PIR MEHR ALI SHAH
ARID AGRICULTURE UNIVERSITY RAWALPINDI

SELF-ASSESSMENT REPORT 2015-2017
BS (Geo-Informatics)

Institute of Geo-Information & Earth Observation

Prepared by: Members of Program Self-Assessment Team
Prof. Dr. Mobushir Riaz Khan (Coordinator)
Dr. Muhammad Hassan (Member)
Dr. Muhammad Imran (Member)
Mr. Naeem Abbas Malik (Member)
Mr. Muhammad Amin (Member)

CONTENTS

INTRODUCTION

Owing to increasing scope of geo-spatial technologies like Geographical Information System (GIS) and Remote Sensing (RS) and country's growing demand of skilled professionals of mentioned technologies, Bachelor of Science (BS) in Geo-Informatics program was launched by the worthy vice chancellor, Prof. Dr. Rai Niaz Ahmed in Fall semester 2015 under the Institute of Geo-Information & Earth Observation (IGEO) formerly department of Geo-Informatics. (BS) Geo-Informatics is an applied and professional program which is designed to enable students to qualify for relevant jobs in the industry, academia, or enroll in postgraduate programs.

The BS (Geo-Informatics) program of IGEO focuses on producing highly skilled professionals in the fields of GIS and RS which can manipulate spatial data to meet their requirement while solving real world problems. This undergraduate program is targeted towards students with intermediate education in Pre-Engineering, Pre-Medical, Pre-Agriculture or ICS. Students of this program are fostered with advanced theoretical & practical knowledge of GIS, RS and computer science (CS) subjects.

A well oriented scheme of studies meeting the national & international needs has been adopted. The BS program in Geo Informatics is comprised of 138 credit hours. The core courses cover aspects of introductory and advanced RS, basic and advanced GIS, Geo-Databases, Computer Science, Web GIS and applied RS & GIS.

This report is prepared based on eight criteria devised by HEC quality assurance team. This document highlights the salient features of BS Geo-Informatics program.

1. CRITERION 1: PROGRAM MISSION, OBJECTIVES AND OUTCOMES

The self-assessment is based on many criteria. This section describes how the standards of the Criterion 1 are met.

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

MISSION:

The mission of BS Geo-Informatics degree is to provide students with an intensive educational opportunity designed with the knowledge base of Geographic Information System (GIS) & Remote Sensing (RS) as well as practical experience on current software for processing and analyzing spatial data. The focus of the degree is to develop high quality application specialists with practical skills in a variety of commercially available software, and excellent written and oral communication skills. Graduates of this program will be able to successfully compete for a professional role in geo-spatial industry and get admission in world's best postgraduate schools.

PROGRAM OBJECTIVES:

Our BS Geo-Informatics program require its graduates to:

1. Demonstrate the concepts, ideas and techniques in the fields of GIS & Remote Sensing.
2. Have strong grasp on contemporary hardware & software commonly used for processing & analyzing spatial data.
3. Demonstrate problem solving skills by applying theoretical concepts and practical techniques.
4. Demonstrate the ability to get admission in best graduate school globally and acquire professional license or certifications in the geospatial industry.
5. Develop inter-personal, communication and analytical skills.

The program develops a strong practical and innovative knowledge of the subject area to enhance employment opportunities within earth observation and GIS communities, consultancies, private and public sectors. The program has basic introductory courses to lay the firm foundation of concepts and skills. It also offers a range of advanced and specialist modules. It extends the subject specific skills as well as general skills through practical classes, lectures and group tutorials. Students also must complete a final year project on a topic at the forefront of remote sensing and spatial analysis. Table 1 depicts how and when program objectives are measured, and actions taken.

Table 1: Assessment of program objectives

Sr. No	**Objective**	**How measured**	**When measured**	**Improvements Identified**	**Improvements Made**
1.	Demonstrate the concepts, ideas and techniques in the fields of GIS & Remote Sensing.	Quizzes, assignments, semester projects, and exams.	Regularly	Assignments & quizzes should be properly evaluated and returned.	Results of assignments and quizzes is shared with students.
2.	Develop strong grasp on GIS hardware and software.	Practical exams & projects.	Regularly	Students should be properly assessed about practical exam and term projects.	Proper evaluation of practical skills is ensured.
3.	Demonstrate problem solving skills.	Term projects and final year projects.	During semester and final year.	Innovative projects should come up.	Real world problems are being addressed.
4.	Ability to get admission in best graduate school globally and acquire professional certifications.	Quizzes, assignments, semester projects and theoretical, practical and viva exams.	Regularly	Every student should be given feedback about his/her studies.	More faculty may be hired.
5.	Develop inter-personal communication and presentation skills	Presentations, class discussions	Regularly	Projects presentations at conferences should be encouraged.	Students are motivated to undertake impressive projects.

Standard 1.2: The program must have documented outcomes for graduating students. It must be documented that the outcomes support the program objectives and that graduating students can perform these outcomes.

PROGRAM LEARNING OUTCOMES:

1. Knowledge and Understanding

Under knowledge and understanding domain, the program ambition is to develop the necessary skills of the students to effectively use spatial information for solving practical problems and giving alternate solutions by developing strong conceptual base. The program aims to develop student abilities to undertake individual research by identifying and solving practical problems using RS & GIS.

On successful completion of program, the students will be able to:

I. Understand technical issues relating to the acquisition, storage, management, analysis and display of spatial data;

II. Show their appreciation of the requirements of a variety of different user disciplines and enable the optimal use of GIS/RS technology; and

III. Propose, manage and report on project work, both as individuals and as team member.

The program specifically relates to subject knowledge in the following areas:

- Geographic information principles, which include spatial data structures their acquisition, pre-processing, geo-databases management and analyses.
- Importance of effective visualization techniques.
- Advanced spatial analysis in a varied range of subject domains.
- Programming and customization of remote sensing and GIS software.
- Effective distributed deployment of spatial data using web technologies.

2. Intellectual skills:

The program also has the ambition to develop strong intellectual skills among the graduates and require the students to.

I. Become a RS & GIS specialist with management and decision-making skills;
II. Make informed and critical judgments regarding geographic information management;
III. Appreciate and understand the spatial data and spatial analysis requirements of project;
IV. Apply knowledge and understanding to address a wide range of spatial issues.

3. Subject Practical skills:

The program specification requires students to:

I. have gained a practical knowledge of the range of techniques and strategies related to geographic information management;
II. be able to understand the complexity of spatial data and their relationships with non-spatial information;
III. be able to perform spatial analysis on a varied range of spatial data;
IV. have gained complete understanding of spatial data acquisition procedures;
V. be able to quantitatively assess the quality of acquired spatial data;
VI. be able to design, develop and evaluate methodologies and develop critics of them.

4. Transferable/ key skills:

The program also requires students to demonstrate knowledge in the following key skill areas:

I. Communication skills
II. Interpersonal and teamwork skills
III. Numeracy and IT skills
IV. Self-management and professional development skills

Table 2: Program Objectives versus Program Outcomes

PROGRAM OUTCOMES	PROGRAM OBJECTIVES				
	Demonstrate the concepts, ideas and techniques in the fields of GIS & Remote Sensing.	**Develop strong grasp on GIS hardware and software.**	**Demonstrate problem solving skills.**	**Ability to get admission in best graduate school globally and acquire professional certifications.**	**Develop inter-personal, communication and presentation skills**
Knowledge and Understanding	✓	✓	✓	✓	
Intellectual Skills	✓	✓	✓	✓	✓
Subject Practical Skills	✓	✓	✓	✓	✓
Transferrable/Key Skills		✓	✓	✓	✓

Program Assessment Results

Teacher's Evaluation

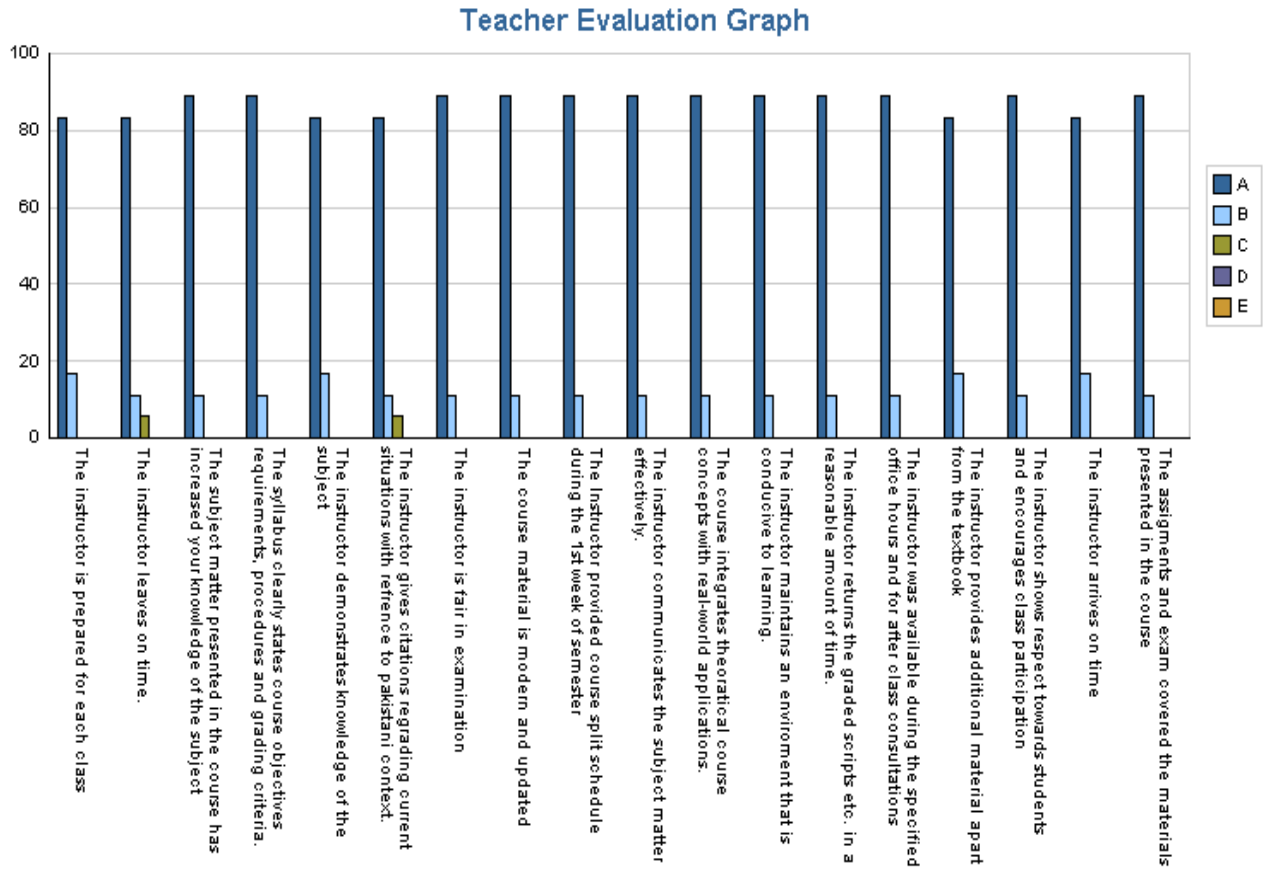
Following teachers were involved in teaching undergraduate courses namely:

1. Dr. Mobushir Riaz Khan, Professor
2. Dr. Muhammad Hasan Ali Baig, Assistant Professor
3. Dr. Muhammad Imran, Assistant Professor
4. Mr. Muhammad Amin, Lecturer
5. Mr. Naeem Abbas Malik, Lecturer
6. Ms. Mubashra Sultan, Visiting Faculty
7. Mr. Younas Khan, Visiting Faculty

All the teachers and courses were evaluated by the students at the end of the semester in accordance with proforma 10 & 1 devised by HEC. The graphical representation of evaluations done by students is given below. Students were asked to give opinion on the various indicators relating to instructor's performance and course delivery i.e. whether they strongly agree, agree, uncertain, disagree or strongly disagree. Feedback from the overwhelming majority was positive. Only very few students were uncertain and disagree about few indicators.

Prof. Dr. Mobushir Riaz Khan (RSG-301, Fall 2015)

Evaluation: 89 percent of the students strongly agreed that “the instructor communicates the subject matter effectively”, “the course material was modern and updated”, and “the instructor provides additional material apart from textbook “. 83% of the students agreed that “the instructor is prepared for each class, and " The instructor leaves on time and arrives on time "demonstrates knowledge of the subject ", "provides additional material apart from the text book".



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

General Comments of the Students about the Teacher

Strengths:

- The instructor communicates subject matter effectively
- The instructor demonstrates knowledge of the subject

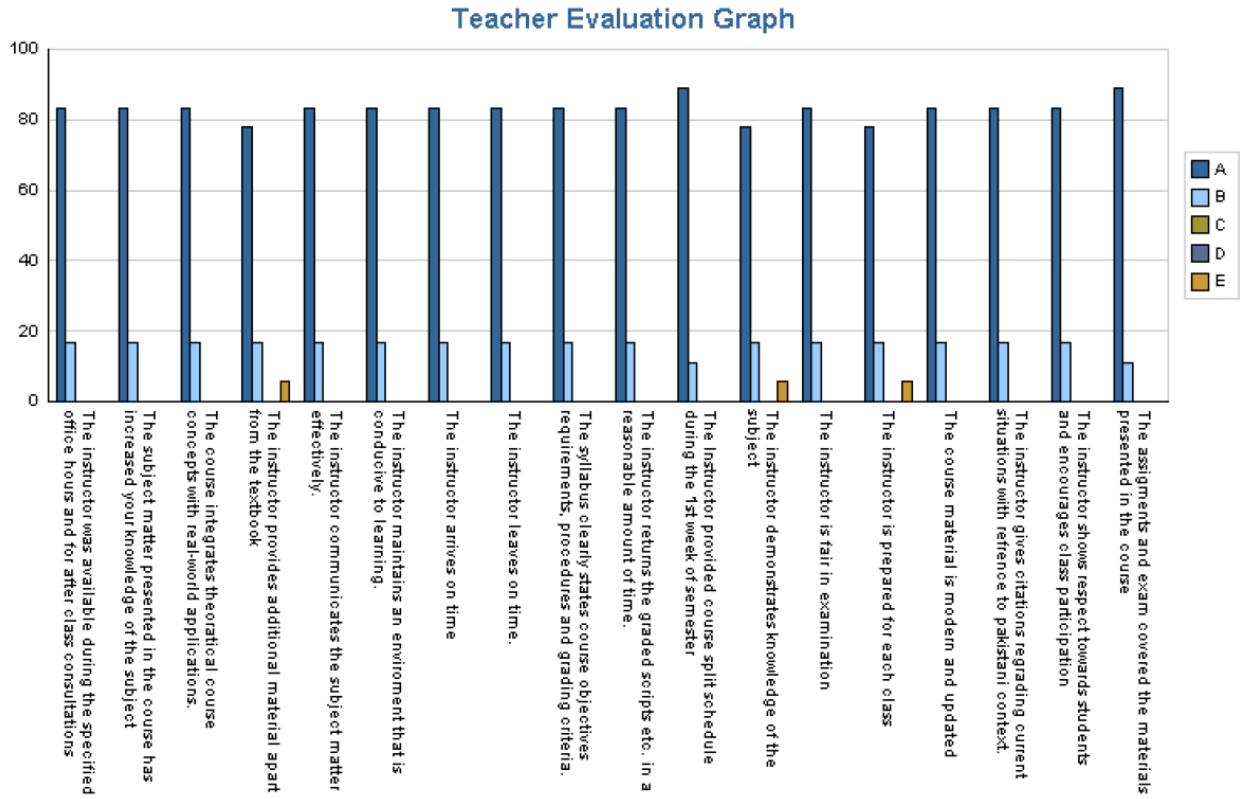
- The course integrates theoretical course concepts with real-world applications

Weakness:

- No significance weakness was found.

Mr. Muhammad Amin (RSG-303, Fall 2015)

Evaluation: The graph shows evaluation of the instructor. 89% percent of the students strongly agreed that “the instructor provide course split schedule in the first week of semester", assignments and exams covered the materials presented in the course". 83% of the students strongly agreed that “the instructor communicates the subject matter effectively”, “the course material was modern and updated”, and “the instructor provides additional material apart from textbook “. “the instructor maintains an environment that is conducive for learning”, “The instructor is fair in examination”, “The subject matter presented in the course has increased your knowledge of the subject”, "course integrates theoretical course concepts with real world applications" and “the instructor was available during the specified office hours”.



