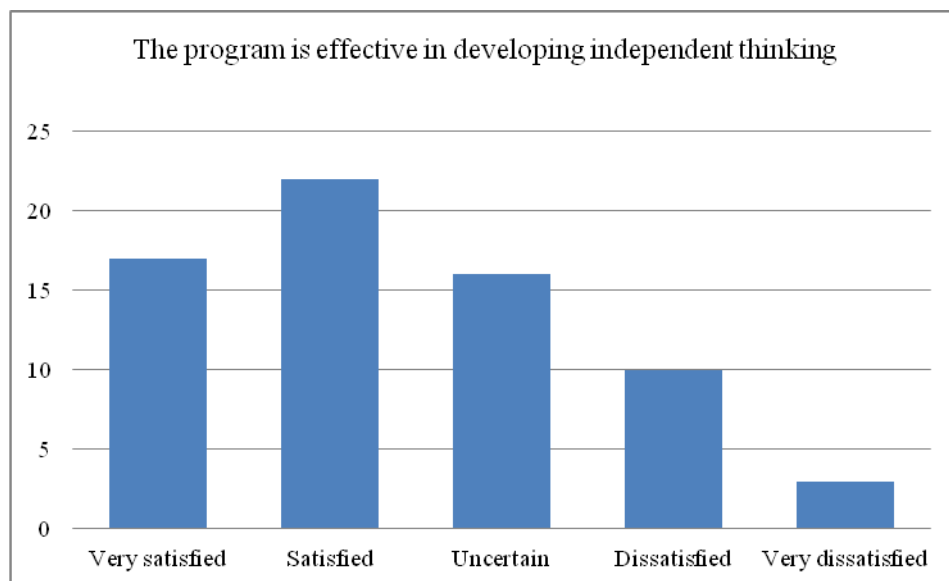
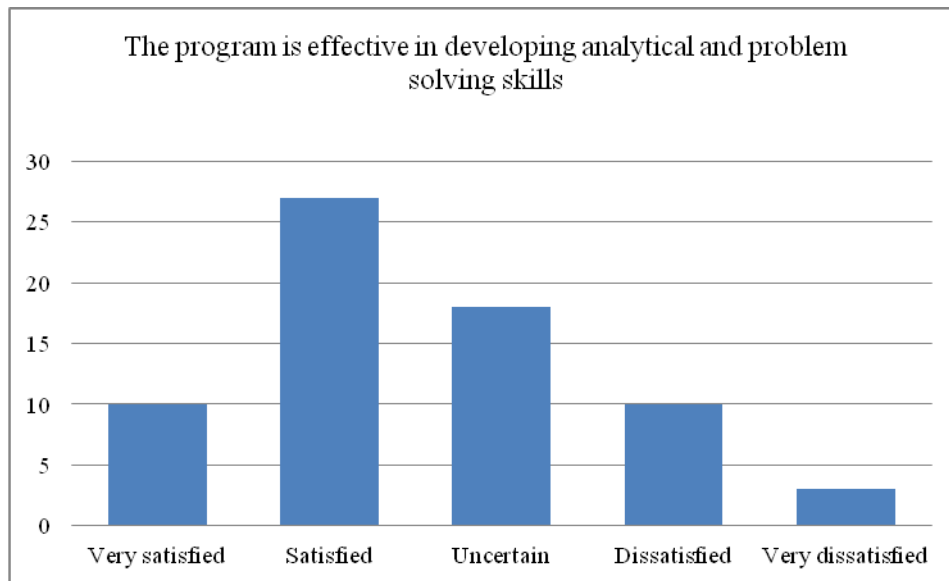


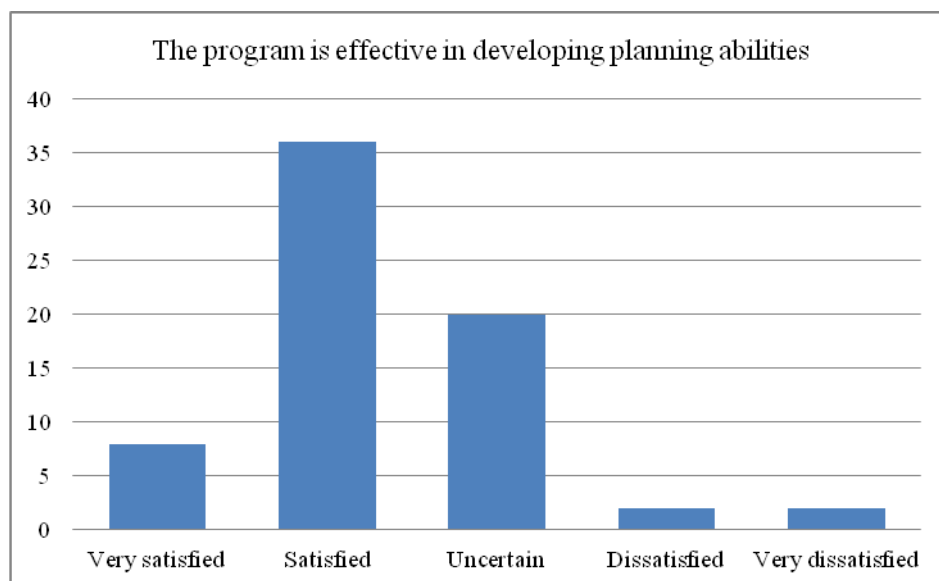
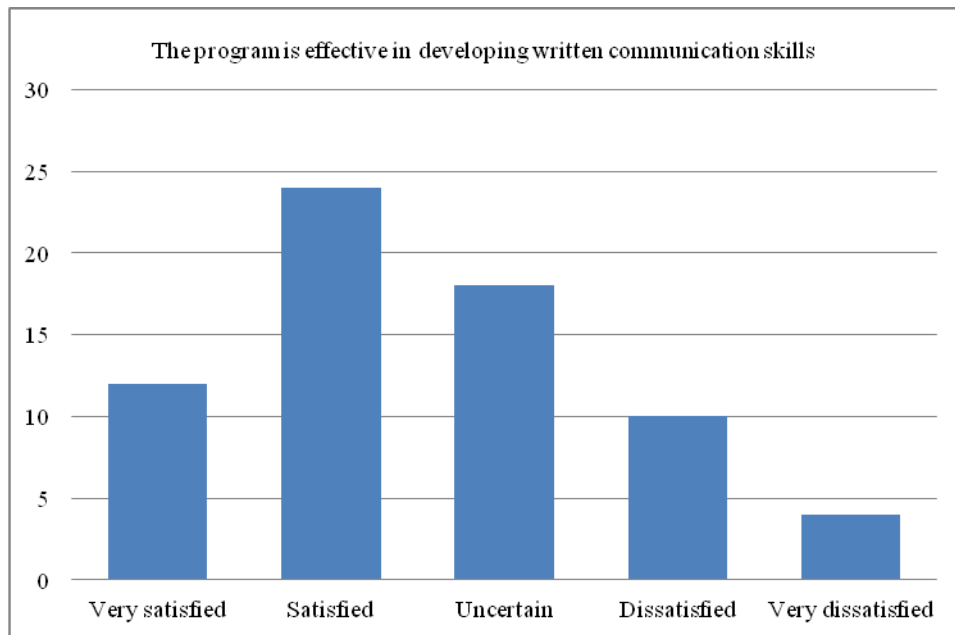
ANNEXURE IV**RESULTS OF GRADUATING STUDENTS SURVEY**

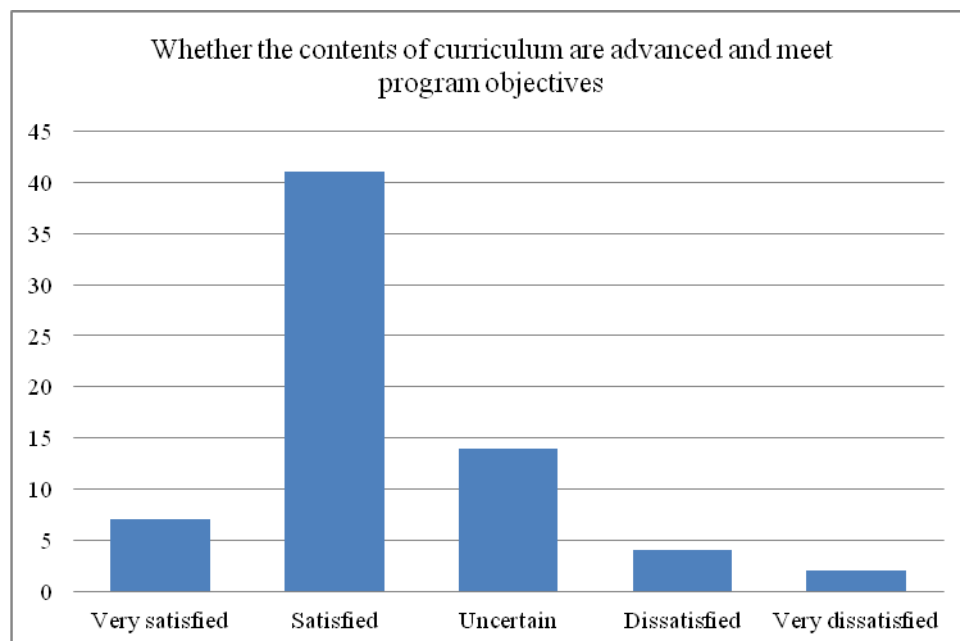
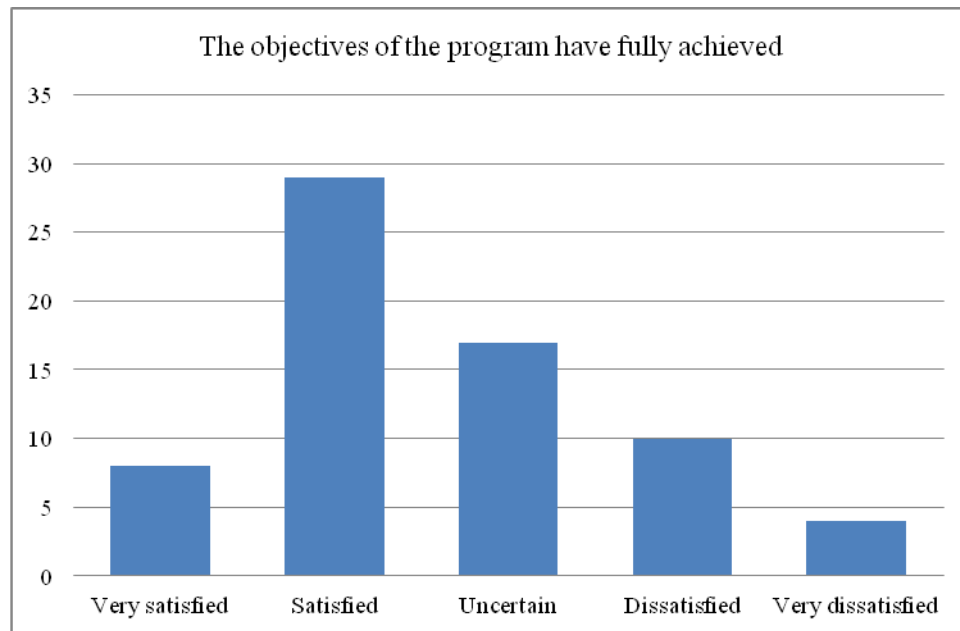
Survey of graduating students clearly indicates satisfaction of the graduates over the degree programs of the department. However, there were some students who showed dissatisfaction over the number of scholarships available.