Where:

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

Strengths:

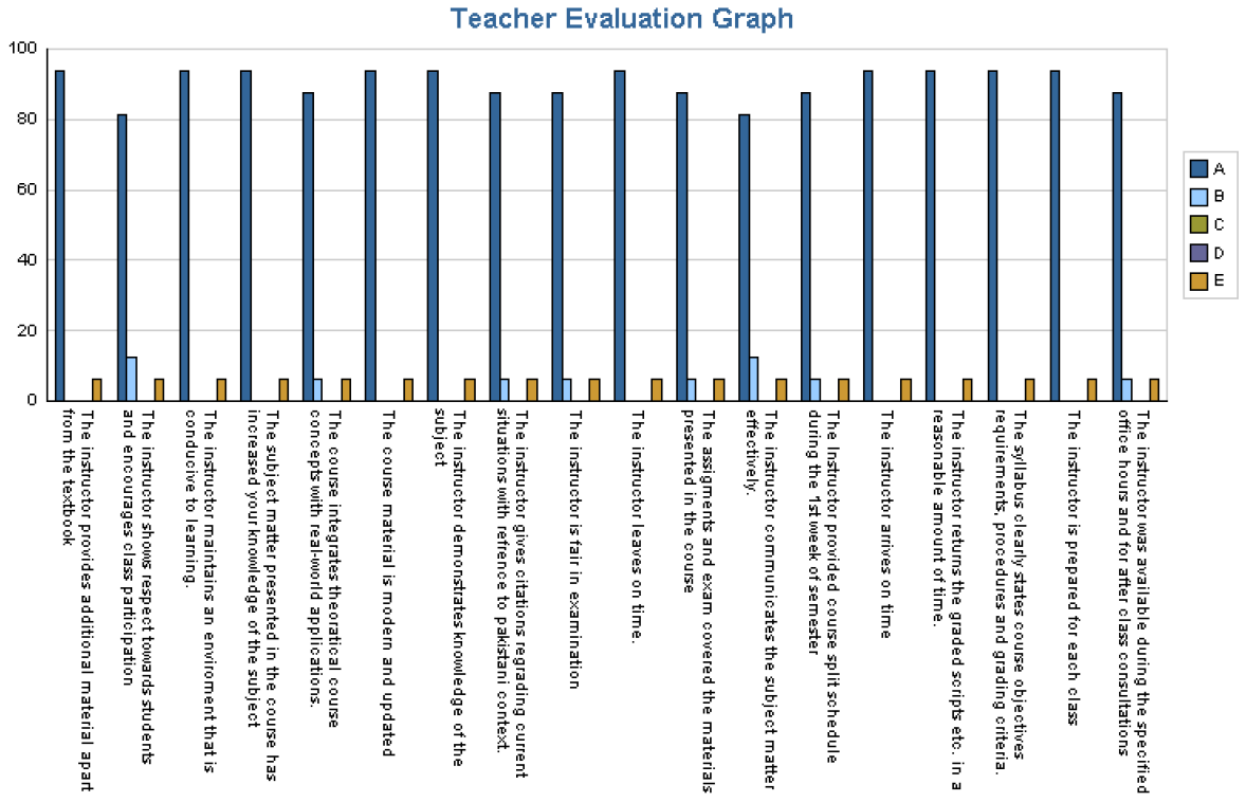
- the course material was modern and updated
- The instructor communicates subject matter effectively
- The instructor demonstrates knowledge of the subject
- The course integrates theoretical course concepts with real-world applications

Weakness:

- No significance weakness was found

Mr. Muhammad Amin (RSG-302, Spring 2016)

Evaluation: The graph shows evaluation of the instructor. 94% percent of the students strongly agreed that “the instructor communicates the subject matter effectively”, “the course material was modern and updated”, and “the instructor provides additional material apart from textbook “,"demonstrates knowledge of the subject". 88% of the students agreed that “the instructor maintains an environment that is conducive for learning”, “The instructor is fair in examination”, “The subject matter presented in the course has increased your knowledge of the subject”, "course integrates theoretical course concepts with real world applications" and “the instructor was available during the specified office hours”.



Where:

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

Strengths:

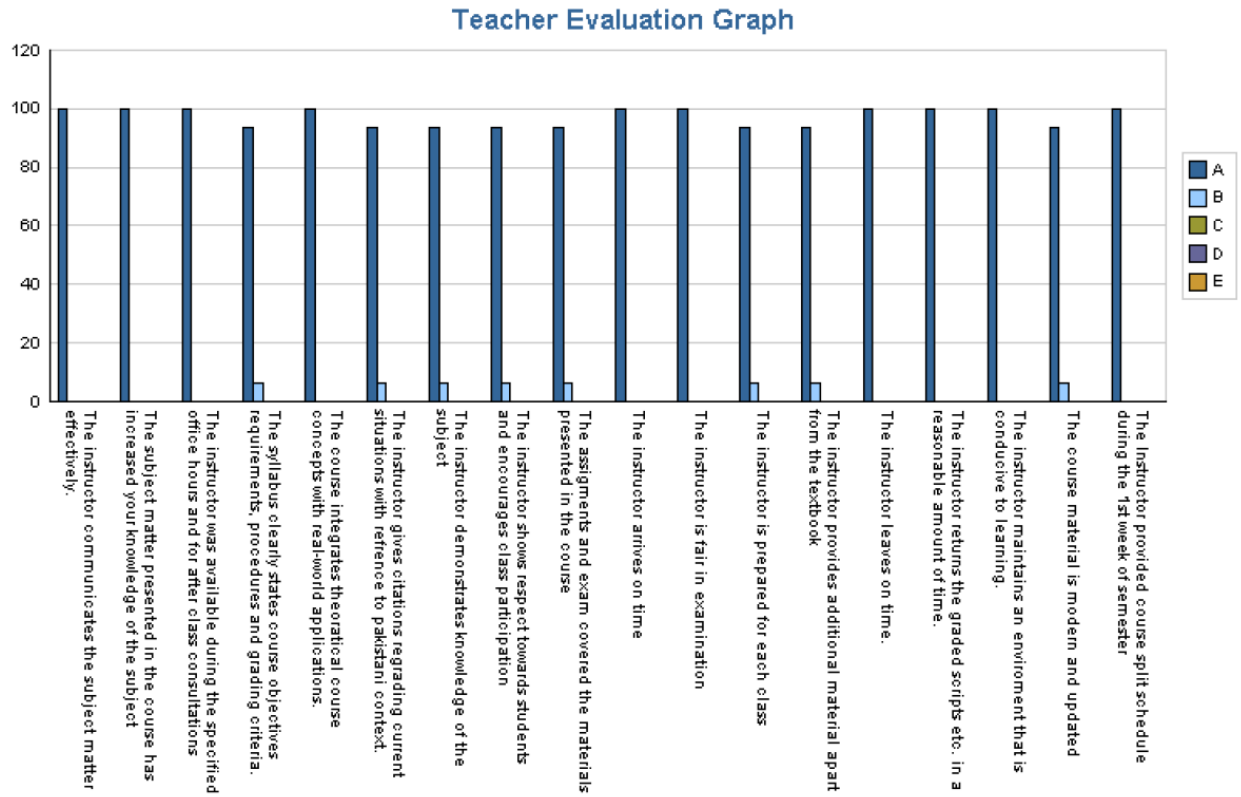
- The instructor maintains an environment that is conducive to learning.
- The course material was modern and updated
- The instructor demonstrates knowledge of the subject
- The subject matter presented in the course has increased the knowledge of the subject

Weakness:

- No significance weakness was found

Mr. Muhammad Amin (RSG-306, Spring 2016)

Evaluation: The graph shows evaluation of the instructor. 100% of the students strongly agreed that “the instructor maintains an environment that is conducive for learning”, “The instructor is fair in examination” and “The subject matter presented in the course has increased your knowledge of the subject”, "course integrates theoretical course concepts with real world applications" and “the instructor was available during the specified office hours”. Whereas 94% students agreed that “the instructor shows respect towards the students and encourages class participation”," instructor is prepared for each class", “the instructor communicates the subject matter effectively”, “the course material was modern and updated”, and “the instructor provides additional material apart from textbook “.



Where:

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

Strengths:

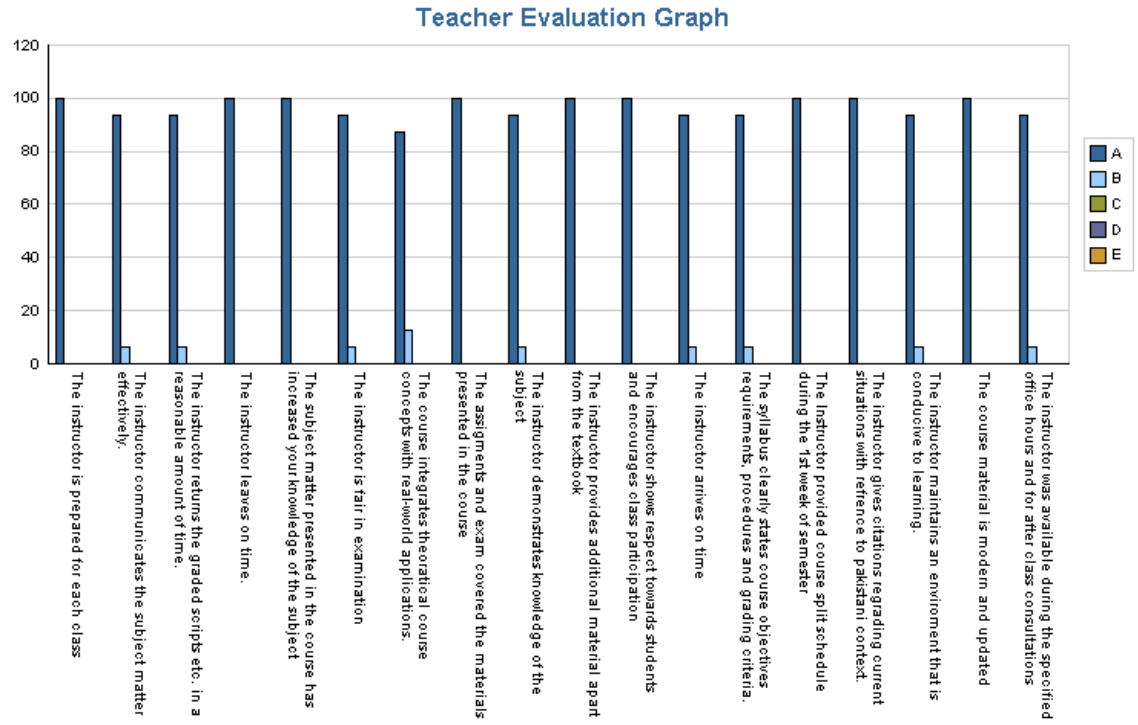
- The instructor maintains an environment that is conducive to learning.
- The course material was modern and updated
- The instructor demonstrates knowledge of the subject
- The subject matter presented in the course has increased the knowledge of the subject

Weakness:

- No significance weakness was found

Mr. Naeem Abbas Malik (RSG-304, Spring 2016)

Evaluation: The graph shows evaluation of the instructor. 100% percent of the students strongly agreed that “The instructor provides additional material apart from textbook", “The instructor shows respect towards students and encourages class participation”, and “The instructor gives citations regrading current situations with reference to Pakistani context”. 94% of the students strongly agreed that "the instructor is fair in examination", "communicated the subject matters effectively", maintains an environment that is conducive to learning".



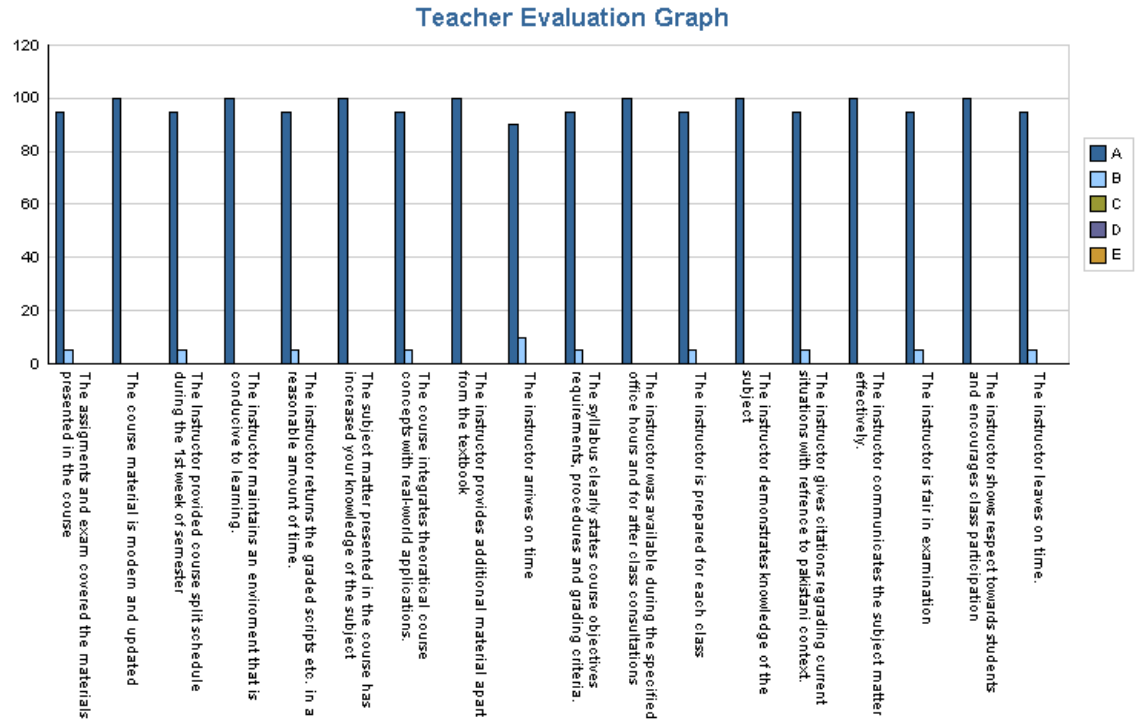
Where: A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree
Strengths:

- The course material was modern and updated
- The instructor communicates subject matter effectively
- The instructor demonstrates knowledge of the subject

Weakness: No significance weakness was found

Mr. Naeem Abbas Malik (RSG-405, Fall 2016)

Evaluation: The graph shows evaluation of the instructor. 100% percent of the students strongly agreed that “the instructor communicates the subject matter effectively”, “the course material was modern and updated”, and “the instructor provides additional material apart from textbook “," shows respect towards students", "available during the specified office hours". 95% of the students agreed that “the instructor is prepared for each class "," fair in examination", "returns he graded script in a reasonable amount of time".



Where:

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

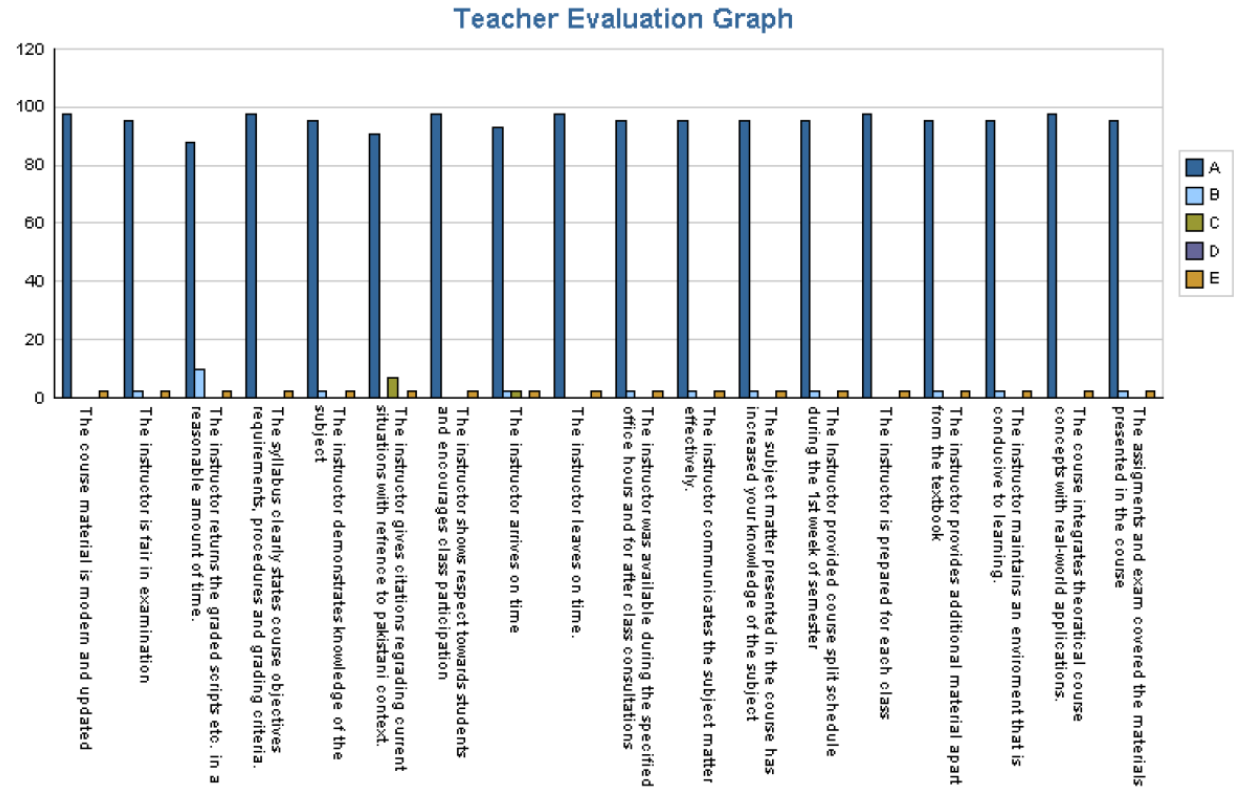
Strengths:

- The course material was modern and updated
- The instructor communicates subject matter effectively and demonstrates subject’s knowledge
- The course integrates theoretical course concepts with real-world applications.

Weakness: No significance weakness was found

Mr. Naeem Abbas Malik (RSG-303, Fall 2016)

Evaluation: The graph shows evaluation of the instructor. 98% percent of the students strongly agreed that “the courses integrates theoretical concepts with real world applications”, “the course material was modern and updated”, “the instructor is prepared for each class”, “The instructor leaves the class on time” and " shows respect towards students". 95% of the students agreed that “the instructor communicates the subject matter effectively”, " fair in examination", “the instructor provides additional material apart from textbook “ and "available during the specified office hours".



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

Strengths:

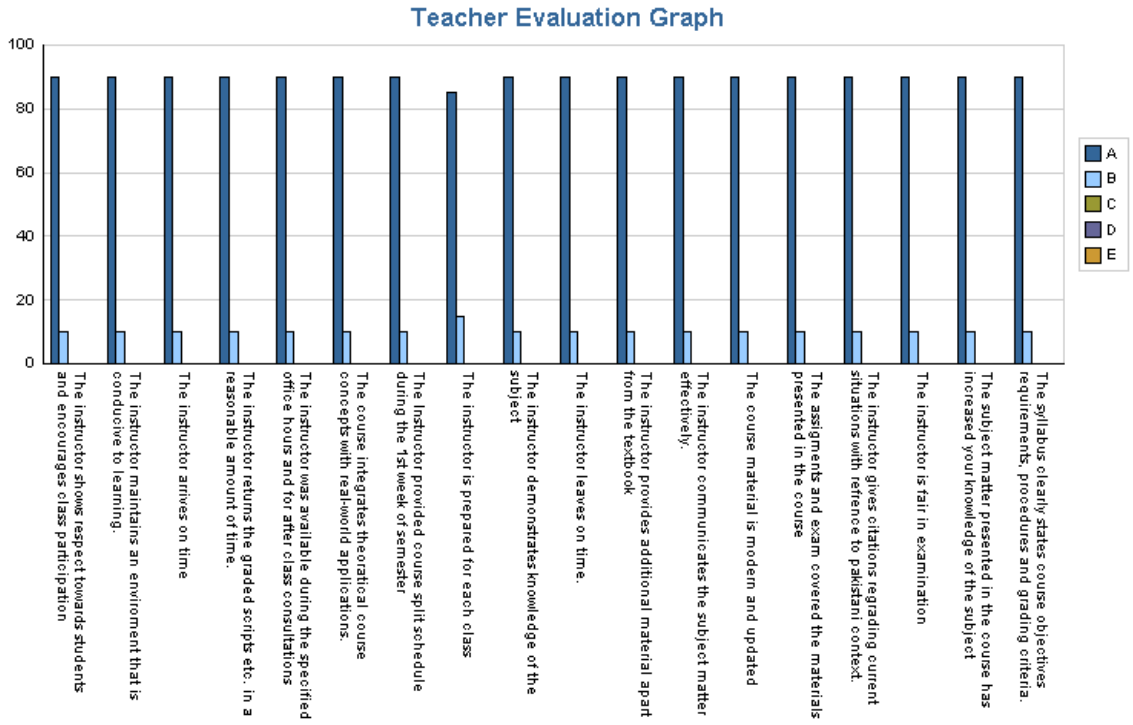
- The instructor leaves the class on time and shows respect towards students
- The course material was modern and updated

- The instructor communicates subject matter effectively and demonstrates subject's knowledge
- The course integrates theoretical course concepts with real-world applications.

Weakness: No significance weakness was found

Dr. Muhammad Hassan Ali Baig (RSG-401, Fall 2016)

Evaluation: The graph shows evaluation of the instructor. 90% percent of the students strongly agreed that "The instructor gives citations regarding current situations with reference to Pakistani context", "The instructor demonstrates knowledge of the subject", and "The instructor communicates the subject matter effectively"," fair in examination", "course material is modern and updated", "the instructor provides additional material apart from text book", "instructor was available during the specified office hours", and "shows respect towards the students".



Where:

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

Strengths:

- The instructor leaves the class on time and shows respect towards students
- The course material was modern and updated
- The instructor communicates subject matter effectively and demonstrates subject's knowledge
- The course integrates theoretical course concepts with real-world applications.

Weakness: No significance weakness was found.

Ms. Mubashra Sultan (RSG-404, Spring 2017)

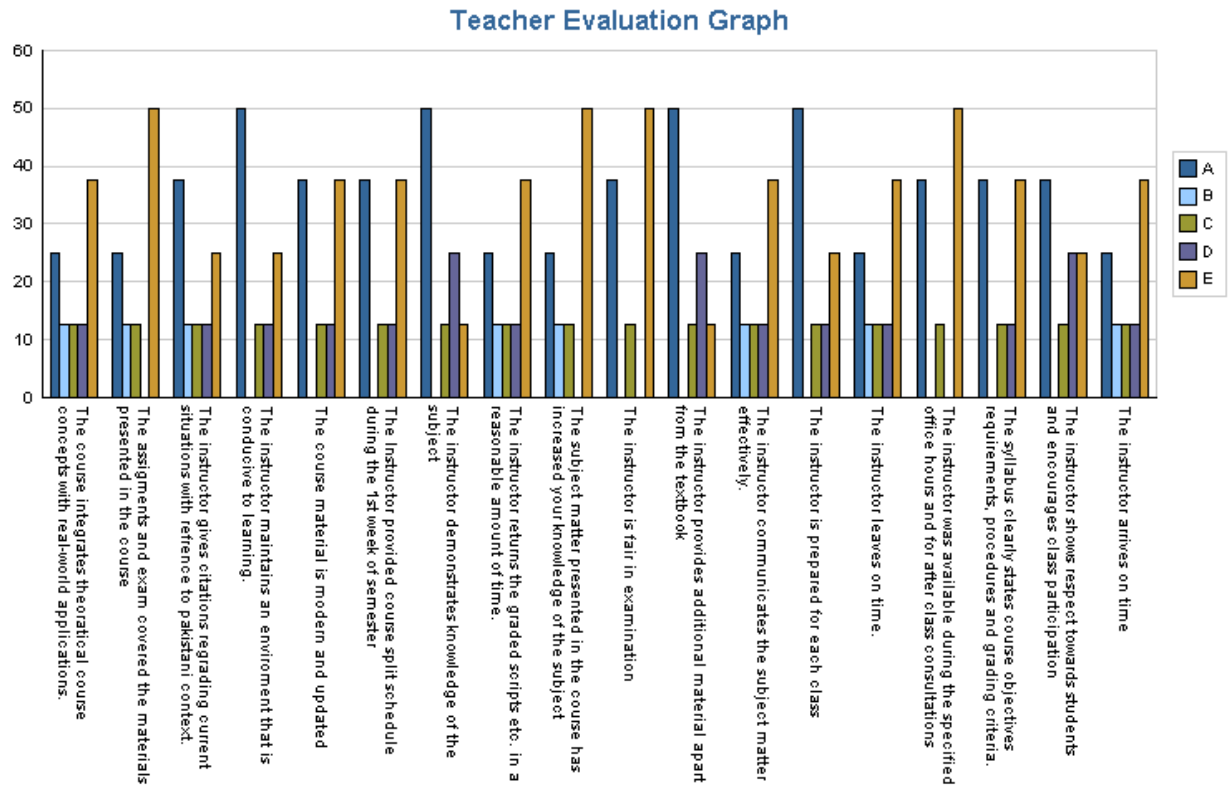
Evaluation: The graph shows evaluation of the instructor. 50% percent of the students strongly agreed that "The instructor demonstrates the knowledge of the subject", "maintains an environment that is conducive to the learning", "provide additional material apart from textbook" and instructor is prepared for each class. 38% of the students strongly agreed that "the instructor communicates the subject matter effectively", "return the graded script in a reasonable amount of time"," course material is modern and updated", "the instructor arrives on time" and "the instructor is fair in examination".

Strengths:

- The instructor maintains an environment that is conducive to the learning.
- The instructor is prepared for each class.
- The instructor communicates subject matter effectively and demonstrates subject's knowledge

Weakness:

- The assignments and exam does not cover the materials presented in the course.
- The instructor was not available during office hours.

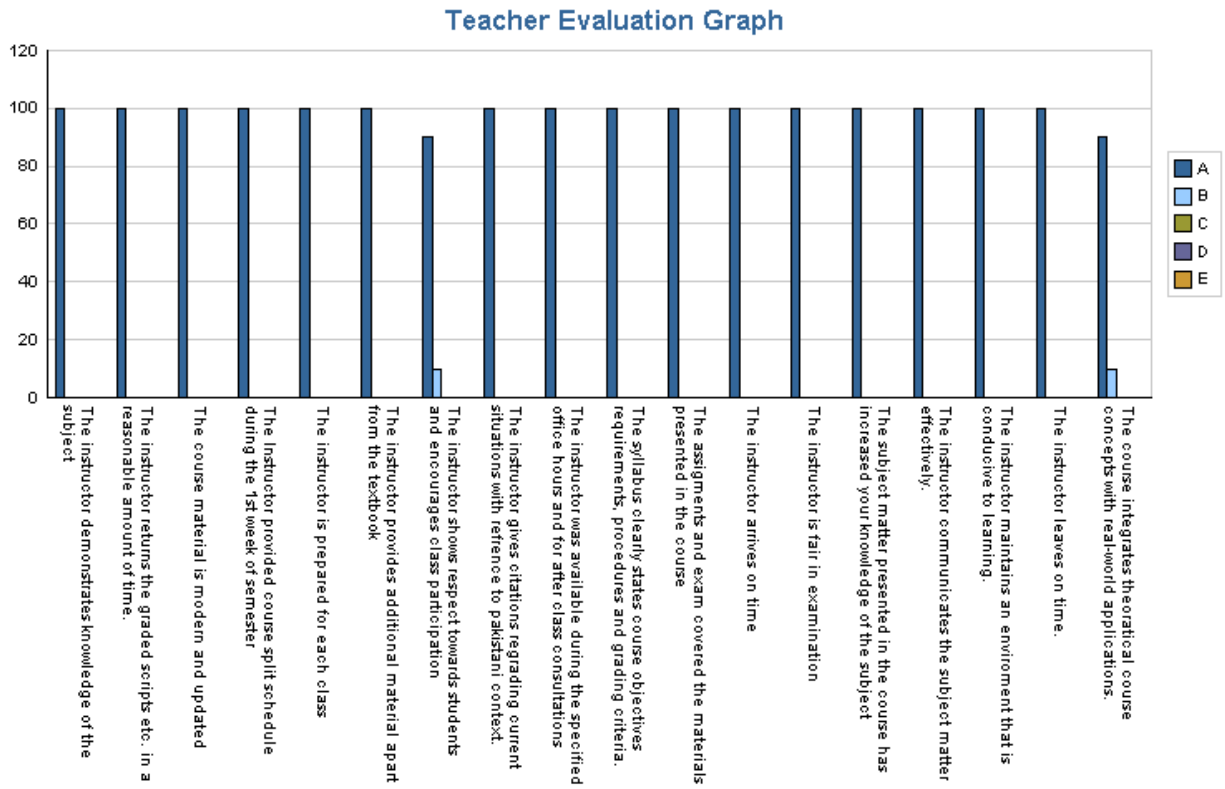


Where:

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

Mr. Muhammad Amin (RSG-408, Spring 2017)

Evaluation: The graph shows evaluation of the instructor. 100% percent of the students strongly agreed that "The instructor is prepared for each class", "The instructor provides additional material apart from the textbook", "The instructor gives citations regarding current situations with reference to Pakistani context ", "The course integrates theoretical course concepts with real-world applications", "The subject matter presented in the course has increased your knowledge of the subject", "The syllabus clearly states course objectives requirements, procedures and grading criteria", "provided course split schedule during the 1st week of semester" and "The instructor leaves on time".



Where:

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

Strengths:

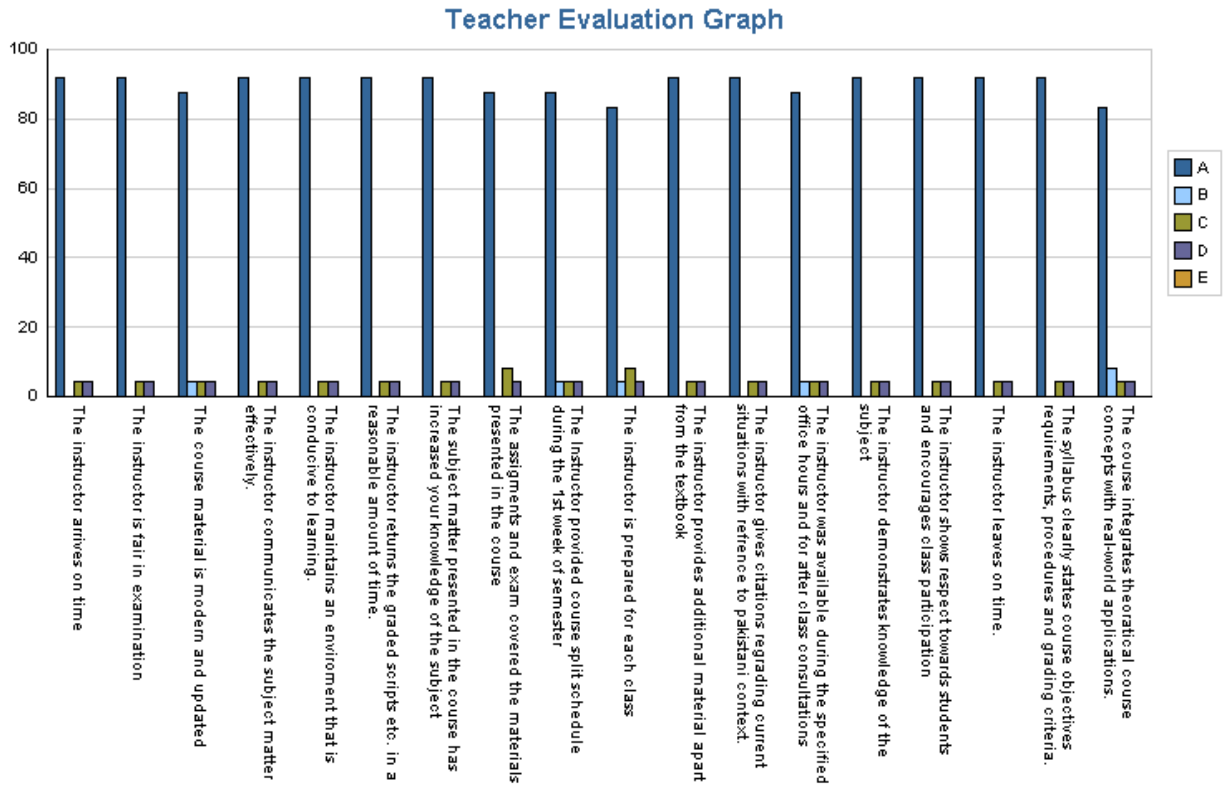
- The instructor maintains an environment that is conducive to the learning.
- The instructor is prepared for each class.
- The instructor communicates subject matter effectively and demonstrates subject's knowledge
- The assignments and exam covered the materials presented in the course.
- The instructor was fair in examination.