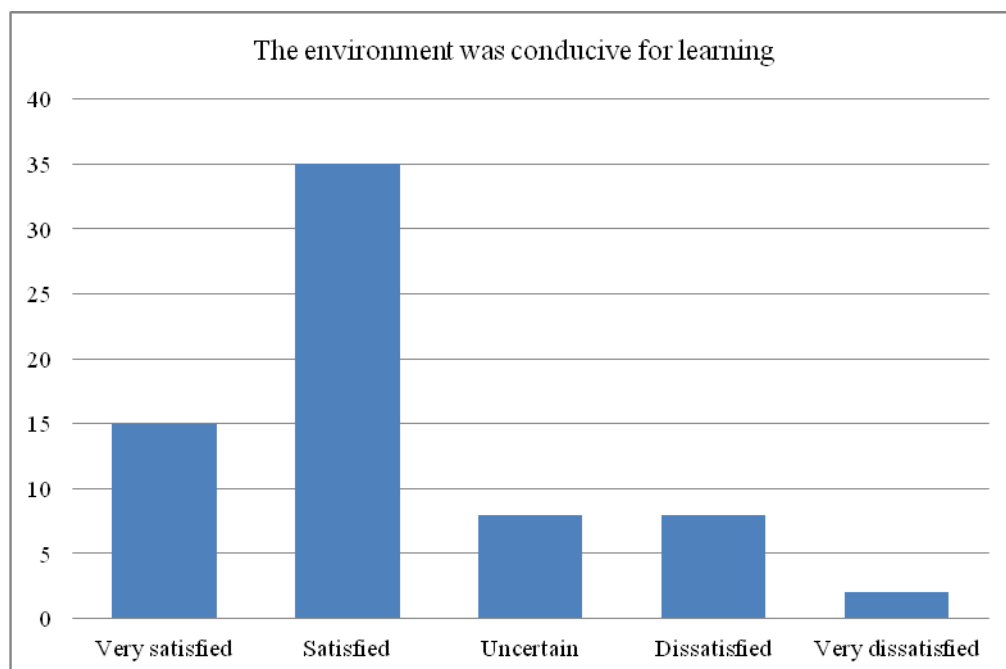
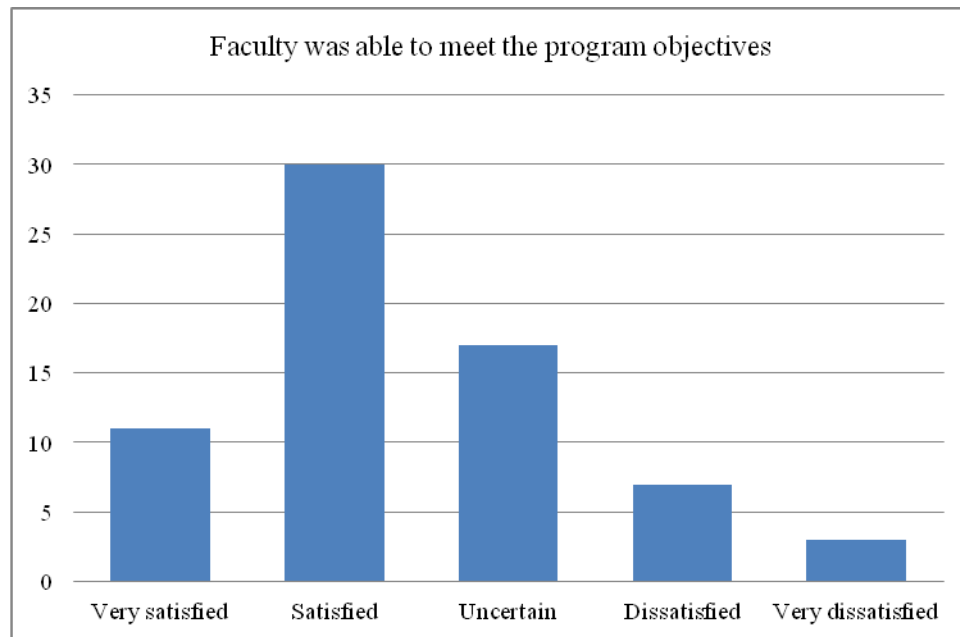


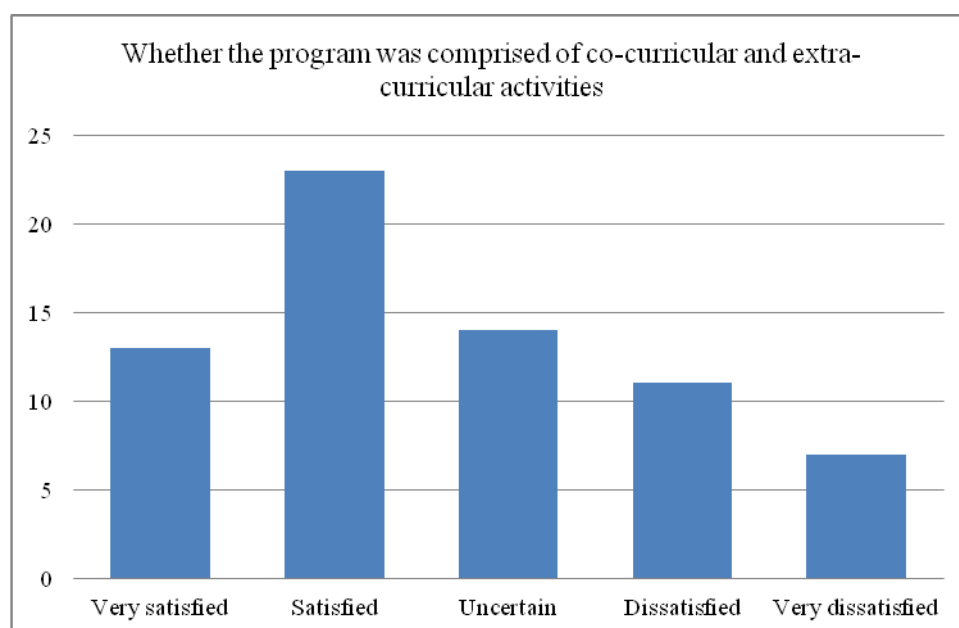
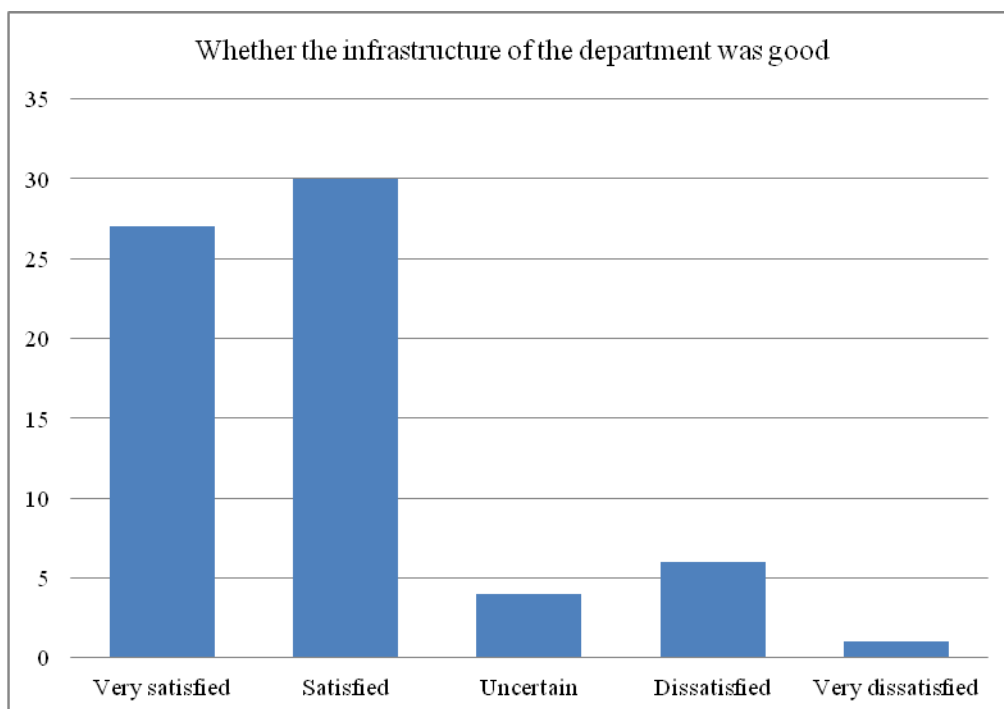


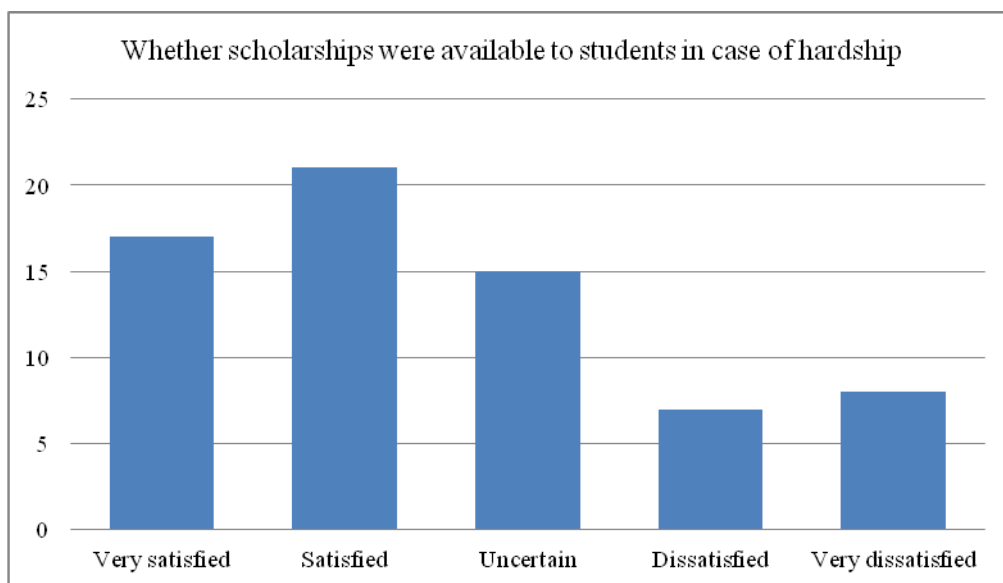












ANNEXURE V



Proforma 6

SURVEY OF DEPARTMENT OFFERING Ph.D. PROGRAMS

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

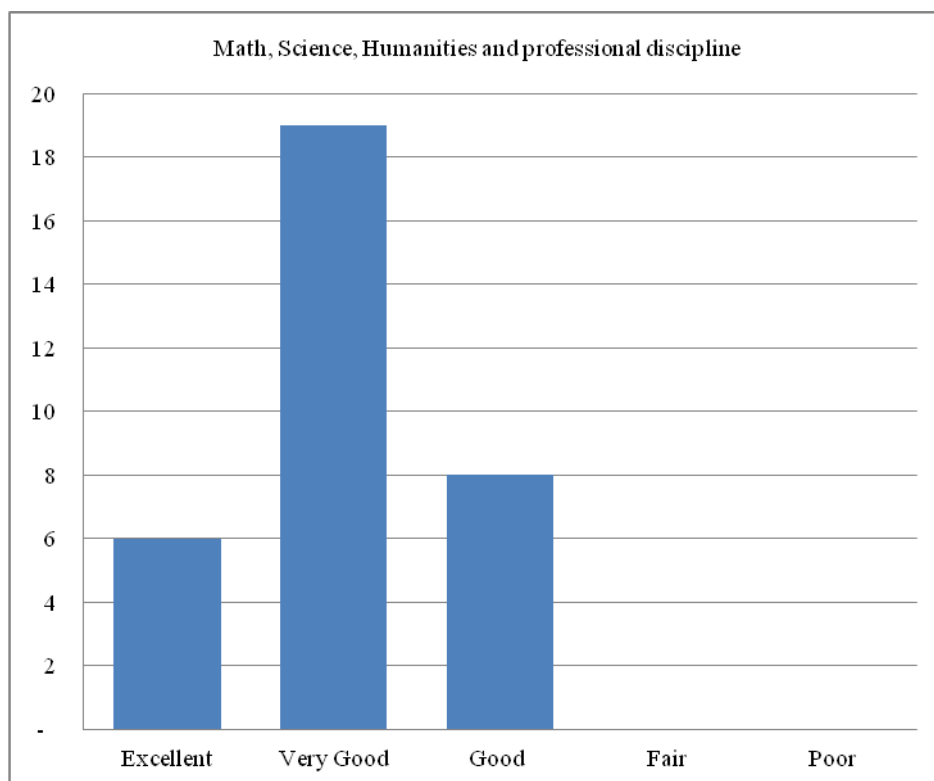
1	General Information:	
1.1	Name of Department	Biochemistry
1.2	Name of Faculty	Sciences
1.3	Date of initiation of Ph.D. program	2001
1.4	Total number of academic journals subscribed in area relevant to Ph.D. program.	HEC Digital Library Journals
1.5	Number of Computers available per Ph.D. student	1
1.6	Total Internet Bandwidth available to all the students in the Department.	2 MB for whole Campus
2	Faculty Resources:	
2.1	Number of faculty members holding Ph.D. degree in the department.	8 out of 8
2.2	Number of HEC approved Ph.D. Advisors in the department.	8
3	Research Output:	
3.1	Total number of articles published last year in International Academic Journals that are authored by faculty members and students in the department.	86 (2012-14)
3.2	Total number of articles published last year in Asian Academic Journals that are authored by faculty members and students in the department.	20 (2012-14)
3.3	Total number of ongoing research projects in the department funded by different organizations	11
3.4	Number of post-graduate students in the department holding scholarships/fellowships.	24
3.5	Total Research Funds available to the Department from all sources	More than 10 million
3.6	Number of active international linkages involving exchange of researchers/students/faculty etc. (Attach Details).	13