Weakness:

- No weakness was found.

Mr. Muhammad Amin (RSG-302, Spring 2017)

Evaluation: The graph shows evaluation of the instructor. 94% percent of the students strongly agreed that “the instructor communicates the subject matter effectively”, “the course material was modern and updated”, and “the instructor provides additional material apart from textbook “the instructor maintains an environment that is conducive for learning”, and “The subject matter presented in the course has increased your knowledge of the subject”. 88% students strongly agreed that “The instructor is fair in examination”, "course integrates theoretical course concepts with real world applications" and “the instructor was available during the specified office hours”.



Where:

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

Strengths:

- The instructor maintains an environment that is conducive to the learning.
- The instructor is prepared for each class.
- The instructor communicates subject matter effectively and demonstrates subject's knowledge
- The assignments and exam covered the materials presented in the course.
- The instructor was fair in examination.

Weakness:

- No significant weakness was found.

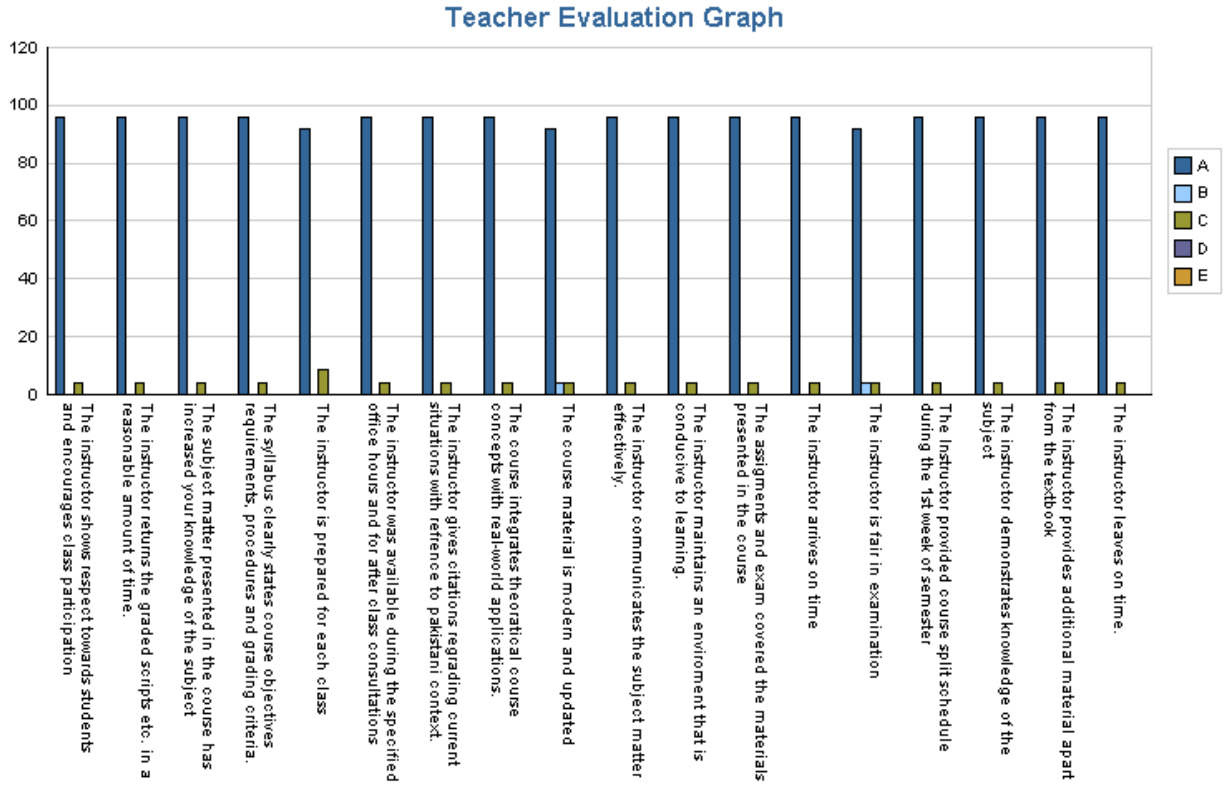
Mr. Naeem Abbas Malik (RSG-304, Spring 2017)

Evaluation: The graph shows evaluation of the instructor. 96% percent of the students strongly agreed that "the instructor communicates the subject matter effectively", " the instructor shows respect towards the students", "available during the specified office hours ","the instructor provides additional material apart from textbook", "the instructor maintains an environment that is conducive for learning", and "subject matter presented in the course has increased your knowledge". 92% students strongly agreed that "The instructor is fair in examination", "the course material was modern and updated" and "the instructor is prepared for each class".

Strengths:

- The instructor maintains an environment that is conducive to the learning.
- The instructor is prepared for each class.
- The instructor communicates subject matter effectively and demonstrates subject's knowledge
- The assignments and exam covered the materials presented in the course.
- The instructor was fair in examination.

Weakness: No weakness was found.

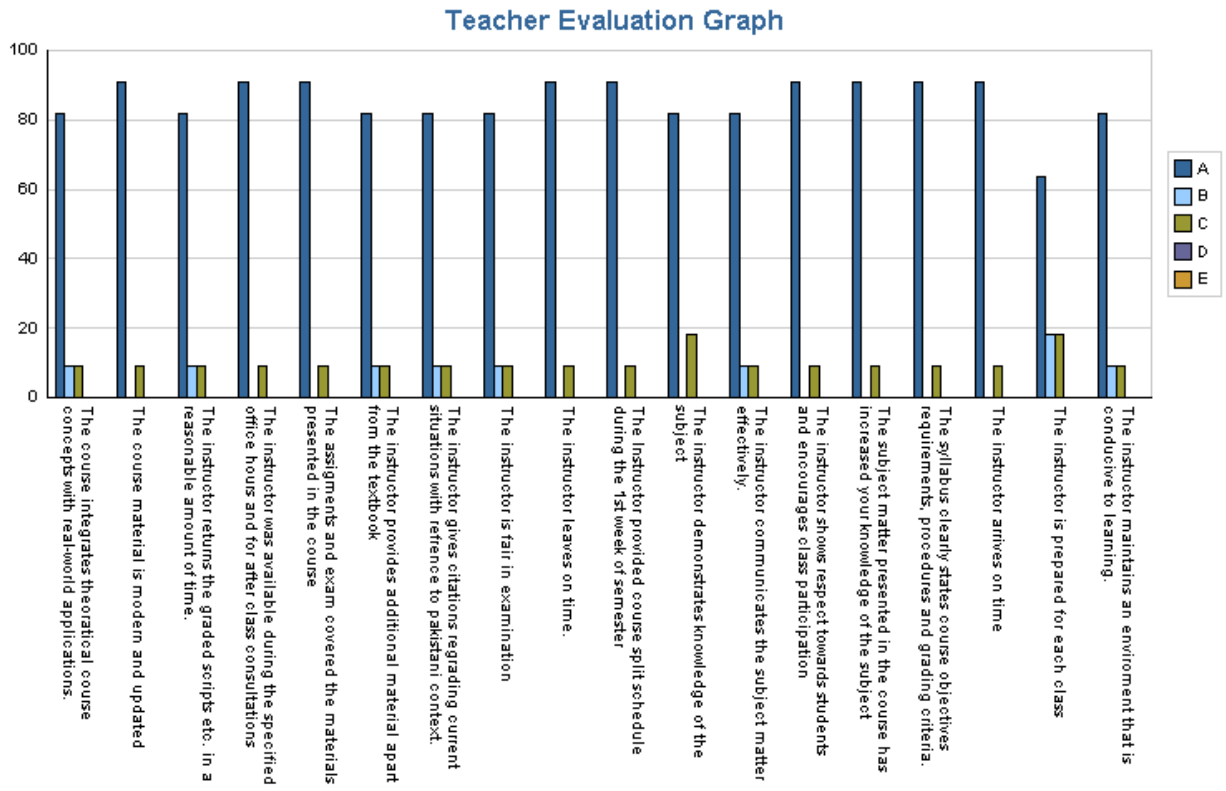


Where:

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

Mr. Naeem Abbas Malik (RSG-402, Spring 2017)

Evaluation: The graph shows evaluation of the instructor. 91% percent of the students strongly agreed that “The instructor arrives on time”, “The syllabus clearly states course objectives requirements, procedures and grading criteria”, “the course material is modern and updated" the instructor shows respect towards the students", "available during the specified office hours", "subject matter presented in the course has increased your knowledge". 82% percent of the students strongly agreed that “The instructor demonstrates knowledge of the subject”, “the instructor communicates the subject matter effectively”, and “The instructor maintains an environment that is conducive to learning”.



Where:

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

Strengths:

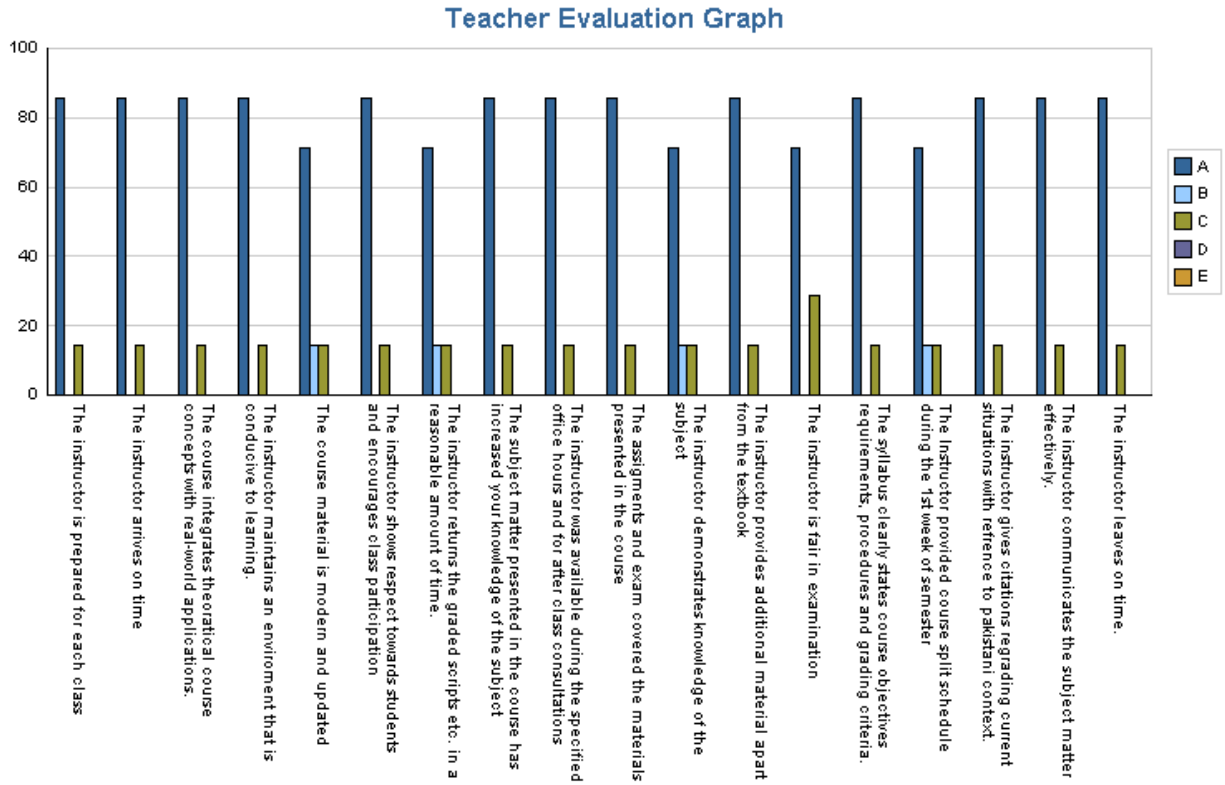
- The instructor maintains an environment that is conducive to the learning.
- The instructor is prepared for each class.
- The instructor communicates subject matter effectively and demonstrates subject's knowledge
- The assignments and exam covered the materials presented in the course.
- The instructor was fair in examination.

Weakness:

No weakness was found.

Mr. Shahid Amir (RSG-406, Spring 2017)

Evaluation: The graph shows evaluation of the instructor. 86% of the students strongly agreed that "the instructor communicates the subject matter effectively"," gives citations regarding current situations with reference to Pakistani context", "prepared for each class", "clearly states course objectives requirements, procedures and grading criteria", “leaves on time”, and “The instructor maintains an environment that is conducive to learning”. 71% students strongly agreed that “the instructor provides course split schedule”, “the course material is modern and updated” and “The instructor demonstrates knowledge of the subject”.



Where:

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

Strengths:

- The instructor maintains an environment that is conducive to the learning.
- The instructor is prepared for each class.
- The instructor communicates subject matter effectively and demonstrates subject's knowledge
- The assignments and exam covered the materials presented in the course.
- The instructor was fair in examination.

Weakness:

- The instructor was not available during office hours.

Mr. Ahsan Jamil (RSG-306, Spring 2017)

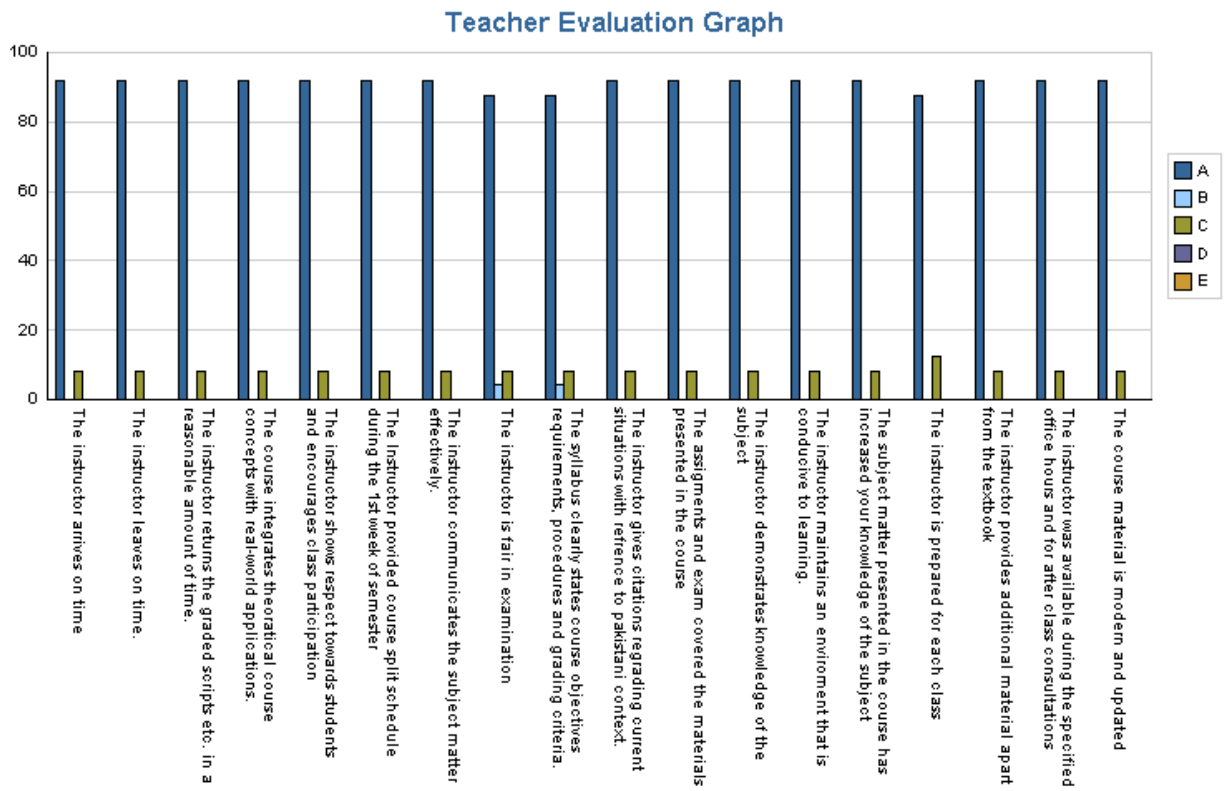
Evaluation: The graph shows evaluation of the instructor. 92% percent of the students strongly agreed that "the instructor communicates the subject matter effectively", "the course material was modern and updated", "The instructor maintains an environment that is conducive for learning", "The instructor is fair in examination" and "The subject matter presented in the course has increased your knowledge of the subject", "The instructor was prepared for each class", "course integrates theoretical course concepts with real world applications" and "the instructor was available during the specified office hours".

Strengths:

- The instructor maintains an environment that is conducive to the learning.
- The instructor is prepared for each class and he was fair in examination.
- The instructor communicates subject matter effectively and demonstrates subject's knowledge
- The assignments and exam covered the materials presented in the course.

Weakness:

- The instructor was not available during office hours.



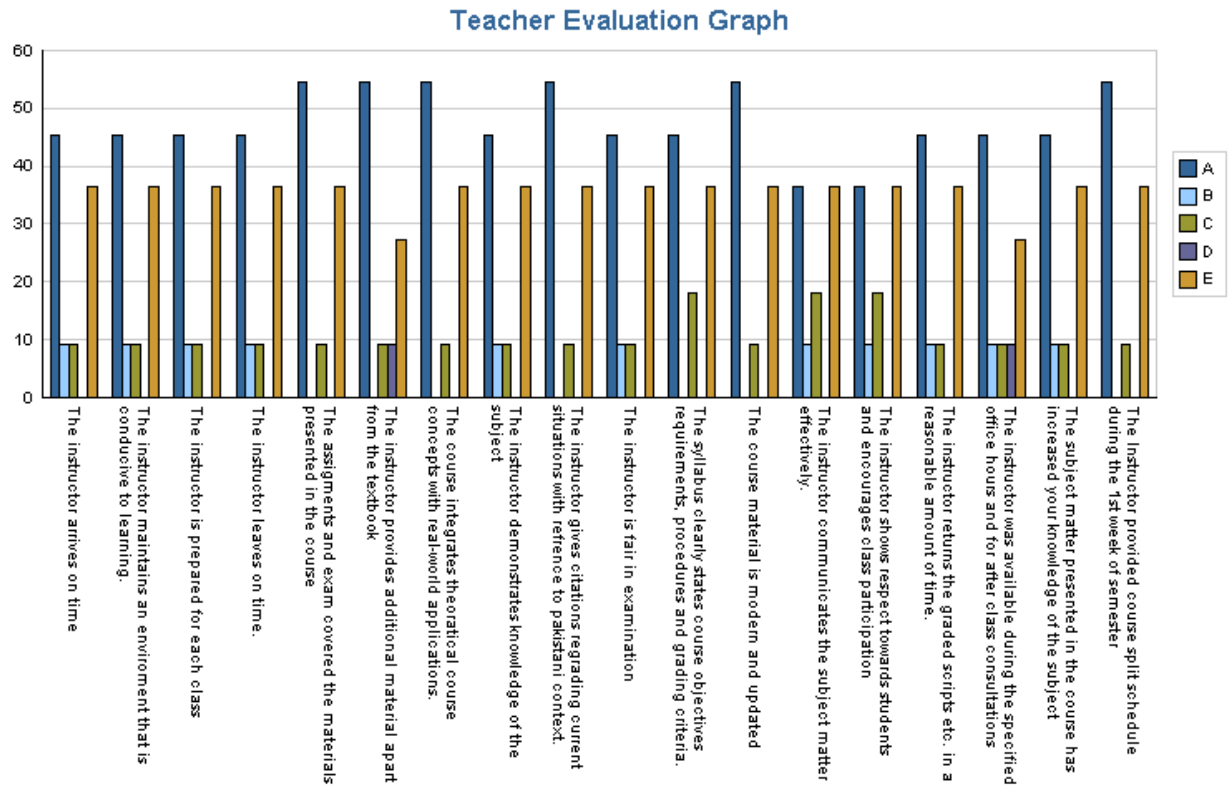
Where:

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

Mr. Younas khan (CS-410, Spring 2017)

Evaluation: The graph shows evaluation of the instructor. 55% of the students strongly agreed that "The Instructor provided course split schedule", "The assignments and exam covered the materials presented in the course", "The course integrates theoretical course concepts with real-world applications" and "The course material is modern and updated. 45% of the students strongly agreed that "the instructor is fair in examination", "maintain an environment that is conducive to learning"," prepared for each class", "returns the graded scripts in a reasonable amount of time". 36% of the students strongly disagreed that " the instructor is fair in examination", "communicate

the subject matter effectively", "shows respect towards the students and encourage class participation".



Where:

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

Strengths:

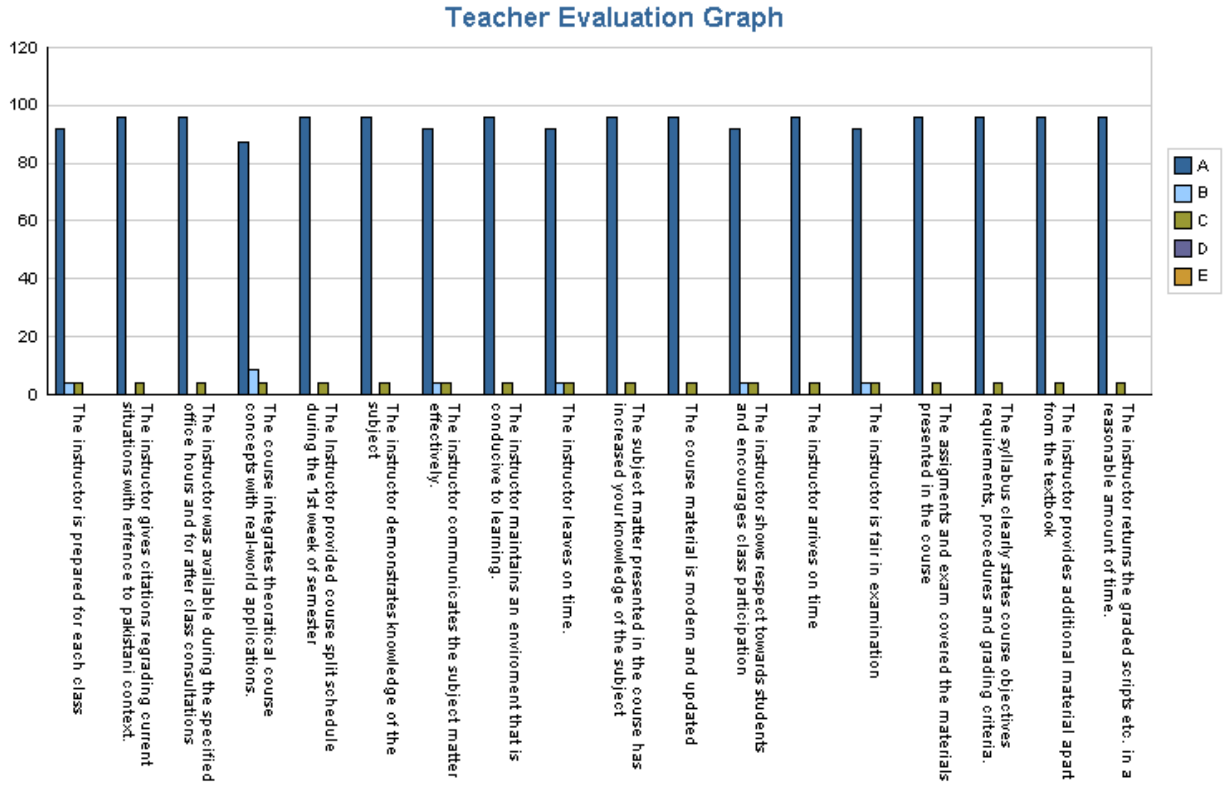
- The instructor is prepared for each class and he was fair in examination.
- The instructor communicates subject matter effectively and demonstrates subject's knowledge
- The assignments and exam covered the materials presented in the course.

Weakness:

- The instructor was not available during office hours.
- The instructor didn't encourage class participation.

Mr. Younas Khan (CS-312, Spring 2017)

Evaluation: The graph shows evaluation of the instructor. 96% of the students strongly agreed that "the instructor was available during the specified office hours", "the instructor provides additional material apart from textbook", "the instructor maintains an environment that is conducive for learning", "The subject matter presented in the course has increased your knowledge of the subject", "the instructor shows respect towards students which encourage participation" and "the course material was modern and updated". 92% students strongly agreed that "the instructor is prepared for each class", "The instructor is fair in examination", and "the instructor communicates the subject matter effectively".



Where:

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

Strengths:

- The instructor maintains an environment that is conducive to the learning.
- The instructor is prepared for each class and he was fair in examination.
- The instructor communicates subject matter effectively and demonstrates subject's knowledge
- The assignments and exam covered the materials presented in the course.

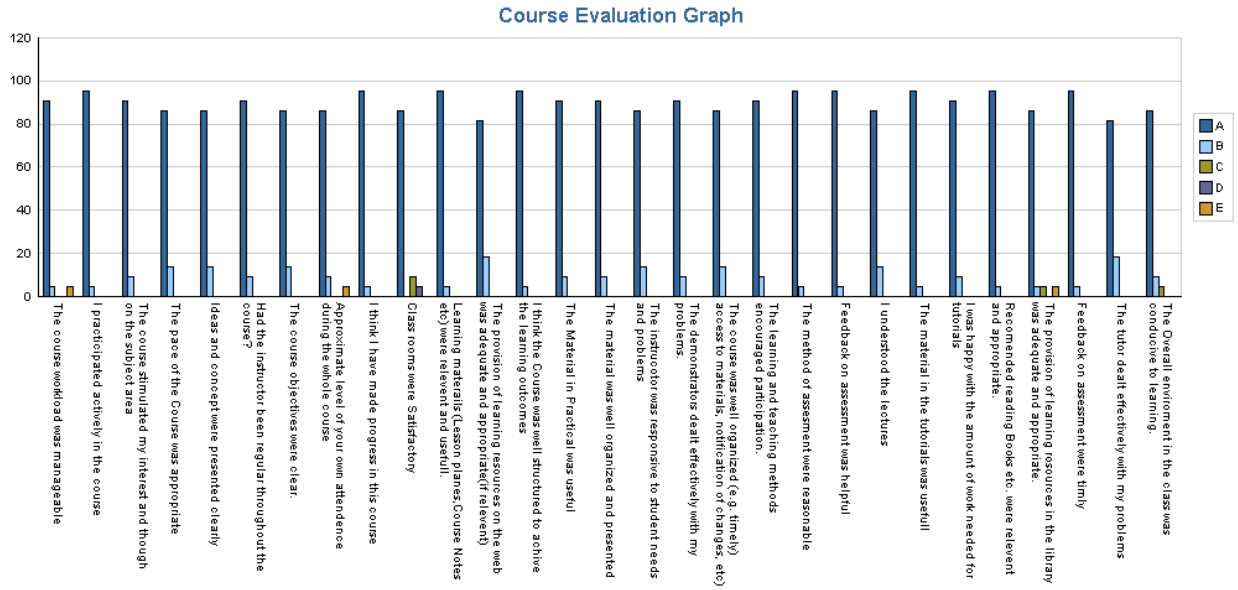
Weakness:

- No significant weakness was found.

Course Evaluation:

Prof. Dr. Mobushir Riaz Khan (RSG-301, Fall 2015)

Evaluation: The graph shows evaluation of the course. 95% of students agreed that "Feedback on assessment was helpful", "Feedback on assessment were timely", "I participated actively in the course", "I think I have made progress in this course", "I think the Course was well structured to achieve the learning outcomes", "Learning materials (Lesson planes, Course Notes etc.) were relevant and useful" and "The material in the tutorials was useful". 91 percent of the students strongly agreed that "The pace of the Course was appropriate", "the participation of concerns was effectively stimulated", "The course workload was manageable", "The demonstrators dealt effectively with my problems", "I was happy with the amount of work needed for tutorials", and "The instructor was responsive to student needs and problems".



Where:

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

General Comments by Students about this course:

Strengths:

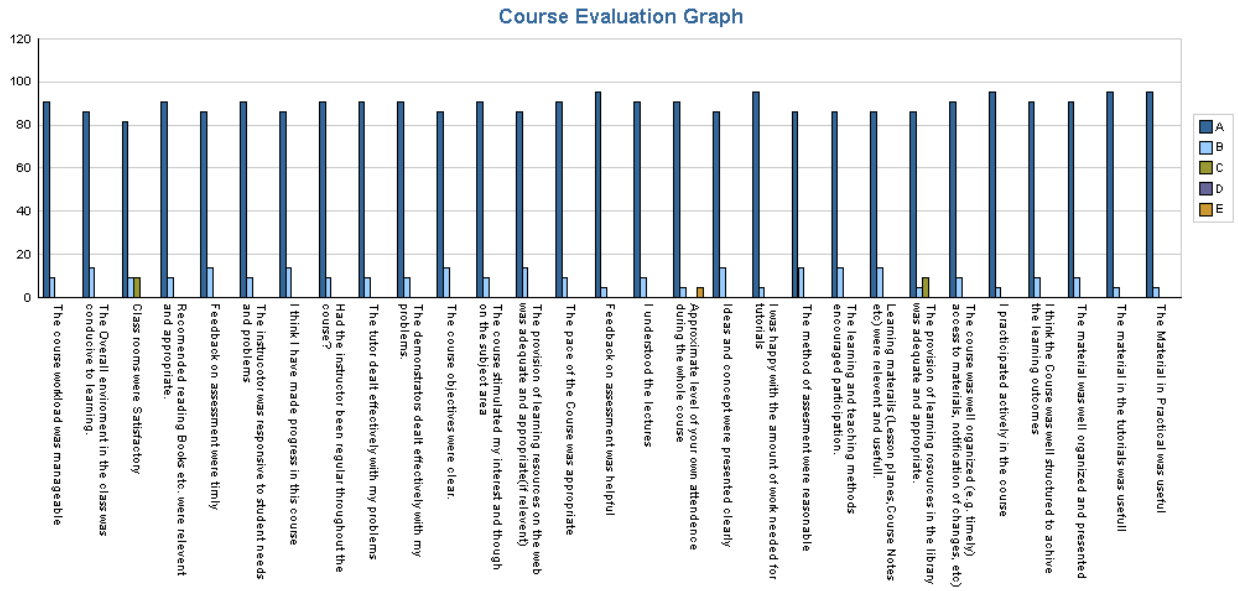
- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses:

- No significant weakness was found

Mr. Muhammad Amin (RSG-303, Fall 2015)

Evaluation: The graph shows evaluation of the course. 95% of students agreed that “Feedback on assessment was helpful”, “I was happy with the amount of work needed for tutorials”, and “The material in the tutorials was useful”. 91 percent of the students strongly agreed that “the ideas and concepts presented clearly”, “The pace of the Course was appropriate”, “the participation of coerces was effectively and coerce was stimulated”, “The course workload was manageable”, “The demonstrators dealt effectively with my problems”, “The instructor was responsive to student needs and problems” and “Recommended reading Books etc. were relevant and appropriate".