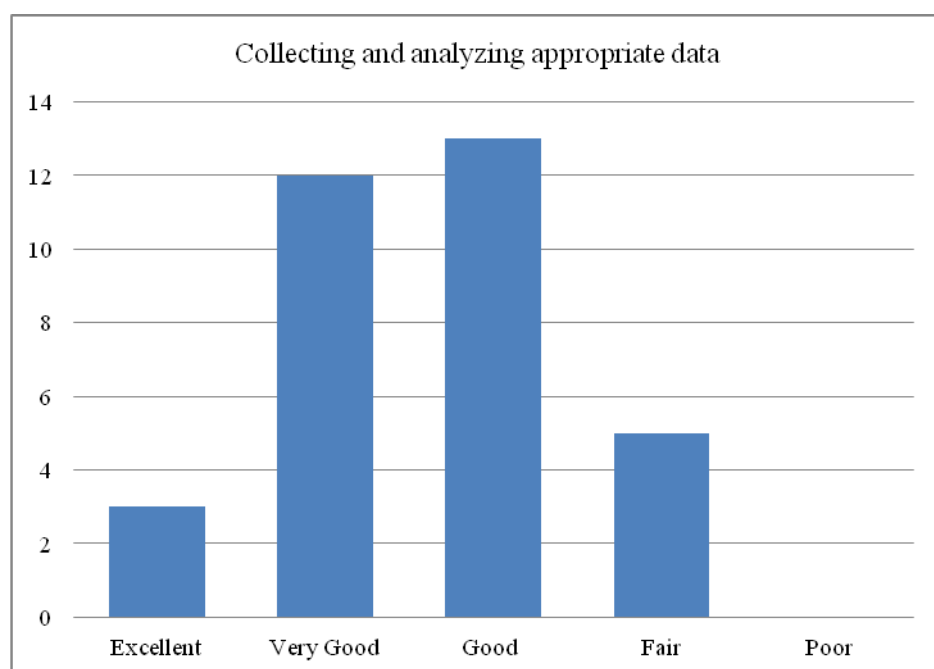
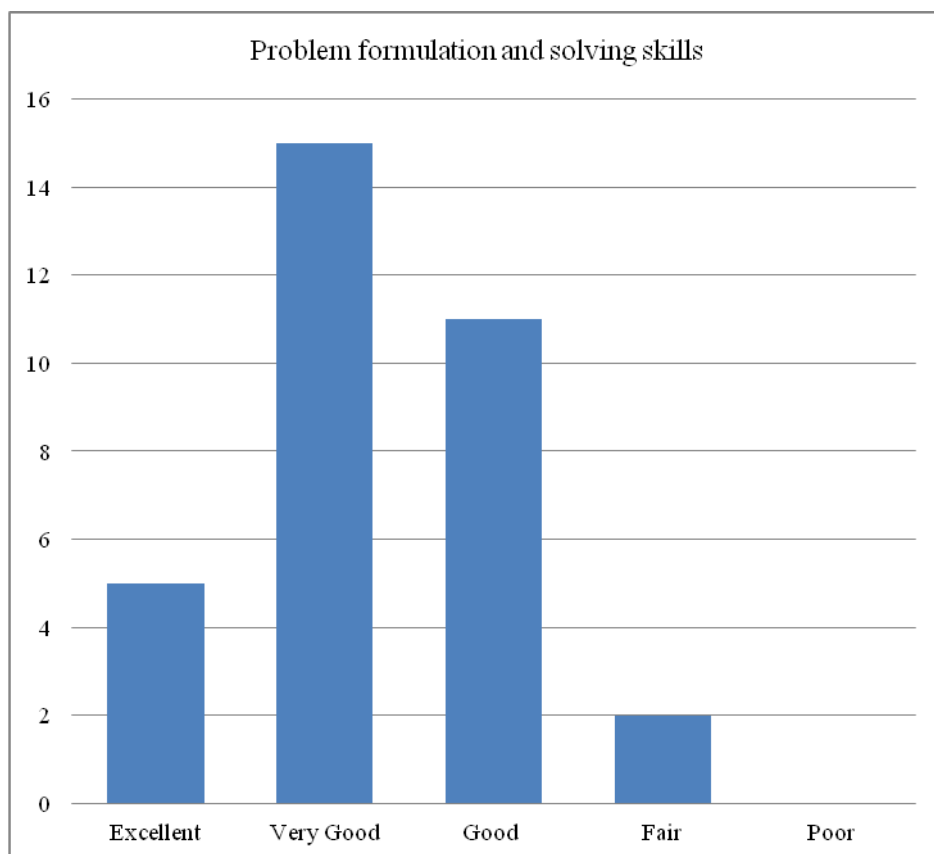
4	Student Information:	
4.1	Number of Ph.D. degrees conferred to date to students from the Department during the past three academic years.	22
4.2	Number of Ph.D. students currently enrolled in the department.	30
4.3	Ratio of number of students accepted to total number of applicants for Ph.D. Program.	1:5
5	Program Information	
5.1	Entrance requirements into Ph.D. Program (M.Sc. / M.Phil.) Indicate subjects or M.Sc. / M.Phil.	M.Phil.
5.2	Is your Ph.D. program based on research only? (Y/N)	No.
5.3	Maximum number of years in which a Ph.D. degree has to be completed after initial date of enrollment in Ph.D. program.	5 years 10 semester
5.4	Total number of post M.Sc. (16 year equivalent) courses required for Ph.D.	30+18=48 credit
5.5	Total number of M.Phil. level courses taught on average in a Term / Semester.	4
5.6	Total number of Ph.D. level courses taught on average in a Term / Semester.	2
5.7	Do your students have to take/write:	
	a. Ph.D. Qualifying examination (Y/N)	Y
	b. Comprehensive examination (Y/N)	Y
	c. Research paper in HEC approved Journal	Y
	d. Any other examination (Y/N)	NTS
5.8	Total number of International examiners to which the Ph.D. dissertation is sent.	94
5.9	How is the selection of an examiner from technologically advanced countries carried out?	Based on Position Experience Relevance
5.10	Is there a minimum residency requirement (on campus) for award of Ph.D. degree?	Six Semesters
6	Additional Information	
6.1	Any other information that you would like to provide.	TTS

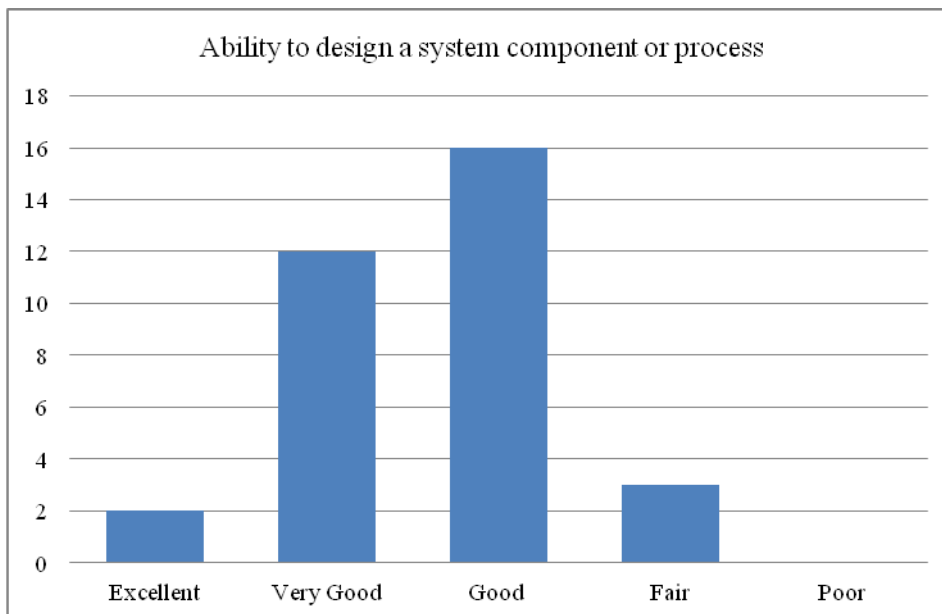
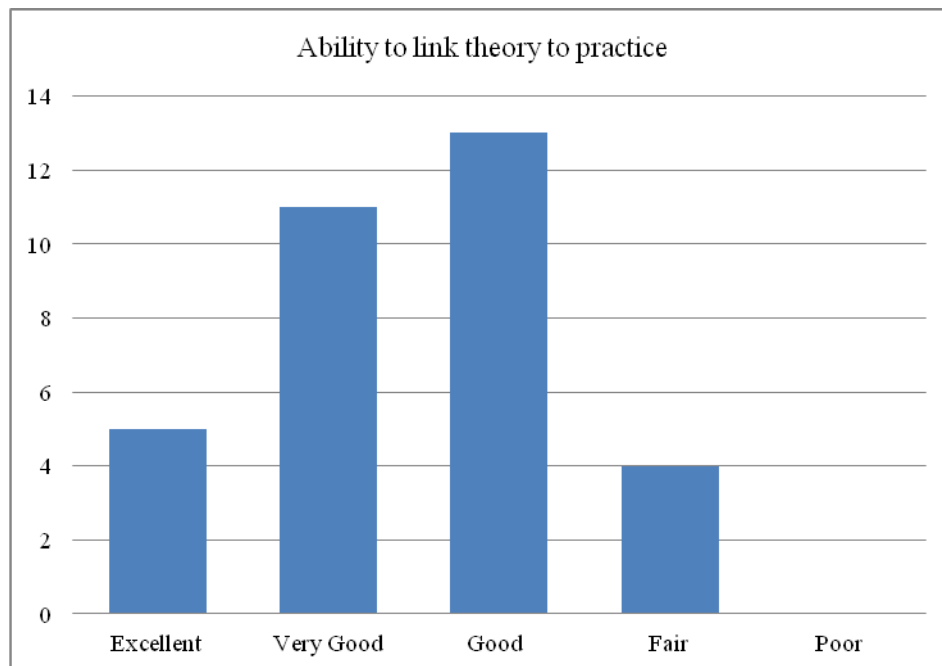
ANNEXURE VI

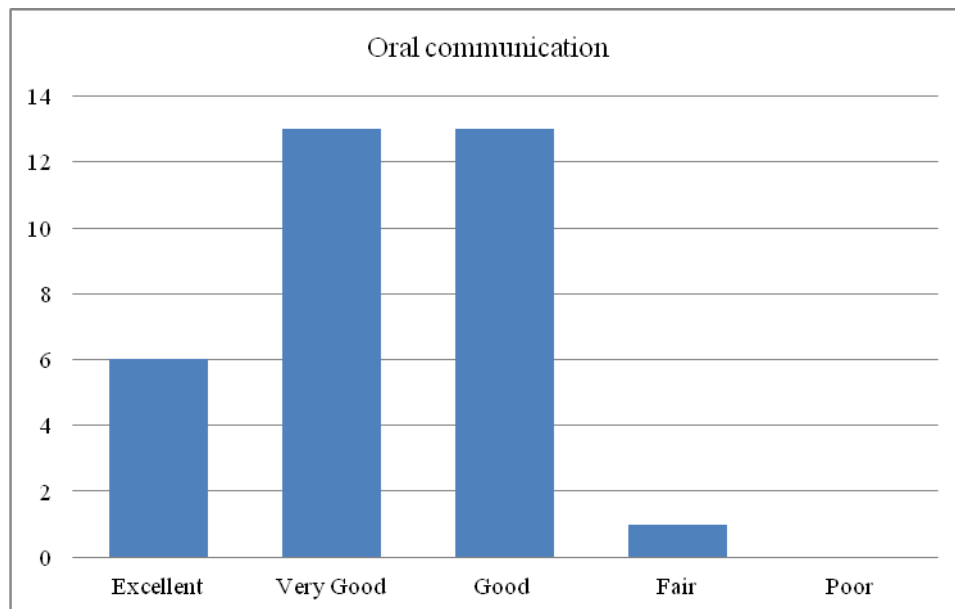
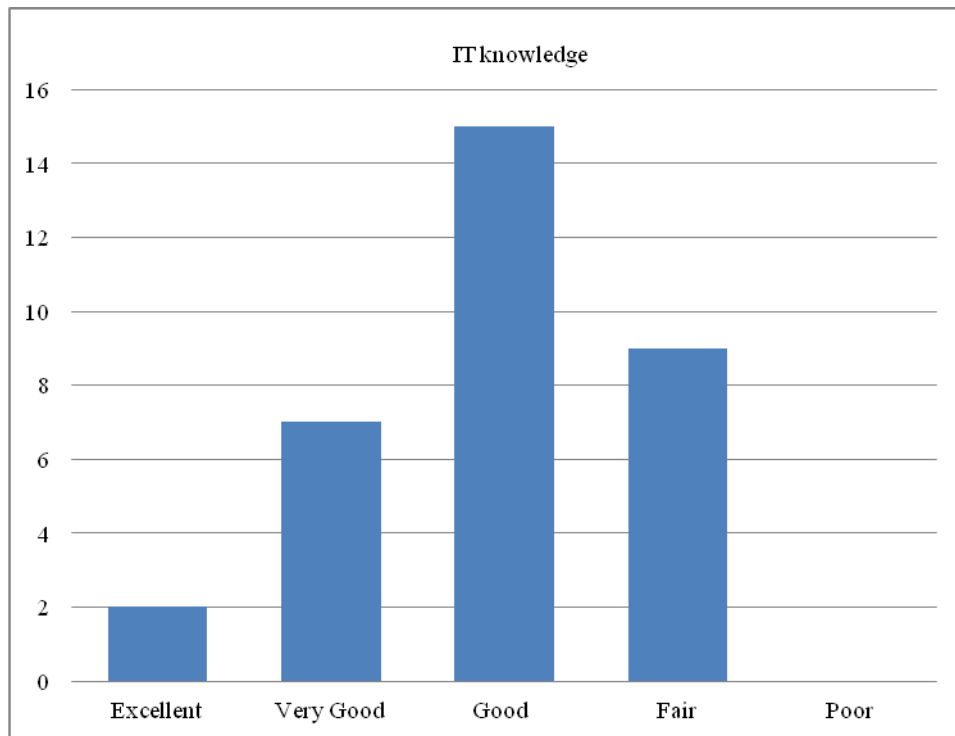
Proforma 7:ALUMNI SURVEY RESULTS:

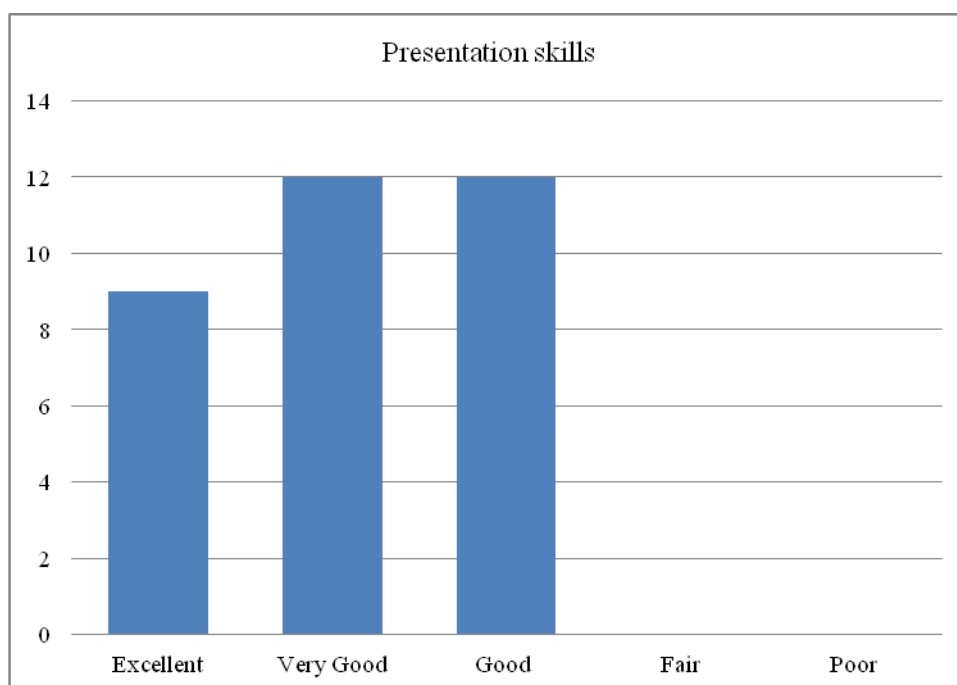
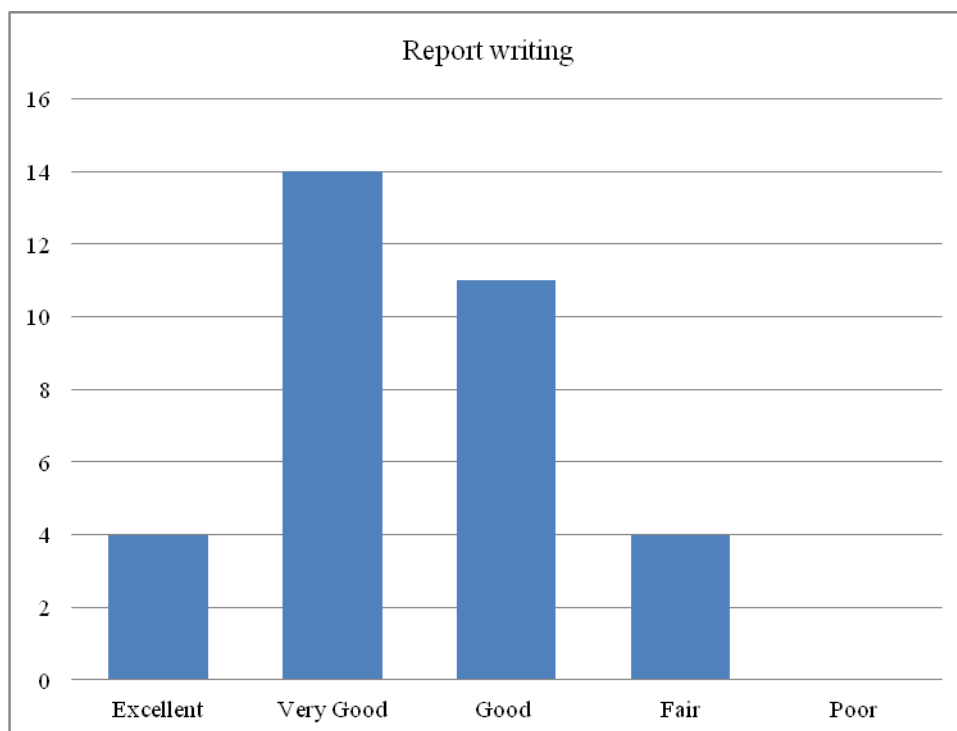
The graduates of Biochemistry Department join mostly research institutes, universities, hospitals, diagnostic laboratories etc, so Proforma 7 was sent to concerned institutes and overall feedback results of program assessment by the Alumni are presented in the following figure.

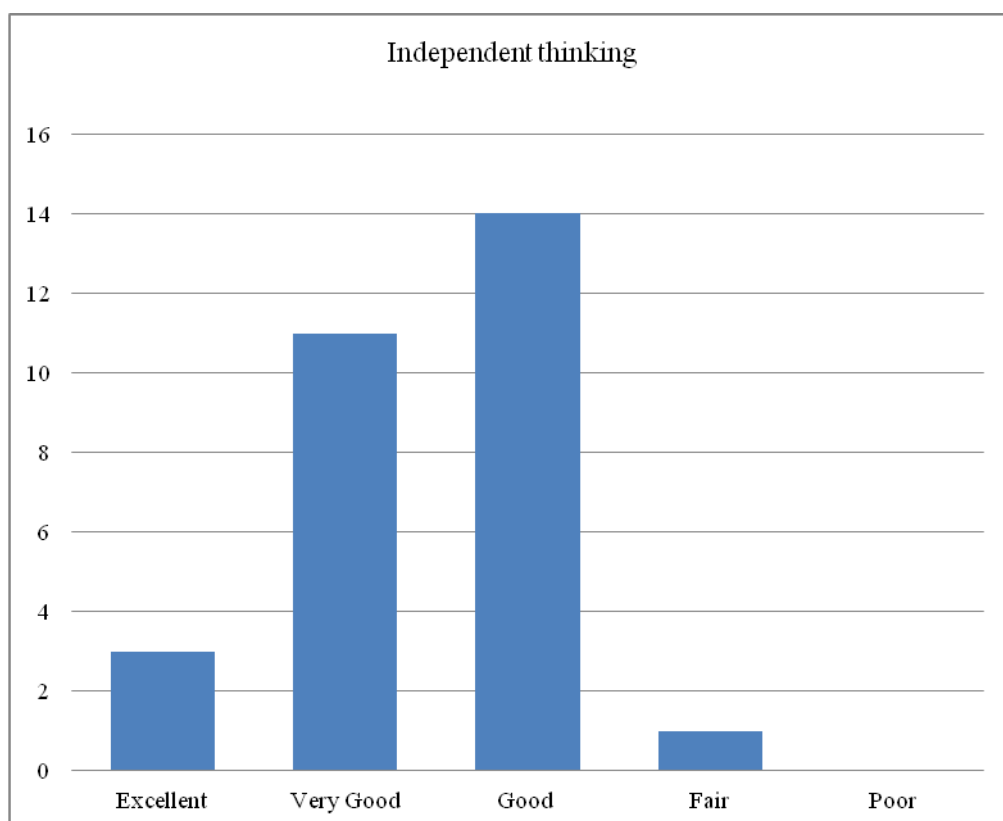
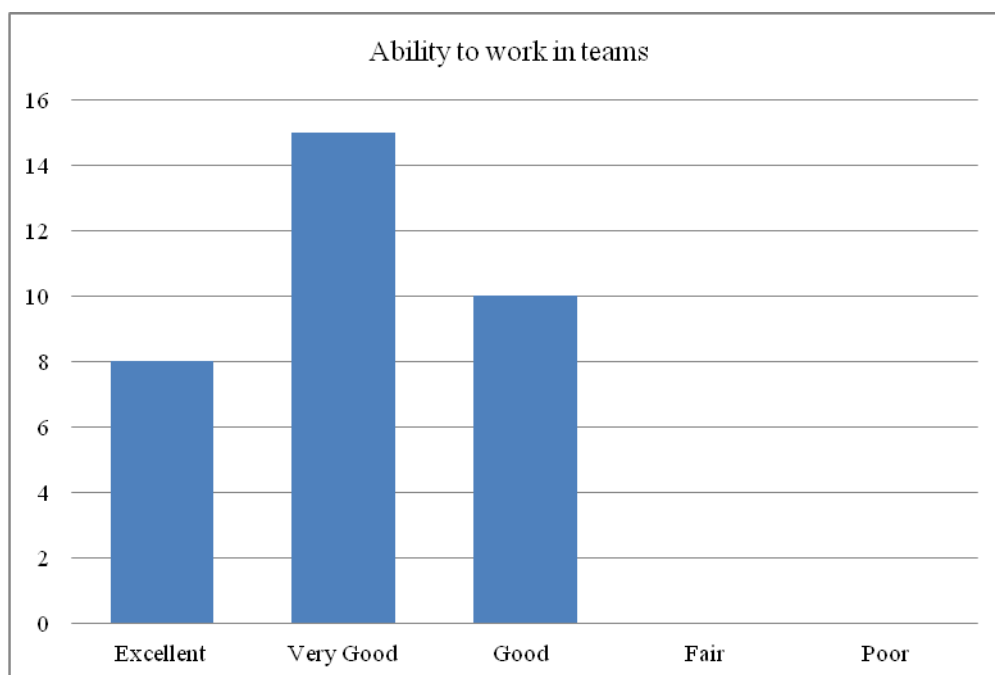


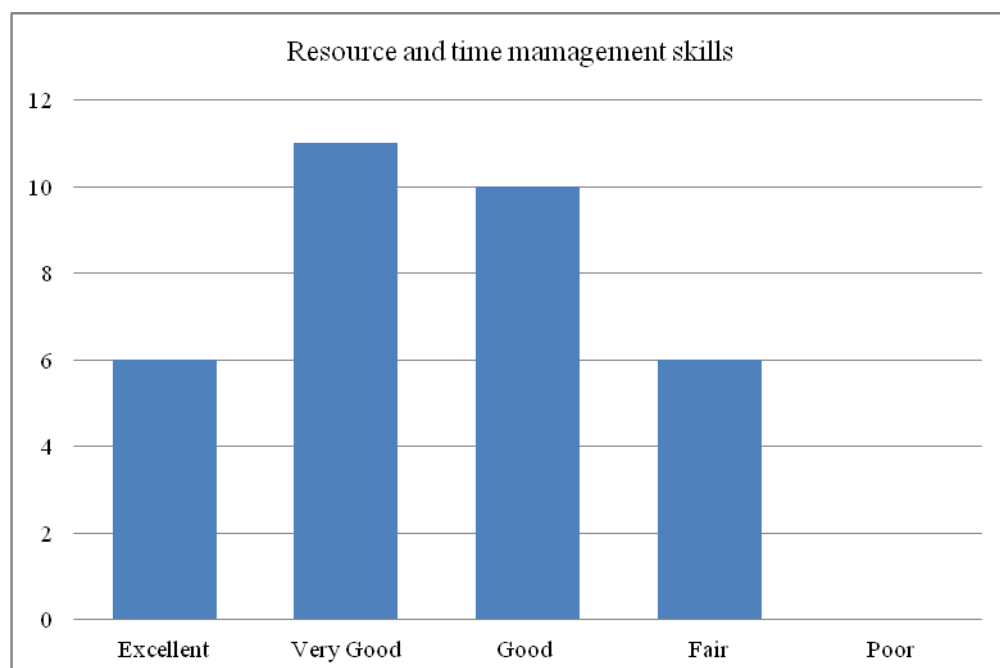
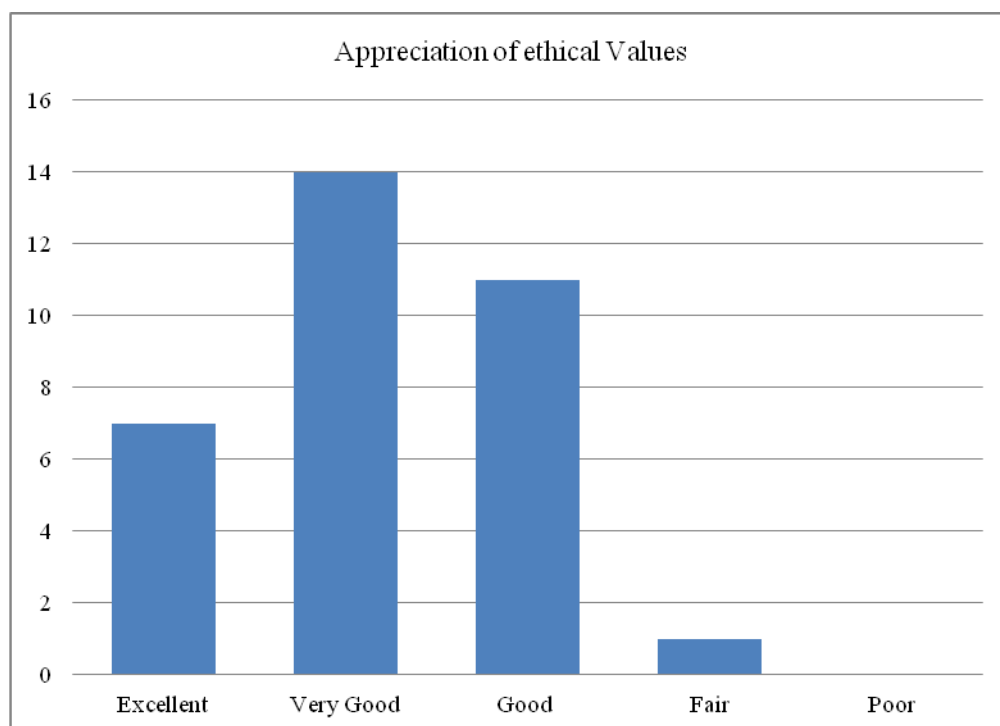


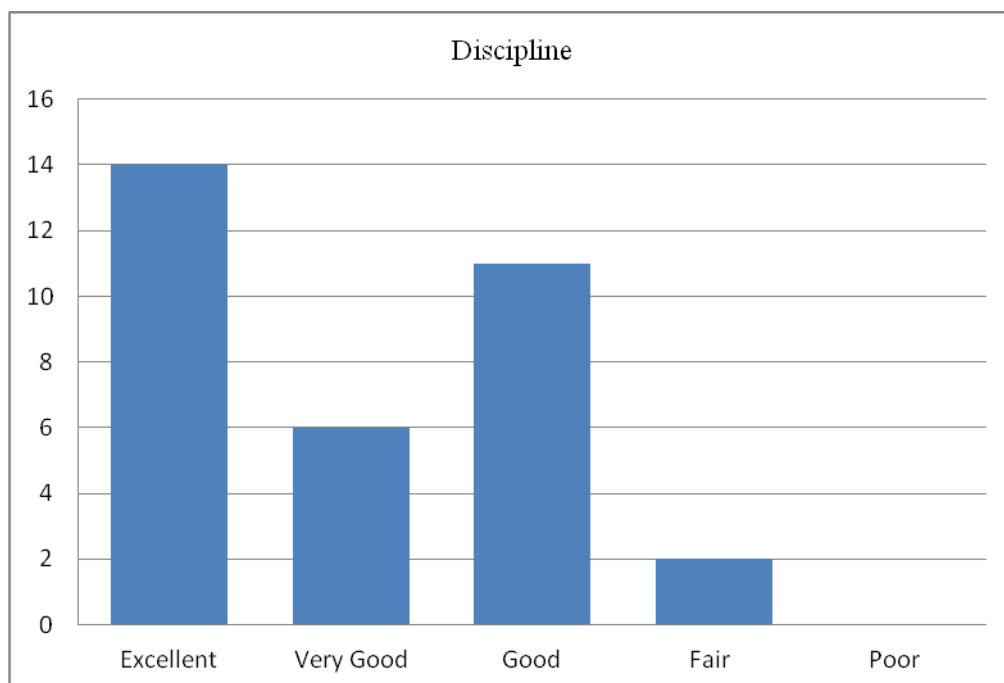
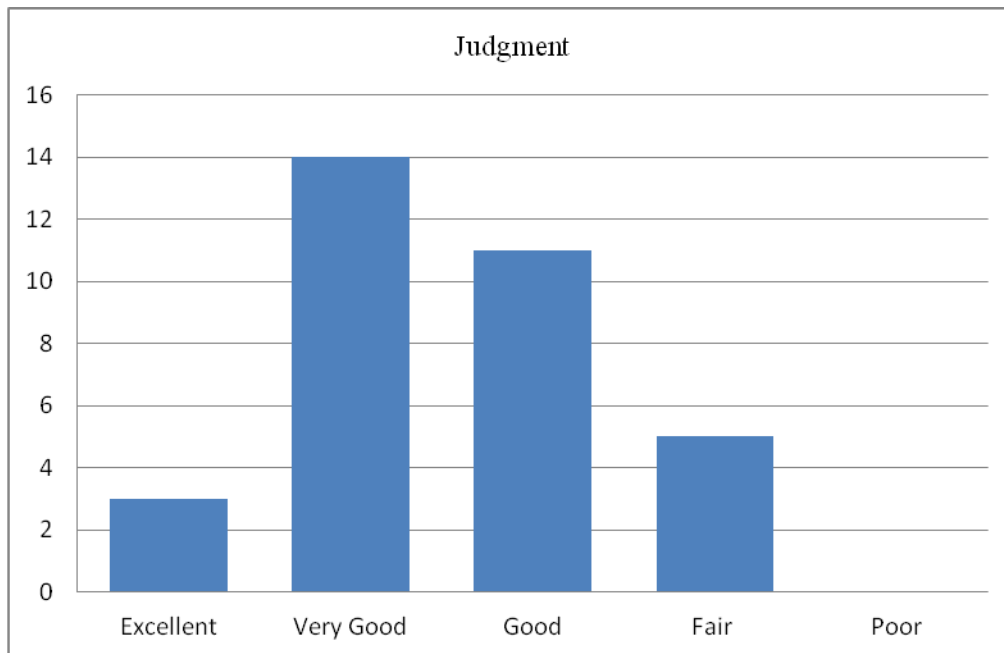


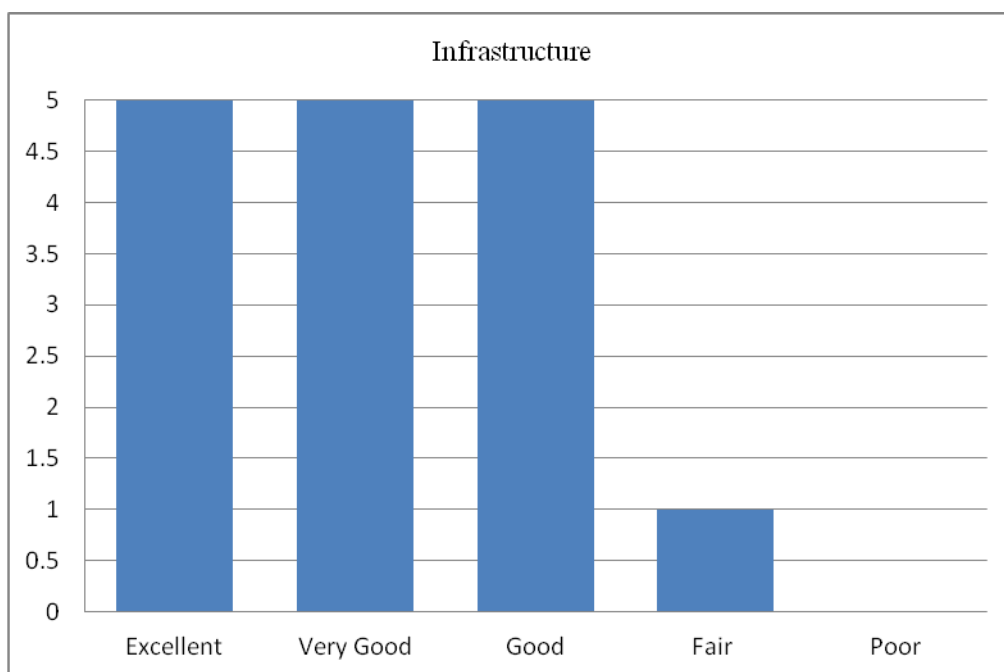


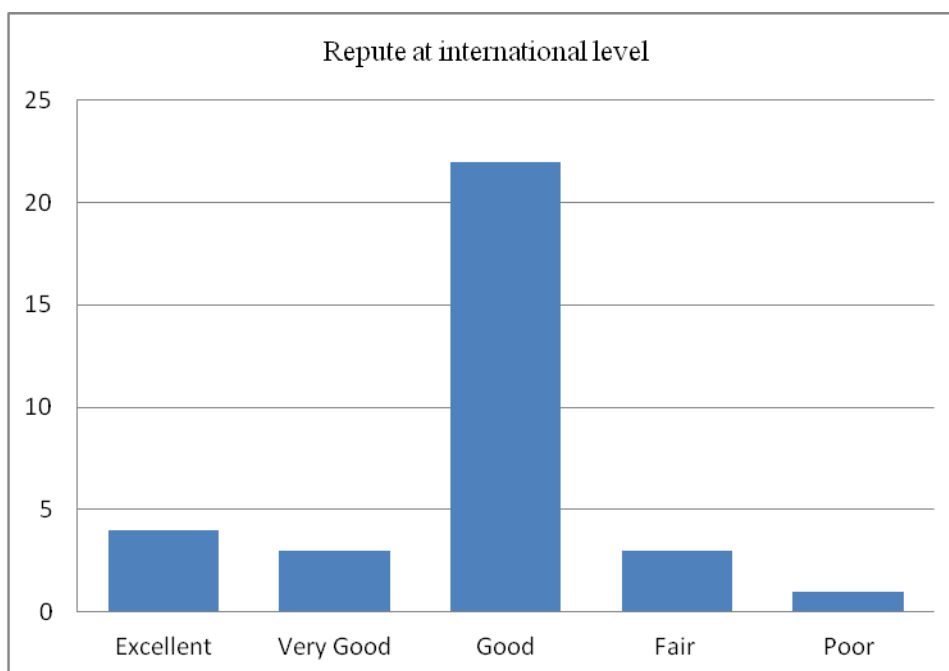
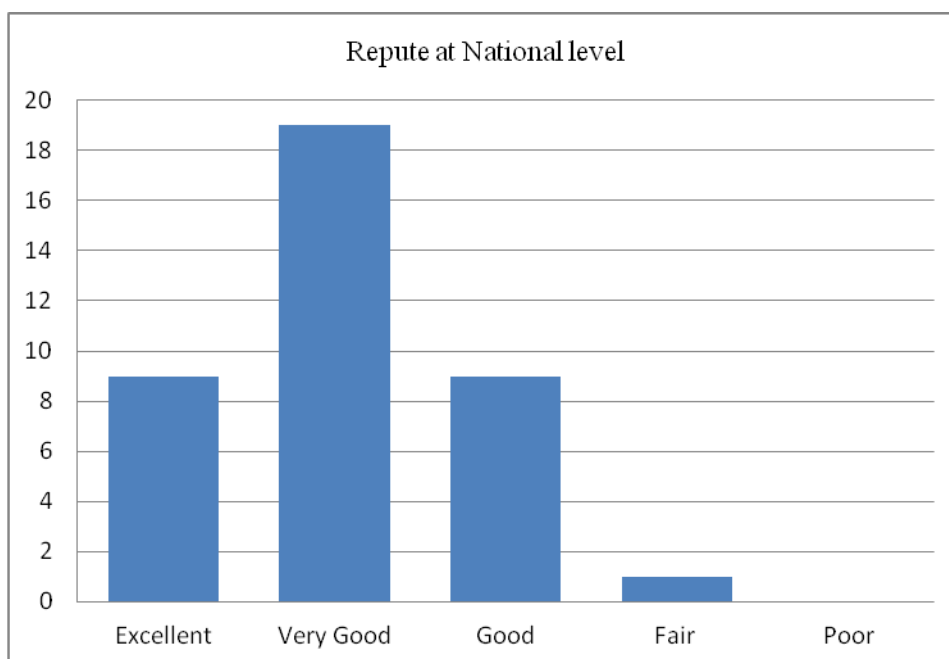