Where:

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

General Comments by Students about this course:

Strengths:

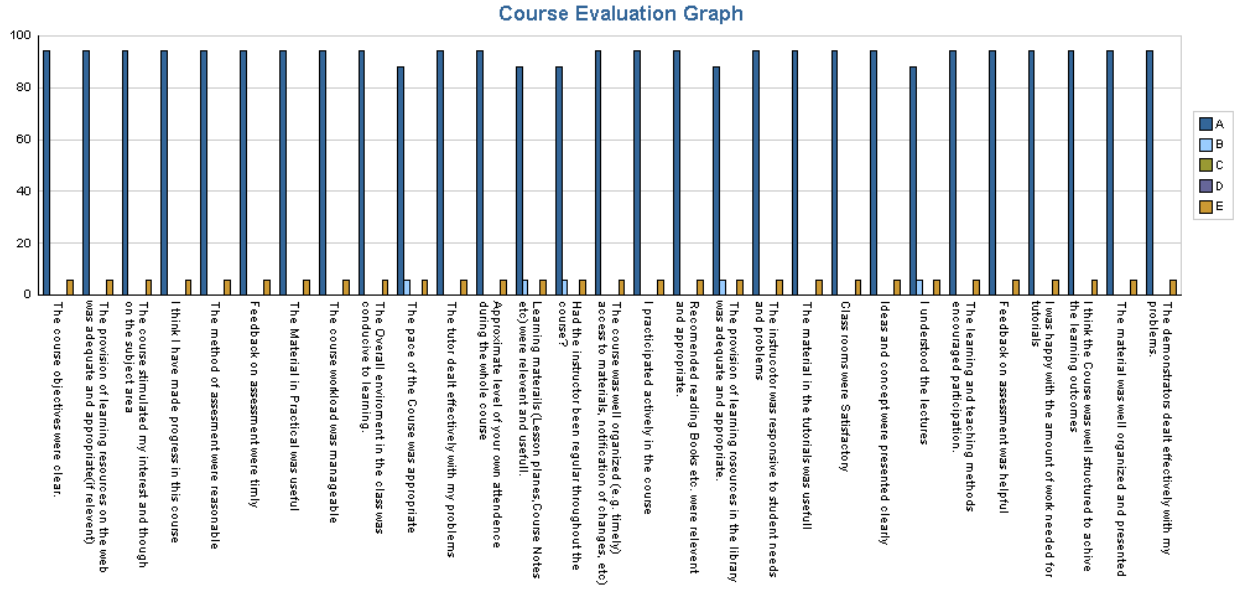
- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses:

- No significant weakness was found

Mr. Muhammad Amin (RSG-302, Spring 2016)

Evaluation: The graph shows evaluation of the course. 94 percent of the students strongly agreed that "The Feedback on assessment were timely", "I participated actively in the course", "I think the Course was well structured to achieve the learning outcomes", "I think I have made progress in this course", "I was happy with the amount of work needed for tutorials", "The course objectives were clear", "The course stimulated my interest and though on the subject area", "The course was well organized (e.g. timely) access to materials, notification of changes, etc.)", "The Material in Practical was useful", "The Overall environment in the class was conducive to learning", The learning and teaching methods encouraged participation" and "The material was well organized and presented".



Where:

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

General Comments by Students about this course:

Strengths:

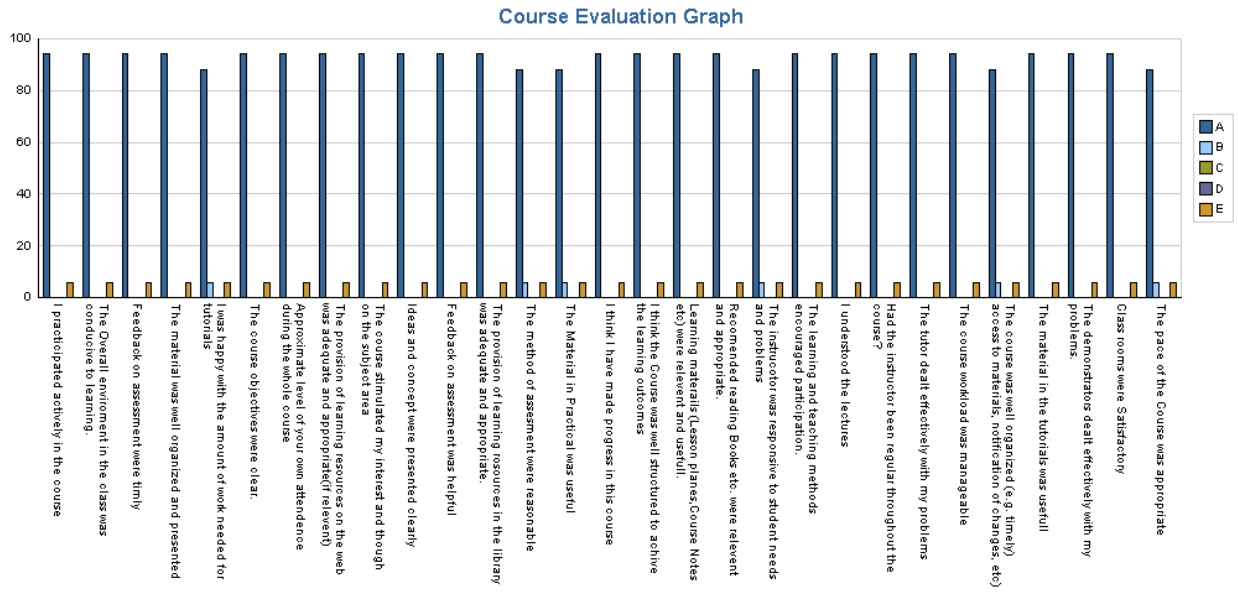
- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses:

- No significant weakness was found

Mr. Naeem Abbas Malik (RSG-304, Spring 2016)

Evaluation: The graph shows evaluation of the course. 94 percent of the students strongly agreed that “Approximate level of your own attendance during the whole course”, “Class rooms were Satisfactory”, “Feedback on assessment was helpful”, “Feedback on assessment were timely”, “Had the instructor been regular throughout the course?”, “I participated actively in the course”, “I think I have made progress in this course”, “I think the Course was well structured to achieve the learning outcomes”, “I understood the lectures”, "the Learning materials (Lesson planes, Course Notes etc) were relevant and useful”, “The course objectives were clear”, “The course stimulated my interest and though on the subject area”, and “The course workload was manageable".



Where:

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

General Comments by Students about this course:

Strengths:

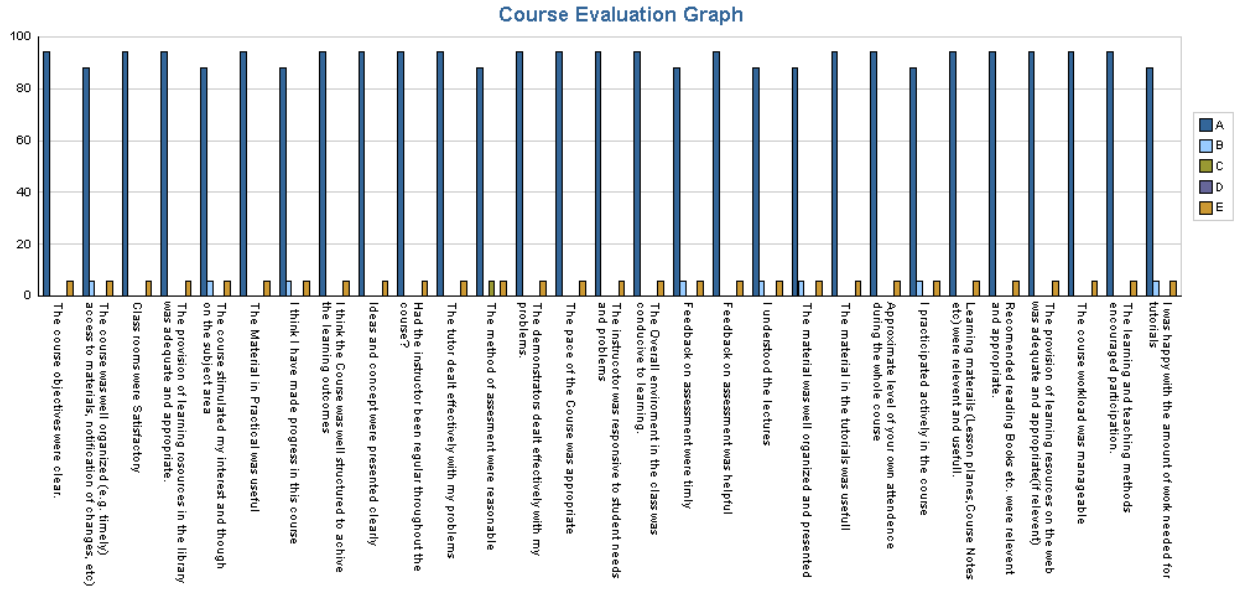
- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses:

- No significant weakness was found

Mr. Muhammad Amin (RSG-306, Spring 2016)

Evaluation: The graph shows evaluation of the course. 94 percent of the students strongly agreed that “I think the Course was well structured to achieve the learning outcomes", “Approximate level of your own attendance during the whole course”, “Class rooms were Satisfactory”, “Feedback on assessment was helpful”, “The course objectives were clear”, “The Material in Practical was useful”, “The Overall environment in the class was conducive to learning” and “The learning and teaching methods encouraged participation”. 88 percent of the students strongly agreed that “The Feedback on assessment were timely", "I participated actively in the course”, “I think I have made progress in this course”, “I was happy with the amount of work needed for tutorials", “The course stimulated my interest and though on the subject area”, “The course was well organized (e.g. timely) access to materials, notification of changes, etc.)” and “The material was well organized and presented”.



Where:

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

General Comments by Students about this course:

Strengths:

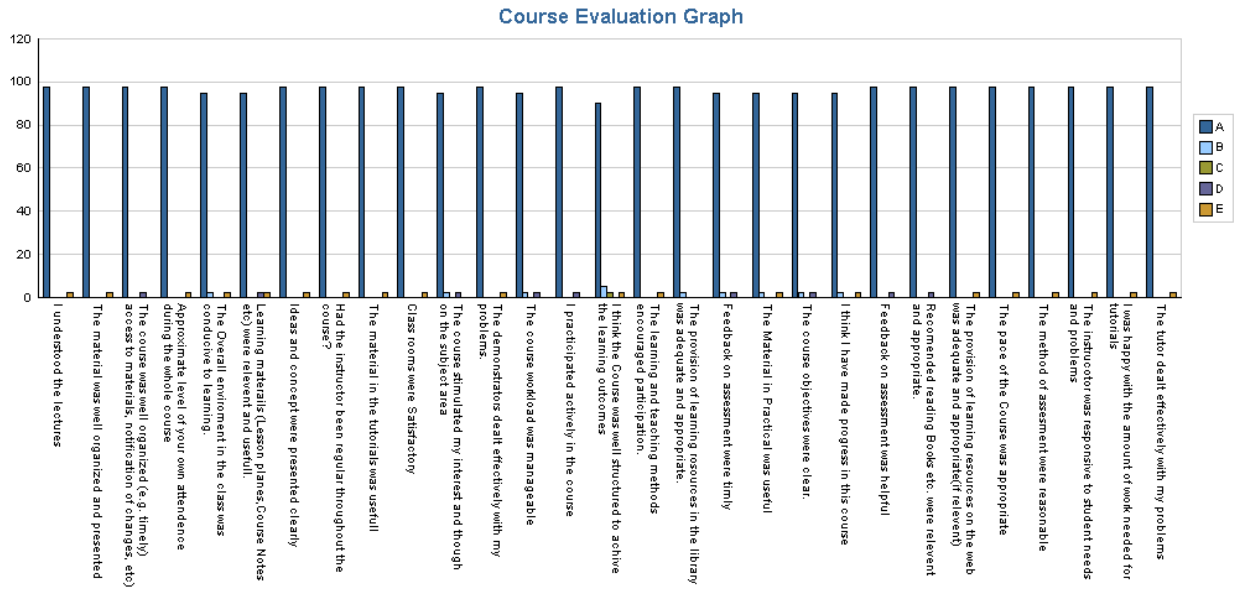
- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses:

- No significant weakness was found

Mr. Muhammad Amin (RSG-301, Fall 2016)

Evaluation: The graph shows evaluation of the course. 98 percent of the students strongly agreed that “the Feedback on assessment was helpful", "Ideas and concept were presented clearly", "The instructor was responsive to student needs and problems", "the Ideas and concept were presented clearly", "Recommended reading Books etc. were relevant and appropriate”, “The demonstrators dealt effectively with my problems”, “The learning and teaching methods encouraged participation”, “The material in the tutorials was useful”, “The material was well organized and presented”, “The method of assessment were reasonable” and “The pace of the Course was appropriate”. 95 percent of the students strongly agreed that "Feedback on assessment were timely", “The course objectives were clear”, “The course stimulated my interest and thought on the subject area” and “I think I have made progress in this course”.



Where:

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

General Comments by Students about this course:

Strengths:

- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

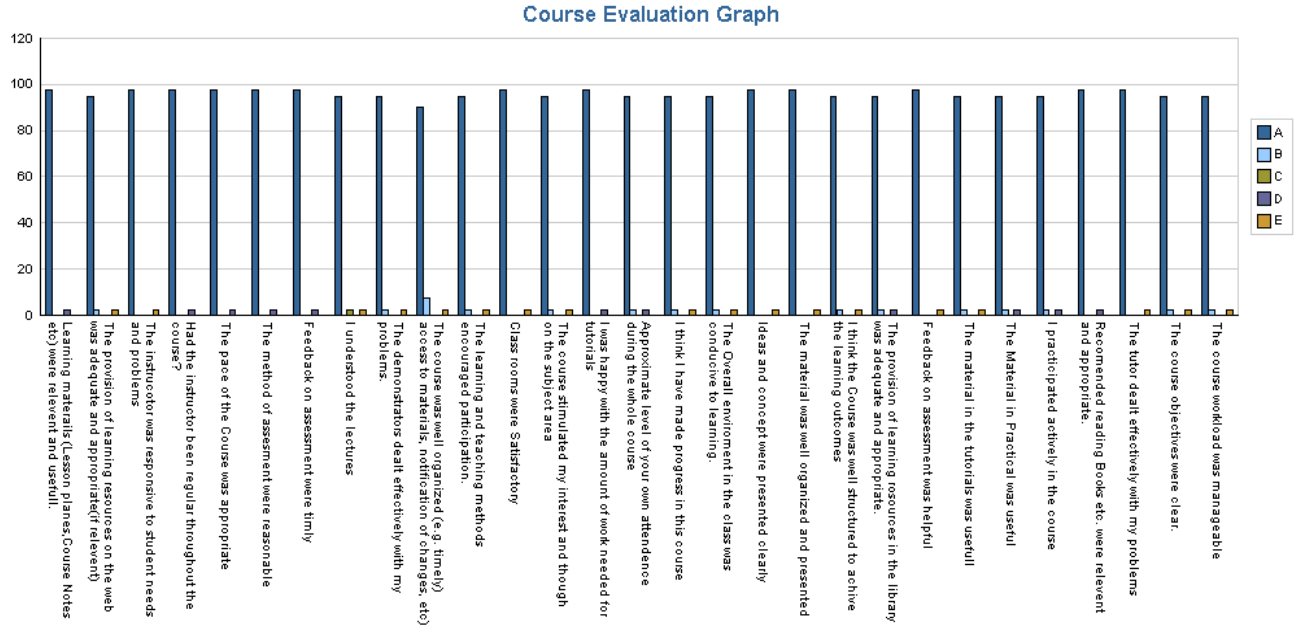
Weaknesses:

- No significant weakness was found

Mr. Naeem Abbas Malik (RSG-303, FALL 2016)

Evaluation: The graph shows evaluation of the course. 98% of the students strongly agreed that "Feedback on assessment was helpful", “Feedback on assessment were timely", “Had the instructor been regular throughout the course?", “I was happy with the amount of work needed for tutorials”, “Ideas and concept were presented clearly”, “The material was well organized and

presented", "The method of assessment were reasonable", "The provision of Learning materials were relevant and useful" and "Recommended reading Books etc. were relevant and appropriate". 95 percent of the students strongly agreed that "I think I have made progress in this course ","I participated actively in the course", "The Material in Practical was useful", "The Overall environment in the class was conducive to learning", "The course objectives were clear", "The course stimulated my interest and though on the subject area", "I understood the lectures" and "I think the Course was well structured to achieve the learning outcomes".