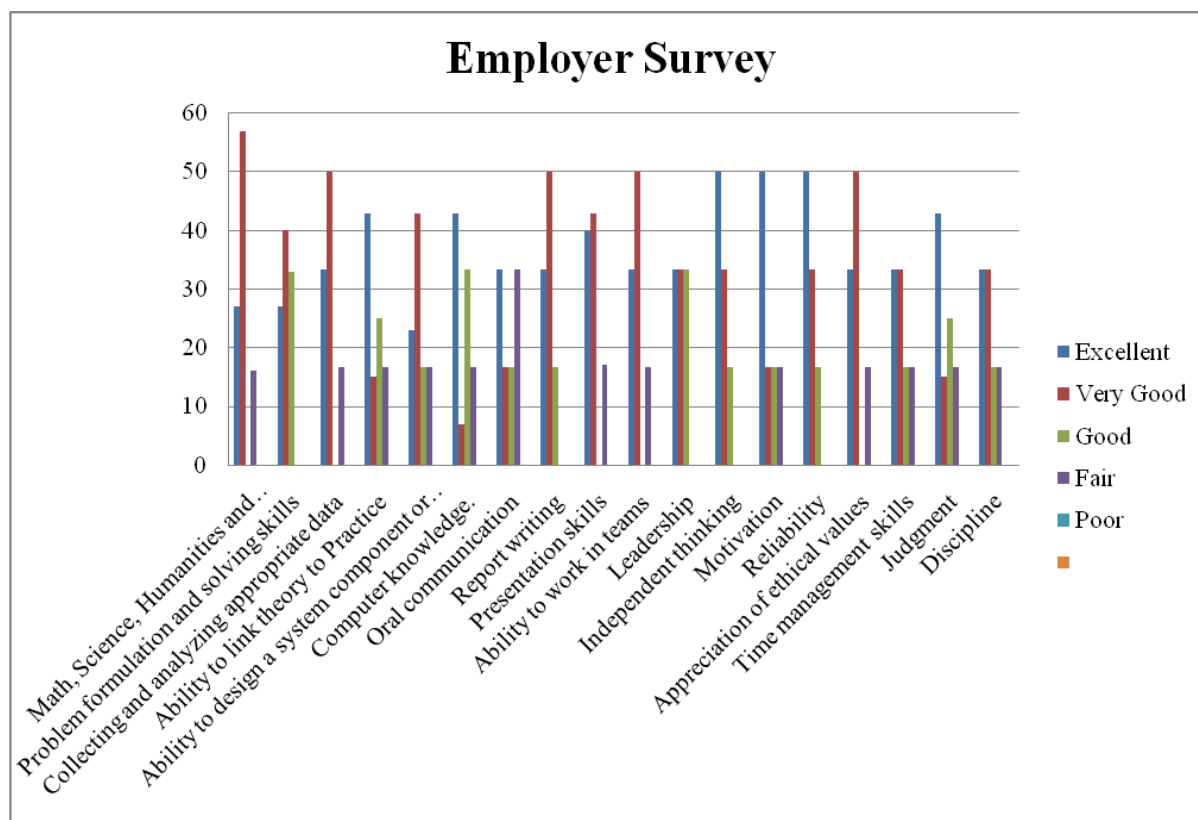




ANNEXURE-VII

Proforma 8: Employer Survey

The following is the graph is of Employer Survey of PhD. Biochemistry. The responses were evaluated on working skills, interpersonal skills, knowledge, and communication skills of employee.



The values on the X and Y axis are represented as percent of professional skill analysis of the alumni as assessed by their employers. The graduating students are employed in various public and private organization of the country. A few are working on research projects and the rest are associated with education sector and general public institutes

ANNEXURE -VIII**Faculty Resume**

Name	Prof. Dr. S. M. Saqlan Naqvi
Designation	Professor/ Dean Sciences
Research Interest	RESEARCH INTERESTS Tissue culture for genetic transformation Cloning of genes, cDNAs and regulatory elements and their application in agriculture/food industry. Construction of transgenic plants for improved agricultural productivity. Bioinformatics & Nanobiotechnology; applications, teaching and tools development
Publication	Latest Publications
1. P. Anwar, A. Bendini, M. Gulfraz, R. Qureshi, E Valli, G. di Lecce, S.M.S. Naqvi. T.G. Toschi. (2013). Characterization of wild olive (<i>Olea ferruginea</i>) oils from Pakistan. <i>Food. Res. Int.</i>, 54(2):1965-1971. 2. T. Mahmood, R. Aslam, S. Rehman, S.M.S. Naqvi. (2013). Molecular markers assisted genetic characterization of different salt tolerant plant species. <i>J. Anim. Plant Sci.</i>, 23 (5): 1441-1447 3. F. Shamim, G.N. Johnson, S.M. Saqlan Naqvi, A. Waheed. (2013). Higher antioxidant capacity protects photosynthetic activities as revealed by Chl a fluorescence in drought tolerant tomato genotypes. <i>Pak. J. Bot.</i>, 45(5): 1631-42 http://www.pakbs.org/pjbot/PDFs/45(5)/22.pdf 4. I. Rehman, F. Deebea, M. Irfan ul Haque, S. M. Saqlan Naqvi (2013). Inhibition of sesame seedling growth by <i>Xanthomonas campestris</i> pv. <i>Sesami</i> culture secretions. <i>J. Anim. Plant Sci.</i>, 23 (4):1207-1210. http://www.thejaps.org.pk/docs/v-23-4/39.pdf 5. F. Khan, T. Sultana, F. Deebea, S.M.S. Naqvi. (2013). Dynamics of mRNA of glycine-rich RNA-binding protein during wounding, cold and salt stresses in <i>Nicotiana tabacum</i>. <i>Pak. J. Bot.</i>, 45(SI): 297-300. http://www.pakbs.org/pjbot/PDFs/45(SI)/39.pdf 6. T. Mahmood, T. Yasmin, M.I. Haque and S.M.S. Naqvi. (2013). Characterization of a rice germin-like protein gene promoter. <i>Genet. Mol. Res.</i>, 12 (1): 360-369. DOI: 10.4238/2013.February.7.6 http://www.geneticsmr.com//year2013/vol12-1/pdf/gmr2097.pdf 7. H.Ahmed, M.R. Khan, R.P.-Fontan, C.L. Sandez, I. Mustafa, A. Ghani, M. Hussain, S. Asif, A. Ahmad, S.M.S. Naqvi, M. Qayyum. (2013). Prevalence of Bovine Hypodermosis in Water Buffalo (<i>Bubalus bubalis</i>) from Jhelum District, Pakistan. <i>Kafkas Univ Vet Fak Derg.</i>, 19(1): 79-84.	

DOI: 10.9775/kvfd.2012.7227

8. S.K.B. Naqvi, M.S. Ahmad, C.A. Rauf and S.M.S. Naqvi. (2013). Amplification and Sequencing of Internal Transcribed Regions 1& 2, and 5.8s rDNA from Local Isolates of *Fusarium* Species. *Pak. J. Bot.*, 45(SI): 301-307.
[http://www.pakbs.org/pjbot/PDFs/45\(S1\)/40.pdf](http://www.pakbs.org/pjbot/PDFs/45(S1)/40.pdf)
9. S.M.S. Naqvi, I. Batool, M.U. Farooq, F. Deebea, M.Z. Hyder, T. Mahmood. (2013). Seed grain polyphenol oxidase activities in wheat (*Triticum aestivum* L.). *Pak. J. Bot.*, 45(2): 407-410.
[http://www.pakbs.org/pjbot/PDFs/45\(2\)/08.pdf](http://www.pakbs.org/pjbot/PDFs/45(2)/08.pdf)
10. M. Naeem, I. Naveed, S.M.S. Naqvi, and T. Mahmood. (2013) Standardization of tissue culture conditions and estimation of freescavenging activity in *viola odorata* L. *Pak. J. Bot.*, 45(1):197-202.
[http://www.pakbs.org/pjbot/PDFs/45\(1\)/27.pdf](http://www.pakbs.org/pjbot/PDFs/45(1)/27.pdf)
11. F. Munir, S.M.S. Naqvi, Tariq Mahmood. (2013). In vitro and in silico characterization of *Solanum lycopersicum* wound inducible proteinase inhibitor-II gene. *Turk J Biol.*, 37: 1:10.
<http://journals.tubitak.gov.tr/biology/issues/biy-13-37-1/biy-37-1-1-1111-23.pdf>
12. Batool,S.,M.J.Asad,S.M.S.Naqvi,R.T.Mahmood,A.Guffar,M.Gulfraz andS.H.Hadri.2013.Production and partial purification of pectin lyase by *Aspergillus niger* grown on orange peels.*Afr.J.Microbiol.Res.*7(13): 1144-1149. (J.Impact Factor: 0.539)

Name	Prof. Dr. Muhammad Gulfraz
Designation	Professor/ Chairman
Research Interest	Natural Product Chemistry Isolation Purification and analysis of active ingredients for drug discoveries Fermentation Biotechnology Production of Bioethanol and Biodiesel from agriculture waste and plant sources
Publications	1. Hina gul , Mushtaq, Nabila sarwar, Saima Khalid Abbasi, Muhammad Shaeerz Ahmad and Muhammad Gulfraz.2014. Phytochemical analysis and biological activities of Diospyros lotus L. fruit extracts. Int. J. Pharmaceutical chemistry J. DOI 10.7439. 04 (03). Impact factor 0.4 2. I.Hayat, A. Ahmad, A. Ahmed S. Skhail and M. Gulfraz.2014. Exploring the potential of red kidney beans (Phaseolus Vulgaris L.) to develop protein based product for food application. The Journal of Animal and plant Science,24 (3).pp 860 -868. Impact factor 0.3 3. Abdul Rehman, Muhammad Gulfraz , Ghazala Kaukab Raja, Muhammad Inam ul Haq and Zahid Anwar.2014. A Comprehensive Approach to Utilize an Agricultural Pea peel (Pisum 2 sativum) Waste as a Potential Source for Bio-ethanol Production. Romanian Journal of Biotechnology Letter (Accepted). 4. Sajid Mehmood, M.Gulfraz,M.S. Tahir,M.S.Rehman, T.Aqil and T. Mehmood. 2014. Statistical screening and selection of sweet sorghum varieties for Bio ethanol production.Pak.J.Bot 46(3)1115-1120. Impact factor 0.9 5. Dawood Ahmad, M.Gulfraz, M.Shareez Ahmad, habiba Nazir, Hina gul and Saira Asif.2014. Protective action of Taraxacum officinale on CCL4 induced hepato toxicity in rats. African Journal of Pharmacology 8(30)pp.775-780. Impact factor 0.5 6. Muhammad Gulfraz, Muammad Imran, Sobia Khadam, Dawood Ahmed, Muhammad J. Asad, Kashis S. Abassi, Muhammad Irfan and Sajid Mehmood.2014. A comparative study of antimicrobial and antioxidant activities of garlic (Allium sativum L.) extracts in various localities of Pakistan. African Journal of plant Sciences vol.8 Impact factor 0.5 7. Atif Kamal, Khansa Qamar, Muhammad Gulfraz, Muhammad Asad Anwar, Riffat Naseem Malik. 2014. PAH exposure and oxidative stress indicators of human cohorts exposed to traffic pollution in Lahore city (Pakistan).

Chemosphere. 120 (2015)59-67.Impact factor 3.5

8. Zahid Anwar, Muhammad Gulfraz and Muhammad Irshad. 2014. Agro-Industrial lignocellulosic biomass a key to unlock the future bioenergy : A brief review. J Radiation Research and applied Sciences, pp 1-11. Impact factor 0.5

9. Dawood Ahmad, M.Gulfraz, M.Shareez Ahmad, Rahmatullah, M. Tahir and Pervez.2013. Cytoprotective potential of methanolic leaves extract on *Taraxacum officinale* on CCl₄ induce Rates. Pensee Journal. 75:11Nove.2013.), pp. 749-757. Impact factor 0.05

10. Pervez Anwar, Alessandra Bendini, Muhammad Gulfraz, Rahmatullah Qureshi, Enrico Valli, Giuseppe Di Lecee, S.M. Saqlan Naqvi and Tullia Gallna Toschi.2014. Characterizaton of wild olive (*Olea ferruginea*) oils from Pakistan. Food Research International, 54:1965-1971.Impact factor 3.5

11. M.Gulfraz, Dawood Ahmad, M.Shareez Ahmad, Rahmatullah, M. Tahir Raja , Nyla Jabeen and Kashi Sarfraz Abbasi.2013. Effect of leaf extracts of *Taraxacum officinale* on CCl₄ induce Hypatotoxicity in rats. Pakistan Journal of Pharmaceutical Sciences.27(4) 825-829. Impact factor 0.9

12. Humaira Shaheen, Rahmatullah Quershi, Abida Akram, M.Gulfraz and Daniel Potter.2013. A Preliminary Floristic Checklist of Thal Desert Punjab, Pakistan.Pak.J.Bot. 46(1):2-7. Impact factor 0.9

13. Mirza Imran Shahzad, Imran Hamayun Khan, Paul A. Luciw, Muhammad Gulfraz and Azra Khanum. 2013. Cloning, Expression and Genetic Immunization Studies of Mycobacterium tuberculosis Gene esat6. Pakistan J. Zool., vol. 45(3) Impact factor 0.5

14. Sidra Batool, M. Javaid Asad, S. M. Saqlan Naqvi· Raja Tahir Mahmood, A. Guffar, M. Gulfraz and Saqib H. Hadri:2013. Production and partial purification of pectin lyase by *Aspergillus niger* grown on orange peles. African Journal of Microbiology Research Vol. 7(13), pp. 1144-1149. Impact factor 0.54

15. Gul Rahim, Rahmatullah Qureshi, M. Arshad and Muhammad Gulfraz.2013. Phytochemical Analysis and Antioxidant Properties of *Teucrium stocksianum* Flower from Malakand Division, Pakistan. International journal of agriculture & biology. 15 (2): 377–381 Impact factor 0.6