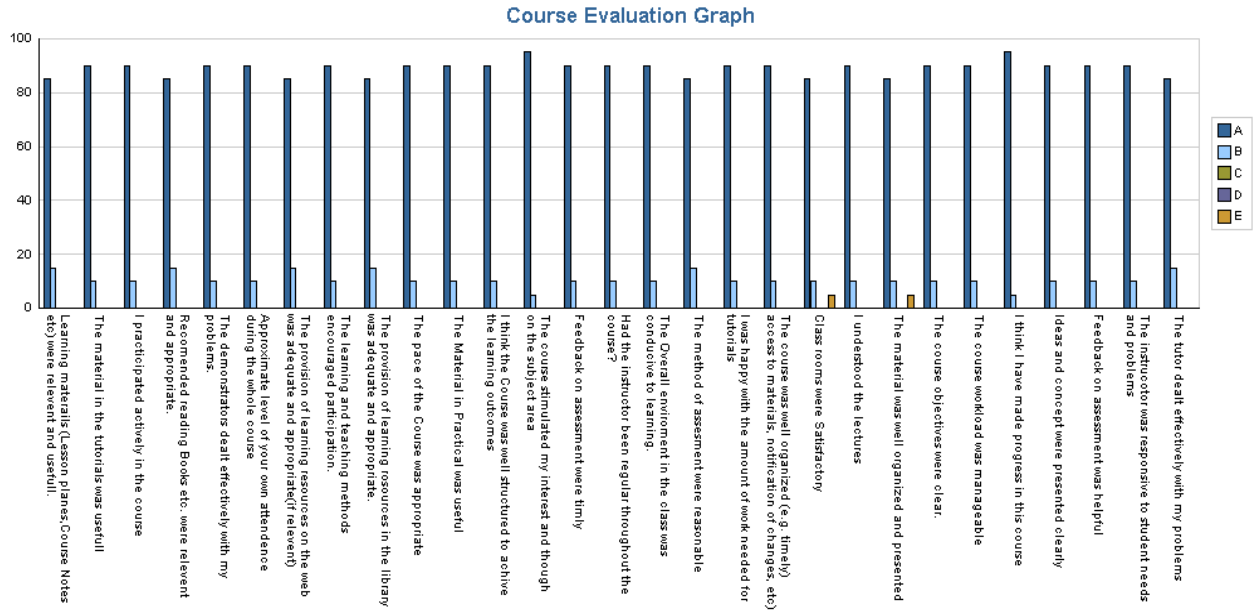
Where:A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree
Strengths:

- The Course objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses: No significant weakness was found

Dr. Muhammad Hassan Ali Baig (RSG-401, FALL2016)

Evaluation: The graph shows evaluation of the course. 90 percent of the students strongly agreed that "The course was well organized (e.g. timely) access to materials, notification of changes, etc.)", "The course objectives were clear", "I think the Course was well structured to achieve the learning outcomes", "I understood the lectures", "I was happy with the amount of work needed for tutorials", "Ideas and concept were presented clearly", "The course workload was manageable", "The learning and teaching methods encouraged participation", "Feedback on assessment was helpful", "Feedback on assessment were timely", "Had the instructor been regular throughout the course?", "I participated actively in the course", "The Material in Practical was useful", "The provision of learning resources in the library was adequate and appropriate" and "The pace of the Course was appropriate".



Where:

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

General Comments by Students about this course:

Strengths:

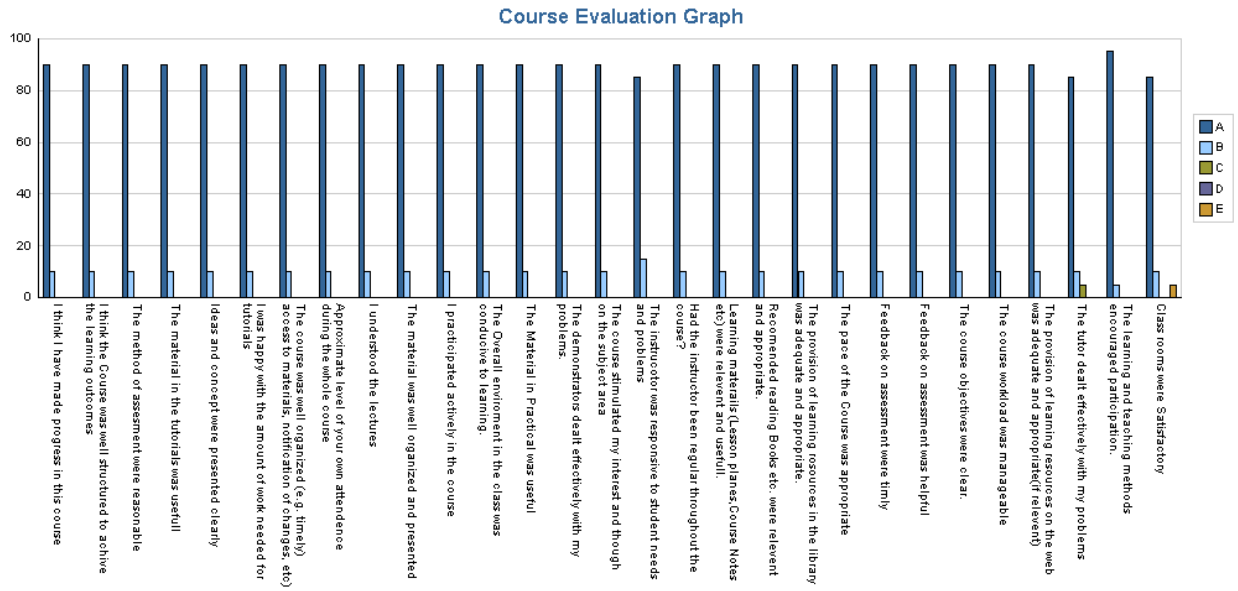
- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses:

- No significant weakness was found

Mr. Muhammad Amin (RSG-403, Fall 2016)

Evaluation: The graph shows evaluation of the course. 90 percent of the students strongly agreed that “The course stimulated my interest and though on the subject area”, “Ideas and concept were presented clearly”, “The course workload was manageable “, “Feedback on assessment was helpful", “I participated actively in the course”, “I think I have made progress in this course”, “I think the Course was well structured to achieve the learning outcomes”, “I understood the lectures”, “I was happy with the amount of work needed for tutorials”, “Ideas and concept were presented clearly”, “Learning materials (Lesson planes, Course Notes etc) were relevant and useful”, “Recommended reading Books etc. were relevant and appropriate”, “The Material in Practical was useful”, “The Overall environment in the class was conducive to learning”, “The course objectives were clear”, “The Material in Practical was useful”, “The instructor was responsive to student needs and problems” and “The learning and teaching methods encouraged participation”.



Where:

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

General Comments by Students about this course:

Strengths:

- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

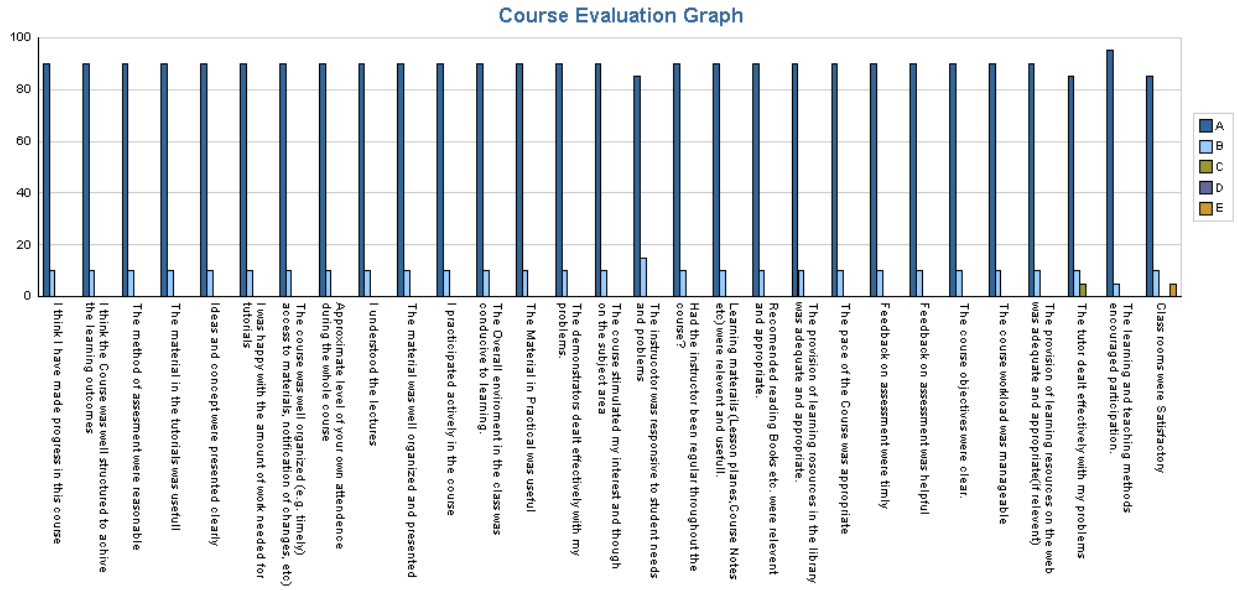
Weaknesses:

- No significant weakness was found

Mr. Naeem Abbas Malik (RSG-405, FALL 2016)

Evaluation: The graph shows evaluation of the course. 95 percent of the students strongly agreed that “The course workload was manageable”, “I participated actively in the course”, “I think the Course was well structured to achieve the learning outcomes”, “The course was well organized (e.g. timely access to materials, notification of changes, etc.)”, “The course workload was

manageable", "The course objectives were clear", and "Approximate level of your own attendance during the whole course ". 90% of the students strongly agreed that "Feedback on assessment were timely", "Ideas and concept were presented clearly", "The Material in Practical was useful", "The Overall environment in the class was conducive to learning", "I understood the lectures", "The Material in Practical was useful"" and "The learning and teaching methods encouraged participation".



Where:

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

Strengths:

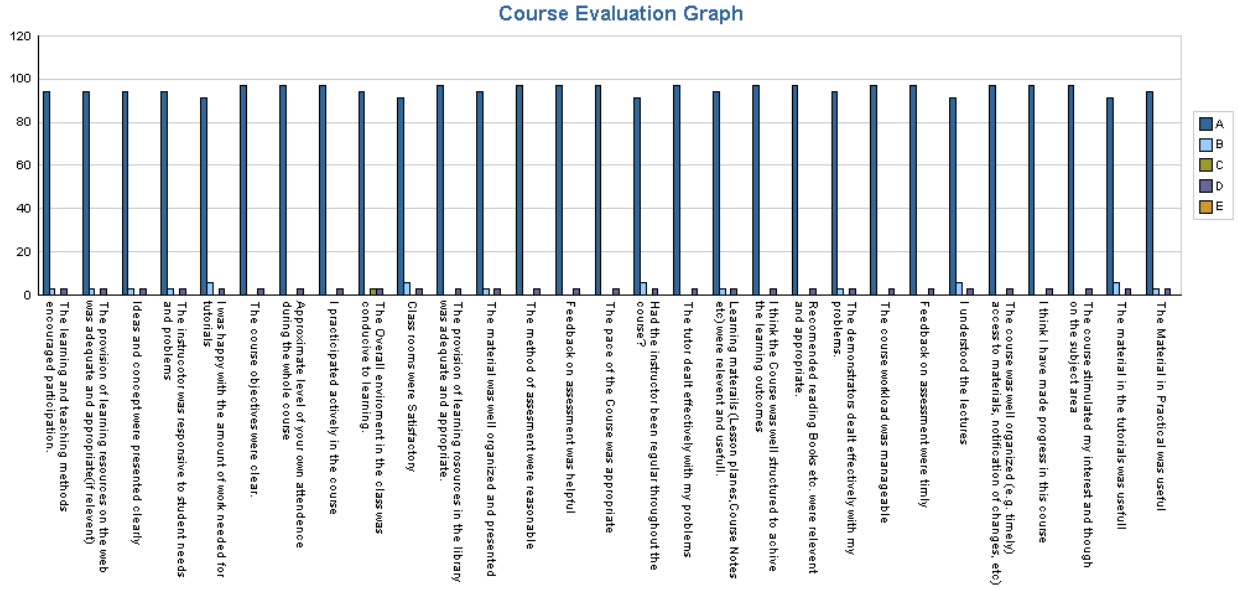
- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses:

- No significant weakness was found

Mr. Muhammad Amin (RSG-302, SPRING 2017)

Evaluation: The graph shows evaluation of the course. 97 percent of the students strongly agreed that “The Feedback on assessment were timely", "I participated actively in the course”, “I think the Course was well structured to achieve the learning outcomes"," I was happy with the amount of work needed for tutorials", “The course objectives were clear”, “The course stimulated my interest and though on the subject area”, “The course was well organized (e.g. timely) access to materials, notification of changes, etc)” and “The course workload was manageable”. 94 percent of the students strongly agreed that “The Material in Practical was useful”, “The Overall environment in the class was conducive to learning”, The learning and teaching methods encouraged participation” and “The material was well organized and presented”.



Where:

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

General Comments by Students about this course:

Strengths:

- The Course Objectives were clear

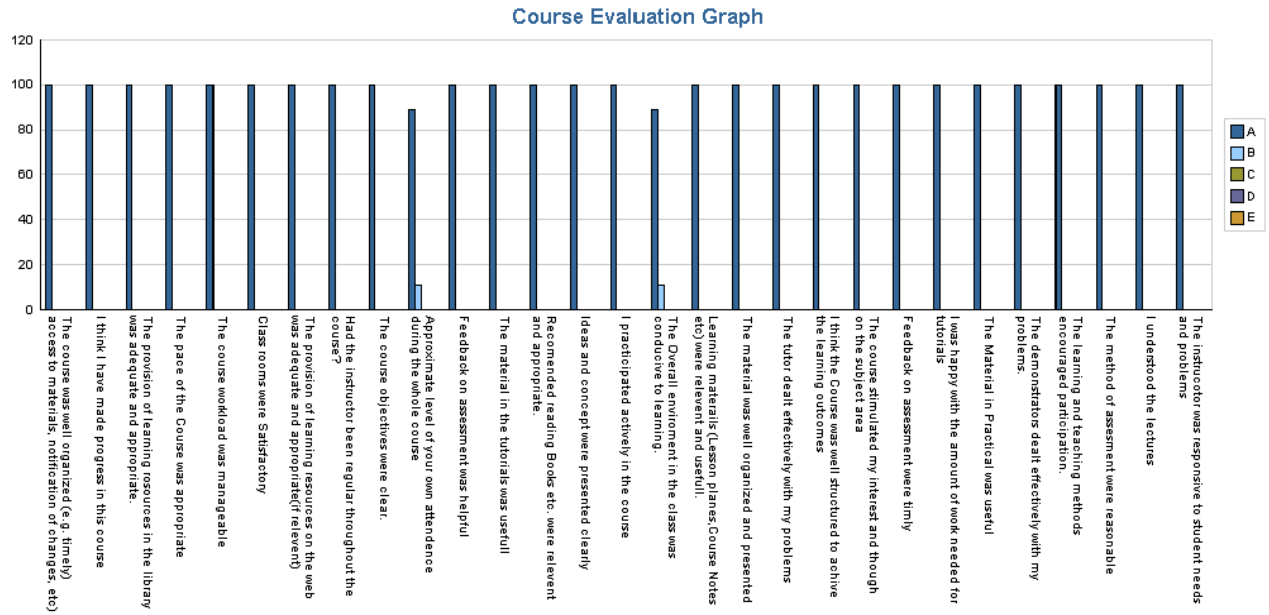
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses:

- No significant weakness was found

Mr. Naeem Abbas Malik (RSG-304, Spring 2017)

Evaluation: The graph shows evaluation of the course. 94% percent of the students strongly agreed that “the ideas and concepts presented clearly”, “Feedback on assessment were timely”, “Had the instructor been regular throughout the course?”, “I participated actively in the course”, “I think I have made progress in this course”, “I think the Course was well structured to achieve the learning outcomes”, “I understood the lectures”, “the course material was modern and updated”, "overall environment in the class room was conducive to the learning”, and “the course objective were clear”. 91% of the students strongly agreed that “Class rooms were Satisfactory”, I was happy with the amount of work needed for tutorials”, “Ideas and concept were presented clearly”, “Learning materials (Lesson planes, Course Notes etc) were relevant and useful”, “Feedback on assessment was helpful", and “The demonstrators dealt effectively with my problems”.