16. Umara Afzal, Muhammad Gulfraz, Shahzad Hussain, Farnaz Malik,Sadaf Maqsood, Imam Shah and Sidra Mahmood.2013. Hepatoprotective effects of *Justicia adhatoda* L. against carbon tetrachloride (CCl₄) induced liver injury in Swiss albino mice. African Journal of Pharmacy and Pharmacology Vol. 7(1), pp. 8-14.Impact factor 0.869

17. Sadiq Noor Khan, Stefan Niemann, Muhammad Gulfraz, Mazhar Qayyum, Saima Siddiqi, Zahid, Sharif Mirza, Sabira Tahsin, Mina Ebrahimi-Rad and Azra Khanum. 2013. Molecular Characterization of Multidrug-Resistant Isolates of
18. *Mycobacterium tuberculosis* from Patients in Punjab, Pakistan. Pak. J. Zool. 45(1), pp. 93-100. Impact factor 0.5
19. Hafeez Ullah, Feroza Hamid Wattoo, Muhammad Hamid Sarwar Wattoo, Muhammad Gulfraz, Syed Ahmad Tirmizi, Sadia Ata, Abdul Wadood. 2012. Synthesis, spectroscopic characterization and antibacterial activities of three Schiff bases derived from dehydroacetic acid with various substituted anilines. Turkish Journal of Biochemistry. 37 (4): 386–391. Impact factor 0.3
20. Abid Mahmood, Ghazala Kaukab Raja, Tariq Mahmood, Muhammad Gulfraz and Azra Khanum. 2012. Isolation and Characterization of antimicrobial activity conferring components from seed of bitter ground (*Momordica charantia*). Medicinal Plant Research 64(4), 566-573. Impact factor 0.6
21. Muhammad Imran, Muhammad Javaid Asad Muhammad Gulfraz, Rahmatullah Qureshi, Hina Gul, Nazish Manzoor and Arshad Nawaz Ch. 2012. Hyper production of glucoamylase by *Aspergillus niger* through solid state fermentation. Pak Bot. 44(6): 2103-2110. Impact factor 0.9
22. Mehmooda Munazir, Rahmatullah Qureshi¹, Muhammad Arshad and Muhammad Gulfraz. 2012. Antibacterial activity of root and fruit extracts of *Leptadenia pyrotechnica* (asclepiadaceae) from Pakistan. Pak. J. Bot., 44(4): 1209-1213. Impact factor, 0.94
23. Abdus Sattar Tariq, Zahid Akram¹, Ghulam Shabbir, Muhammad Gulfraz, Khalid Saifullah Khan, Muhammad Shahid Iqbal¹ and Talat Mahmood. 2012. Character association and inheritance studies of different sorghum genotypes for fodder yield and quality under irrigated and rainfed conditions. Afri. J. Biot Vol. 11(38), pp. 9189-9195. Impact factor 0.57
24. Muhammad Irshad, Zahid Anwar, Muhammad Gulfraz, Hamama Islam Butt,
25. Amir Ejaz, and Haq Nawaz. 2012. Purification and characterization of α -amylase from *Ganoderma tsuaga* growing in waste bread medium. Afri. J. Biotech. Vol. 11(33), pp. 8288-8294. Impact factor 0.57
26. Zahid Anwar, Muhammad Gulfraz, Muhammad Imran, Muhammad Javaid Asad, Aftab Iqbal Shafi, Pervaz Anwar and Rehmat ullah Quershi. 2012. Optimization of Dilute acid pretreatment using response surface methodology for bioethanol production from Cellulosic Biomass of rice polish. Pak. J. Bot., 44(1): 169-176. Impact factor 0.94
27. Humaira Shaheen, Rahmatullah Qureshi, Abida Akram and Muhammad Gulfraz. 2012. Some important medicinal flora of Noorpur Thal Khushab, Pakistan. Archives Des Sciences. Vol 65 (2); 57-73 Impact factor 0.7
28. Shahzad, M.I., Khan, I.H., Luciw, P.A., Gulfraz, M and Khanum, A. 2012.

Cloning expression and genetic immunization studies of Mycobacterium tuberculosis gene esat 6. *PJZ*, Vol(44). Impact factor 0.338

29. Zahid Anwar, Muhammad Gulfraz, M. Javaid Asad, Muhammad Imran, Zahid Akram Sajid Mehmood², Abdul Rehman¹, Pervez Anwar¹ and Alia Sadiq. 2012 Bioethanol productions from rice polish by optimization of dilute acid pretreatment and enzymatic hydrolysis. *African J. Biot.* Vol(4), pp.992-998. Impact factor 0.57
30. Farzana S, Kiran SK, Asif A, Anwar A, M. Gulfraz and Feroza HW. 2012. Development and Optimization of sweet cream butter from buffaloes at cottage scale. *African J. Biot.* Vol (75), pp.17265-17274 . Impact factor 0.57
31. Gul R, Rahmatullah Q, Gulfraz M, M. Arshad and Sahib R. 2012. Preliminary phytochemical screening and ethnomedicinal uses of *Teucrium stocksianum* from Malakand Division. *J. Med. plants Res.* vol 6(5), pp.704-707. Impact factor 0.5
32. Sajida Zafar, Anwaar Ahmed, Riaz Ahmad, Muhammad Atif Randhawa, Muhammad Gulfraz, Asif Ahmad, and Farzana Siddique. 2012 Chemical residues of some pyrethroid insecticides in egg plant and okra fruits: effect of processing and chemical solutions. *J. Chem. Soc. Pak* 34(5) 1169-1174. Impact factor 1.10

Name	Dr. Ghazala Kaukab Raja
Destination	Associate Professor
Research Interest	Exercise Biochemistry, Metabolism, Genetic polymorphism
Publications 1. Philip E Stuart, Trilokraj Tejasvi, Pakeeza A Shaiq, Preya Kullavanijaya, Raheel Qamar, Ghazala K Raja, Yanming Li, John J Voorhees, Gonçalo R Abecasis, James T Elder and Rajan P Nair (2014). A Single SNP Surrogate for Genotyping HLA-C*06:02 in Diverse Populations. J Invest Dermatol. doi:10.1038/jid.2014.517 2. Ghazala K. Raja, Mark A. Sarzynski, Peter T. Katzmarzyk, William D. Johnson, Yourka Tchoukalova, Steven R. Smith, Claude Bouchard. (2014) Commonality versus specificity among adiposity traits in normal-weight adults. Int J Obes (Lond). 38(5):719-23. doi: 10.1038/ijo.2013.153. Epub 2013 Aug 16. 3. Iffat Tahira, Muhammad Saqlain, Abid Mahmood, Nafeesa Qudsia Hanif, Ghazala Kaukab Raja. (2014) Study of β-Lactoglobulin Milk Protein Variants in Buffalo. Pakistan J. Zool. 46(2): 549-552 4. P.A. Shaiq, P.E. Stuart, A. Latif, C. Schmotzer, A.H. Kazmi, M.S. Khan, M. Azam, T. Tejasvi, J.J. Voorhees, G.K. Raja, J.T. Elder, R. Qamar, R.P. Nair. (2013) Genetic Associations of Psoriasis in a Pakistani Population. British J. Dermatol. 169(2):406-11. doi: 10.1111/bjd.12313. 5. P. A. Akram, A. Klausegger, A. Latif, J. W. Bauer, R. Qamar and G. K. Raja. (2012) Missense Mutation in LAMA3 Associated with Herlitz Junctional Epidermolysis Bullosa in a Pakistani Family. Pak. J. Zool. 44(6): 1697-1702 6. Shahid Mahmood Baig;Dure Sabih;Kashif Rahim;Aysha Azhar;Muhammad Tariq; Muhammad Sajid Hussain; Syed Muhammad Saqlan Naqvi; Ghazala Kaukab Raja;Tahir Naeem Khan; Muhammad Jameel;Zahra Iram; Samiya Noor; Usman Raza Baig; Javed Anver Qureshi; Shehla Anjum Baig; Syeda Marriam Bakhtiar. (2012). β-Thalassemia in Pakistan: a pilot program on prenatal diagnosis in Multan. J. Pediatr. Hematol and Oncol. 39: 90-92 7. Pakeeza A. Shaiq, Alfred Klausegger, Fawad Muzaffar, Johann W. Bauer, Muhammad I. Khan, Azra Khanum, Raheel Qamar and Ghazala K. Raja. (2012). Founder mutation c.676insC in three unrelated kindler syndrome families belonging to a particular clan from Pakistan. J. Dermatol. 39: 1-2	

Name	Dr. Muhammad Javaid Asad
Destination	Associate Professor
Research Interest	Fermentation process development Bioconversion of lignocellulosic biomass and production of amylases, cellulases and lignases, single cell protein, organic acids and other industrial products. Biocatalysis: Enzyme kinetics, purification, characterization, enzyme engineering, immobilization and industrial application of microbial enzymes; Liquid and solid waste management. Bioremediation of textile dyes and industrial effluents by white rot fungi, Biodiesel, Bioenergy and Nutrition.
Publications 1. Mehboob, N., M. J. Asad, M. Asgher, M. Gulfraz, T. Mukhtar and R. T. Mehmood. 2014. Exploring Thermophilic Cellulolytic Enzyme Production Potential of <i>Aspergillus fumigates</i> by the Solid-State Fermentation of Wheat Straw. <i>Appl. Biochem. Biotechnol.</i> DOI 10.1007/s12010-014-0796-3. 2. Amin, Noor., R. T. Raja, M. J. Asad, M. Zafar and A. M. Raja. 2014. Evaluating Urea and Creatinine Levels in Chronic Renal Failure Pre and Post Dialysis: A Prospective Study. http://www.researchpub.org/journal/jc vd/jc vd.html 3. Mahmood, R. T., M. J. Asad, N. Mehboob, M. Mushtaq, M. Gulfraz, M. Asgher, N. M. Minhas and S. H. Hadri. 2013. Production, purification and characterization of Exoglucanase by <i>Aspergillus fumigates</i>. <i>Appl. Biochem. Biotechnol.</i> 170:895–908 (DOI 10.1007/s12010-013-0227-(J. Impact Factor: 1.943) 4. Batool, S., M. J. Asad, S. M. S. Naqvi, R. T. Mahmood, A. Guffar, M. Gulfraz and S. H. Hadri. 2013. Production and partial purification of pectin lyase by <i>Aspergillus niger</i> grown on orange peels. <i>Afr. J. Microbiol. Res.</i> 7(13): 1144-1149. (J. Impact Factor: 0.539) 5. Ata, S., F. H. Wattoo, M. Feroz, M. H. S. Wattoo, S. A. Tirmizi and M. J. Asad. 2013. Analytical investigation of selected pesticide residues from fruits and vegetables by an improved extraction method using reverse phase high performance liquid chromatography. <i>Ethiop. J. Environ. Studies Manag.</i> 6 (4):342-347. 6. Asgher, M., Iqbal, H. M. N. and M. J. Asad. 2012. Kinetic characterization of purified laccase produced from <i>Trametes versicolor</i> IBL-04 in solid state bio-processing of corncobs. <i>BioResouces</i>, 7(1):1171-1188. (J. Impact Factor: 1.418). 7. Anwar, Z., M. Gulfraz, M. Imran, M. J. Asad, A. I. Shafi, P. Anwar and R. U. Quershi. 2012. Optimization of dilute acid pretreatment using response surface methodology for bioethanol production from cellulosic biomass of rice polish. <i>Pak. J. Bot.</i>, 44(1): 169-176. (J. Impact Factor: 0.836). 8. Anwar, Z., M. Gulfraz, M. J. Asad, M. Imran, Z. Akram, S. Mehmood, A. Rehman, P. Anwar and A. Sadiq. 2012. Bioethanol production from rice polish by optimization of dilute	

acid pretreatment and enzymatic hydrolysis. *Afri.J.Biotechnol.*, 11 (4):992-998. (J. Impact Factor: 0.573).

9. Raza,A.,N.Zaman,B.G.Arshad,M.J.Asad,H.Aziz,S.N.Qureshi and J.Irfan.2012.Mutations in ISDR may be linked to HighVIREMIA and Virus Resistance toIFN-Alpha-2b But Responsiveto PEG-IFN-Alpha-2a. *Int. J Sci. Emerging Tec.*, 4(3):153-158.
10. N.Mehboob.,M.J.Asad,M.Asghar,M.Gulfraz and R. T. Mahmood. 2012. Cellulase production by *Aspergillus fumigatus* cultured on wheat straw waste.*Bioprocess J.*,11(3):38-43
11. Imran, M., M. J. Asad, S. H. Hadri and S. Mehmood. 2012. Production and industrial applications of laccase enzyme.*J.Cell.Mol.Biol.*,10(1):1-11
12. Mehmood.K.,F.H.Watoo,M.H.S.Watoo,M.Imran,M.J.Asad,S.A.Tirmizi and A.Wadood.2012. Spectrophotometric estimation of cobalt with ninhydrin.*Saudi J. Biol. Sci.*:19: 247–250

Name	Dr. M. Sheeraz Ahmed
Designation	Assistant Professor
Research Interest	Biochemistry, Plant Biotechnology.
Publications 1. Gulfraz, Muhammad; Ahamd, Dawood; Ahmad, Muhammad Sheeraz; Qureshi, Rehmatullah; Mahmood, Raja Tahir; Jabeen, Nyla; Abbasi, Kashif Sarfraz. Effect of leaf extracts of <i>Taraxacum officinale</i> on CCl₄ induced Hepatotoxicity in rats, in vivo study. <i>Pakistan Journal of Pharmaceutical Sciences</i>; 2014, 27(4), 825-829. Impact Factor: 0.95 2. Mukhtiar Hussain, Zia-Ur-Rehman, M Sheeraz Ahmad, Muhammad Altaf, Helen Stoeckli-Evans, Saqib Ali: Structural and biological studies of new monomeric, tetrameric, and polymeric organotin(IV) esters of 3-(benzo[d][1,3]dioxol-4-yl)propanoic acid. <i>Journal of Coordination Chemistry</i>, 2013. 66(5), 868 –880. Impact Factor: 2.224 3. Kanwal Batool, M. Sheeraz v Ahmad, Ch. Abdul Rauf, S.M. Saqlan Naqvi. Amplification and sequencing of internal transcribed regions 1,2, and 5.8 S RNA from local isolates of <i>Fusarium</i> species. <i>Pakistan Journal of Botany</i>, 2013, 45 (SI), 301-307. Impact Factor: 1.207 4. M Sheeraz Ahmad, S M Saqlan Naqvi, Sajida Mushtaq, Farzana Ramzan, Abdul Sami, Salma Batool, Ihsan-ul-Haq and Bushra Mirza: Phytochemical and biological evaluation of <i>Polygonum amplexicaule</i> rhizome extract, <i>Canadian Journal of Pure and Applied Sciences</i>, 2013, 7(3): 2303-2314. 5. Ihsan-ul-Haq, Nazif Ullah, Gulnaz Bibi, Semab Kanwal, Muhammad Sheeraz Ahmad, Bushra Mirza: Antioxidant and anticancer activities and phytochemical analysis of <i>Euphorbia wallichii</i> root extract and its fractions. <i>Iran. J. Pharm. Res.</i> 2012, 11 (1): 241-249. Impact Factor: 0.51	

Name	Dr. Feroza Hamid Wattoo
Designation	Assistant Professor
Research Interest	• To express and purify therapeutics using gene cloning techniques or isolate, purify antimicrobial peptide (s) against mammalian pathogens from vegetables like pea, keralaetc using conventional techniques • Development of Vaccine and Diagnostic method for tuberculosis • To understand signal transduction mechanisms in eukaryotic cell • To understand mechanism leads normal cell to become abnormal cell
Publications (1) S. Ata, F.H. Wattoo, M. Ahmed, M.H.S.Wattoo, S. A. Tirmizi, A. Wadood. "A method optimization study for atomic absorption spectrophotometric determination of total zinc in insulin using direct aspiration technique." 2014 Apr doi:10.1016/j.ajme.2014.03.004. (ISI Indexed Journal). (2) Krueger LA, Beitz DC, Onda K, Osman M, O'Neil MR, Lei S, Wattoo FH, Stuart RL, Tyler HD, Nonnecke B. "Effects of D-α-tocopherol and dietary energy on growth and health of preruminant dairy calves". J Dairy Sci. (2014) : S0022-0302(14)00237-9. doi: 10.3168/jds.2013-7315. (ISI Indexed Journal, JCR-2012 Impact factor 2.566). (3) S.Ata, F.H. Wattoo, I Qasim, M.H.S Wattoo, "Monitoring of anthropogenic influences on underground and surface water quality of Indus River at district Mianwali-Pakistan"., Turk J Biochem 3(1): 9–13,2013. (ISI Indexed Journal, JCR-2012 Impact factor 0.211). (4) S.Ata, F.H. Wattoo, Momina Feroz, M.H.S Wattoo, S.A Tirmizi, M.J Asad, "Analytical investigation of selected pesticide residues from fruits and vegetables by an improved extraction method using reverse phase high performance liquid chromatography", Ethiopian Journal of Environmental Studies and Management 6(4), 342-347, 2013 (ISI Indexed Journal). (5) K.Mahmood, F.H.Wattoo, M.H.S.Wattoo, M.Imran, M.J.Asad, S.A.Tirmizi, "Spectrophotometric Estimation of Cobalt with Ninhydrin" Saudi J. Biol. Sci.: 19(2):247–250, 2012. (ISI Indexed Journal, Sciencedirect). doi:10.1016/j.sjbs.2012.01.001) (6) M. H.S Wattoo, A. Quddos , A. Wadood, M. B. Khan , F.H.Wattoo, S.A. Tirmizi, K.Mahmood, "Synthesis, characterization and impregnation of lead sulphide semiconductor nanoparticle on polymer matrix" J.Saudi Chem Soc. 16: 257-261, 2012. (ISI Indexed Journal; JCR-2012 Impact Factor 1.288). (7) S.Ata, F.H.Wattoo, L.R.Sidra, M.H.S.Wattoo, S.A.Tirmizi Imran Din andI. U. Mohsin, "Biosorptive removal of lead and cadmium ions from aqueous solution: The use of carrot residues as low cost non-conventional adsorbent" :Turk J Biochem. 37(3): 272-279, 2012. (ISI Indexed Journal, JCR-2012 Impact factor 0.211). (8) Hafeez Ullah, F.H.Wattoo, M.H.S.Wattoo, M.Gulfraz, S.A.Trimzi, S. Ata and A.Wadood."Synthesis, spectroscopic characterization and antibacterial activities of	

Schiff bases derived from dehydroacetic acid with various substituted anilines”, Turk J Biochem. 37(4): 386-391, (2012). (ISI Indexed Journal, JCR-2012 Impact factor 0.211).

Name	Dr. Pakeeza Arzoo Shaiq
Designation	Assistant Professor
Research Interest	Human Genetics
Publications 1. Pakeeza A. Shaiq, Alfred Klausegger, Fawad Muzaffar, Johann W. Bauer, Muhammad I. Khan, Azra Khanum, Raheel Qamar, Ghazala K. Raja (2012). Founder mutation c.676insC in three unrelated Kindler syndrome families belonging to a particular clan from Pakistan. <i>J. Dermatol.</i> 39(7):640-1. 2. Pakeeza A. Shaiq, Alfred Klausegger, Amir Latif, Johann Bauer, Raheel Qamar and Ghazala Kaukab Raja (2012). Missense mutation in LAMA3 associated with Herlitz Junctional Epidermolysis Bullosa in a Pakistani family. <i>vol. 44(6), pp. 1697-1702.</i> 3. Pakeeza A. Shaiq, P.E. Stuart, A. Latif, C. Schmotzer, A. H. Kazmi, M. S. Khan, M. Azam, T. Tejasvi, J.J. Voorhees, G.K. Raja, J.T. Elder, R. Qamar, R.P. Nair (2013). Genetic Associations of Psoriasis in a Pakistani Population. <i>Br. J. Dermatol.</i> doi: 10.1111/bjd.12313. 4. Pakeeza A. Shaiq, J. Klar, B. Bergendal and N. Dahl (2013). WNT10A mutations account for ¼ of population-based isolated oligodontia and show phenotypic correlations. <i>Am. J. Med. Genet. (A).</i> 164A(2):353-9. 5. J. Klar, A. Khalfallah, Pakeeza A. Shaiq, H. T. Gazda and N. Dahl (2014). Recurrent GATA1 gene mutations in Diamond-Blackfan anaemia. <i>Br. J. Haematol.</i> 166:949-51. 6. Schuster J., T. N. Khan, M. Tariq, P. A. Shaiq, K. Mäbert, S. M. Baig and J. Klar (2014). Exome sequencing circumvents missing clinical data and identifies a BSCL2 mutation in congenital lipodystrophy. <i>BMC med genet.</i> 15:71 doi:10.1186/1471-2350-15-71. 7. Philip E. Stuart, Trilokraj Tejasvi, Pakeeza A. Shaiq, Priya Kullavanijaya, Raheel Qamar, Ghazala K. Raja, Yanming Li, John J. Voorhees, Gonçalo R. Abecasis, James T. Elder, Rajan P. Nair (2014). A Single SNP Surrogate for Genotyping HLA-C:06:02 in Diverse Populations. (Accepted in <i>J Invest Dermatol.</i>, 10 December 2014; doi: 10.1038/jid.2014.517). 8. Muhammad Fiaz, Pakeeza A. Shaiq, Raja Muhammad Saqlain, Syed M. S. Naqvi, Bernard MY Cheung, Ghazala K. Raja (2014). Association of genetic variants of Apolipoprotein A5 gene with the Metabolic Syndrome in the Pakistani population. (Submitted to <i>J Biomedical Science</i>)	

Name	Dr. Sadia Saeed
Designation	Assistant Professor
Research Interest	i. Molecular Biology ii. Epigenetic iii. Human Immune System
Publications 1. Saeed S, Quintin J, Kerstens HH, Rao NA, Aghajani-refah A, Matarese F, Cheng SC, Ratter J, Berentsen K, van der Ent MA, Sharifi N, Janssen-Megens EM, Ter Huurne M, Mandoli A, van Schaik T, Ng A, Burden F, Downes K, Frontini M, Kumar V, Giamarellos-Bourboulis EJ, Ouwehand WH, van der Meer JW, Joosten LA, Wijmenga C, Martens JH, Xavier RJ, Logie C, Netea MG, Stunnenberg HG. Epigenetic programming of monocyte-to-macrophage differentiation and trained innate immunity. <i>Science</i>. 2014 Sep 26;345(6204):1251086. doi: 10.1126/science.1251086 2. Cheng SC, Quintin J, Cramer RA, Shepardson KM, Saeed S, Kumar V, Giamarellos-Bourboulis EJ, Martens JH, Rao NA, Aghajani-refah A, Manjeri GR, Li Y, Ifrim DC, Arts RJ, van der Meer BM, Deen PM, Logie C, O'Neill LA, Willems P, van de Veerdonk FL, van der Meer JW, Ng A, Joosten LA, Wijmenga C, Stunnenberg HG, Xavier RJ, Netea MG. mTOR- and HIF-1α-mediated aerobic glycolysis as metabolic basis for trained immunity. <i>Science</i>. 2014 Sep 26;345(6204):1250684. doi: 10.1126/science.1250684. 3. Mandoli A, Singh AA, Jansen PW, Wierenga AT, Riahi H, Franci G, Prange K, Saeed S, Vellenga E, Vermeulen M, Stunnenberg HG, Martens JH. CBFB-MYH11/RUNX1 together with a compendium of hematopoietic regulators, chromatin modifiers and basal transcription factors occupies self-renewal genes in inv(16) acute myeloid leukemia. <i>Leukemia</i>. 2014 Apr;28(4):770-8. doi: 10.1038/leu.2013.257. Epub 2013 Sep 4. 4. Saeed S, Logie C, Francoijs KJ, Frigè G, Romanenghi M, Nielsen FG, Raats L, Shahhoseini M, Huynen M, Altucci L, Minucci S, Martens JH, Stunnenberg HG. Chromatin accessibility, p300 and histone acetylation define PML-RARα and AML1-ETO binding sites in acute myeloid leukemia. <i>Blood</i>. 2012 Aug 24. doi: 10.1182/blood-2011-10-386086. 5. Quintin J*, Saeed S*, Martens JH, Giamarellos-Bourboulis EJ, Ifrim DC, Logie C, Jacobs L, Jansen T, Kullberg BJ, Wijmenga C, Joosten LA, Xavier RJ, van der Meer JW, Stunnenberg HG, Netea MG. <i>Candida albicans</i> Infection Affords Protection against Reinfection via Functional Reprogramming of Monocytes. <i>Cell Host Microbe</i>. 2012 Aug 16;12(2):223-32. (*both authors contributed equally) 6. Martens JH, Mandoli A, Simmer F, Wierenga BJ, Saeed S, Singh AA, Altucci L,	

Vellenga E, Stunnenberg HG. ERG and FLI1 binding sites demarcate targets for aberrant epigenetic regulation by AML1-ETO in acute myeloid leukemia. *Blood*. 2012 Sep 14. doi: 10.1182/blood-2012-05-429050.

7. Kleinnijenhuis J, Quintin J, Preijers F, Joosten LA, Ifrim DC, Saeed S, Jacobs C, van Loenhout J, de Jong D, Stunnenberg HG, Xavier RJ, van der Meer JW, van Crevel R, Netea MG. Bacille Calmette-Guerin induces NOD2-dependent nonspecific protection from reinfection via epigenetic reprogramming of monocytes. *Proc Natl Acad Sci U S A (PNAS)* 2012 Sep 17. doi: 10.1073/pnas.1202870109.
8. Saeed S, Logie C, Stunnenberg HG, Martens JH. Genome-wide functions of PML-RARalpha in acute promyelocytic leukaemia. *Review British J Cancer*. 2011;104:554-558.