Where:

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

General Comments by Students about this course:

Strengths:

- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

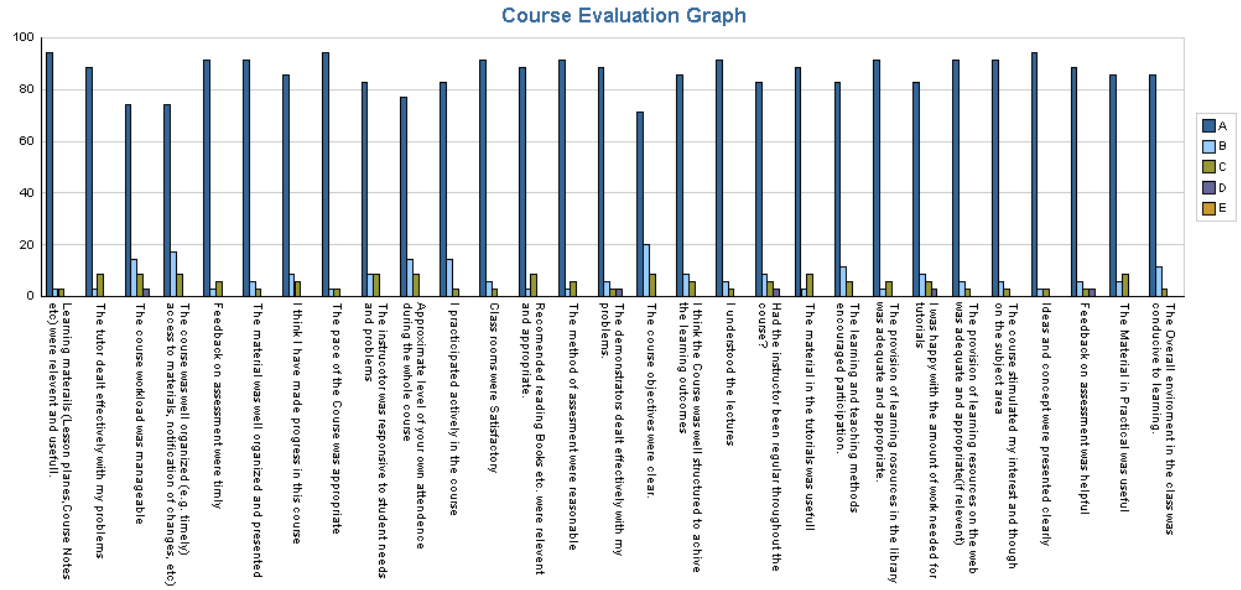
Weaknesses:

- No significant weakness was found

Mr. Ahsan Jamil (RSG-306, Spring 2017)

Evaluation: The graph shows evaluation of the course. 94% percent of the students strongly agreed that “the ideas and concepts presented clearly”, “Learning materials (Lesson planes, Course Notes etc.) were relevant and useful”, and “The pace of the Course was appropriate”. 91% of the students

strongly agreed that “The material was well organized and presented”, “The method of assessment was reasonable”, “Feedback on assessment were timely” and “I understood the lectures”. 89% of the students strongly agreed that “Feedback on assessment was helpful", “The demonstrators dealt effectively with my problems”, “Recommended reading Books etc. were relevant and appropriate”, and “The material in the tutorials was useful”. 86% of the students strongly agreed that “I think the Course was well structured to achieve the learning outcomes”, and "overall environment in the class room was conducive to the learning”.



Where: A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree
Strengths:

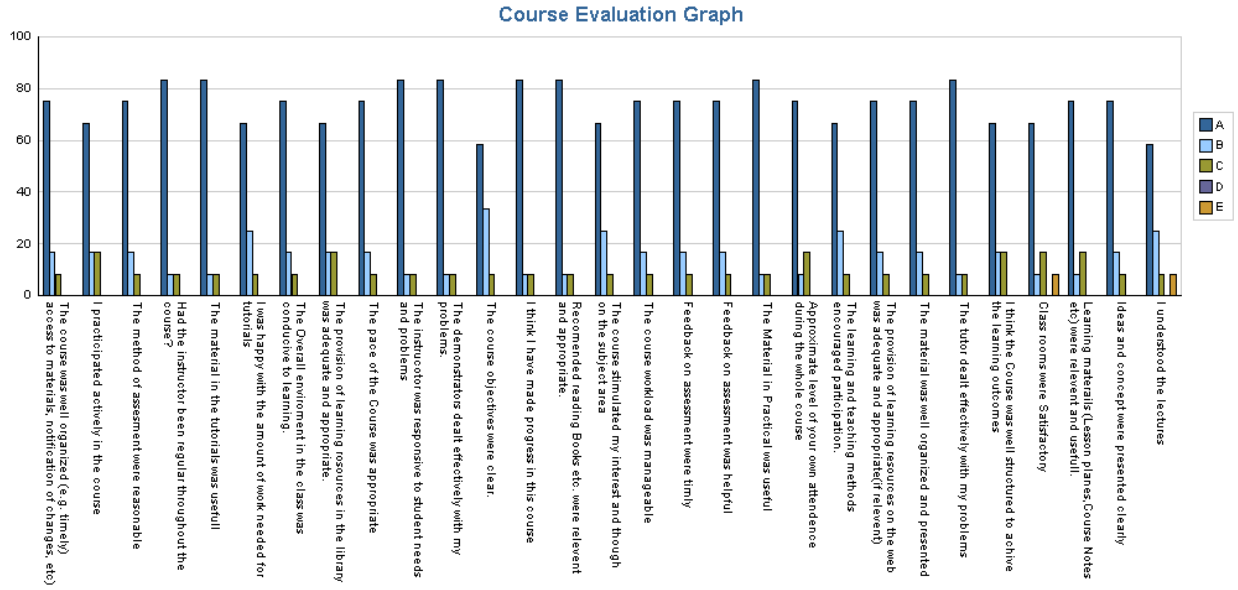
- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses:

- No significant weakness was found

Mr. Naeem Abbas Malik (RSG-402, Spring 2017)

Evaluation: The graph shows evaluation of the course. 83 percent of the students strongly agreed that "Had the instructor been regular throughout the course?", "I think I have made progress in this Course", "Recommended reading Books etc. were relevant and appropriate", "The Material in Practical was useful", "The material in the tutorials was useful", "The demonstrators dealt effectively with my problems", and "The instructor was responsive to student needs and problems". 83 percent of the students strongly agreed that "Feedback on assessment was helpful", "Feedback on assessment were timely", "Ideas and concept were presented clearly", "Learning materials (Lesson planes, Course Notes etc.) were relevant and useful", "The course was well organized (e.g. timely) access to materials, notification of changes, etc.)", "The course workload was manageable", "The material was well organized and presented", "The method of assessment were reasonable", "The pace of the Course was appropriate" and "The Overall environment in the class was conducive to learning".



Where:

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

General Comments by Students about this course:

Strengths:

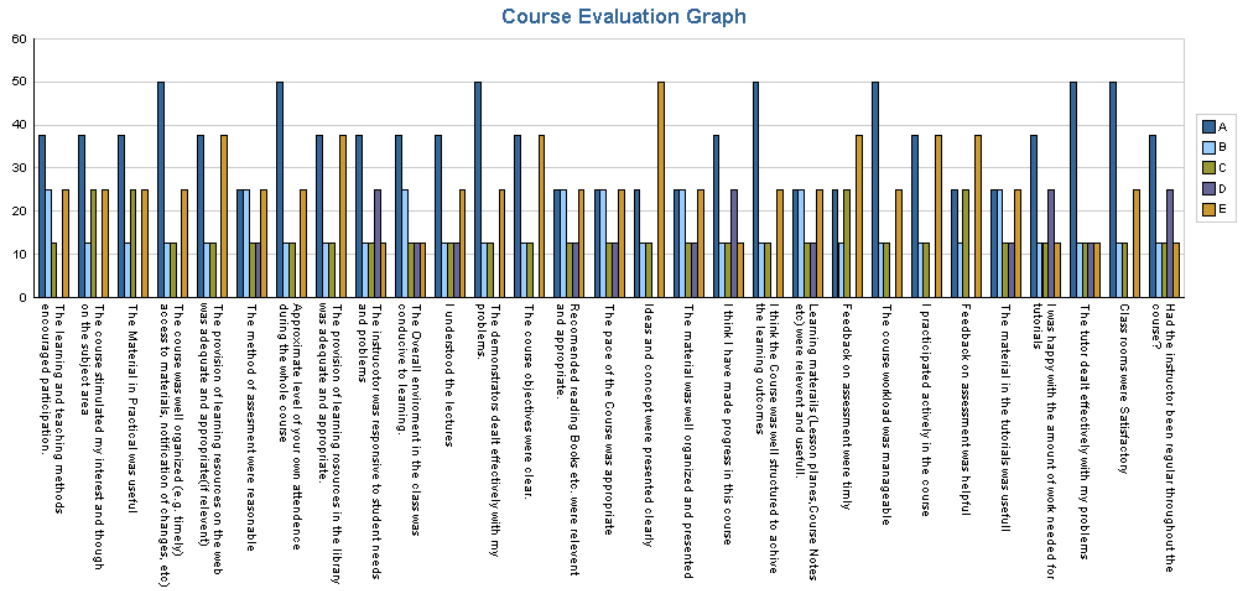
- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses:

- No significant weakness was found

Ms. Mubashra Sultan (RSG-404, Spring 2017)

Evaluation: The graph shows evaluation of the course. 50 percent of the students strongly agreed that "Approximate level of your own attendance during the whole course", "Class rooms were Satisfactory", "I think the Course was well structured to achieve the learning outcomes", "The course was well organized (e.g. timely) access to materials, notification of changes, etc)", "The course workload was manageable", "The demonstrators dealt effectively with my problems". 38 percent of the students strongly agreed that "Had the instructor been regular throughout the course?", "I think I have made progress in this Course", "I participated actively in the course", "The Material in Practical was useful", "The Overall environment in the class was conducive to learning", "The course objectives were clear", and "The course stimulated my interest and thought on the subject area".



Where:

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

General Comments by Students about this course:

Strengths:

- The Course workload was manageable
- The course simulated students interests and thought on the subject

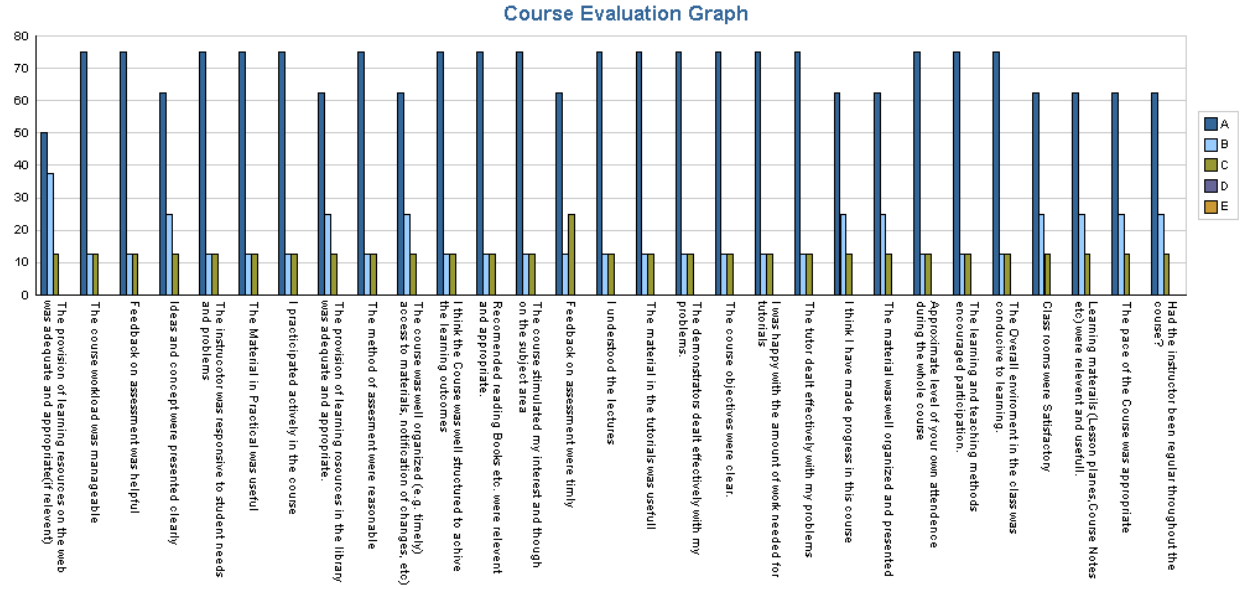
Weaknesses:

- The Course Objectives were not clear
- The course material was not well organized and presented

Mr. Shahid Amir (RSG-406, Spring 2017)

Evaluation: The graph shows evaluation of the course. 75 percent of the students strongly agreed that “I participated actively in the class", “Approximate level of your own attendance during the whole course”, "feedback on assessment was useful", “I think the Course was well structured to achieve the learning outcomes”, “I was happy with the amount of work needed for tutorials”, "I

understand the lectures", "material in practical was useful", “The overall environment in the class was conducive to learning”, “The course objectives were clear”, “The course stimulated my interest and thought on the subject area”, “The course workload was manageable”, “The demonstrators dealt effectively with my problems”, “The instructor was responsive to student needs and problems” and “The material in the tutorials was useful”.



Where:

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

General Comments by Students about this course:

Strengths:

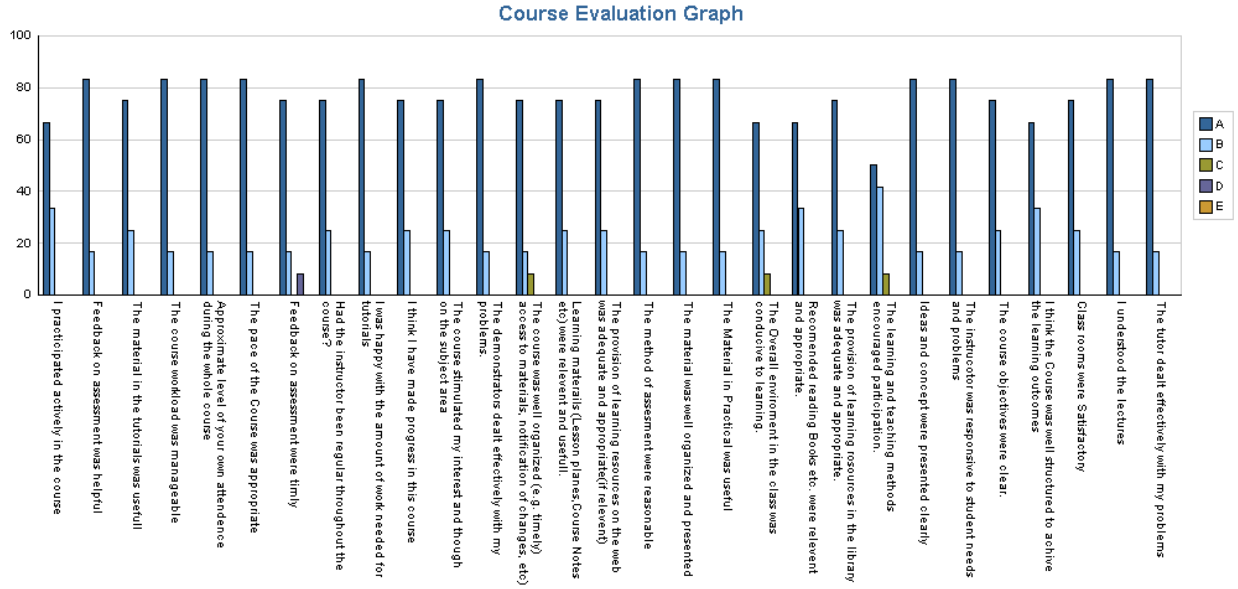
- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses:

- No significant weakness was found

Mr. Muhammad Amin (RSG-408, Spring 2017)

Evaluation: The graph shows evaluation of the course. 83 percent of the students strongly agreed that “Approximate level of your own attendance during the whole course”, “I understood the lectures”, “I was happy with the amount of work needed for tutorials”, “The course workload was manageable”, “The demonstrators dealt effectively with my problems”, “The instructor was responsive to student needs and problems”, “The material was well organized and presented”, “The method of assessment were reasonable”, “The pace of the Course was appropriate”, “Ideas and concept were presented clearly” and “Feedback on assessment was helpful". 75 percent of the students strongly agreed that " Class rooms were Satisfactory", “Feedback on assessment were timely”, “Had the instructor been regular throughout the course?”, "I think I have made progress in this subject" and "The course stimulated my interest and though on the subject area".



Where:

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

General Comments by Students about this course:

Strengths:

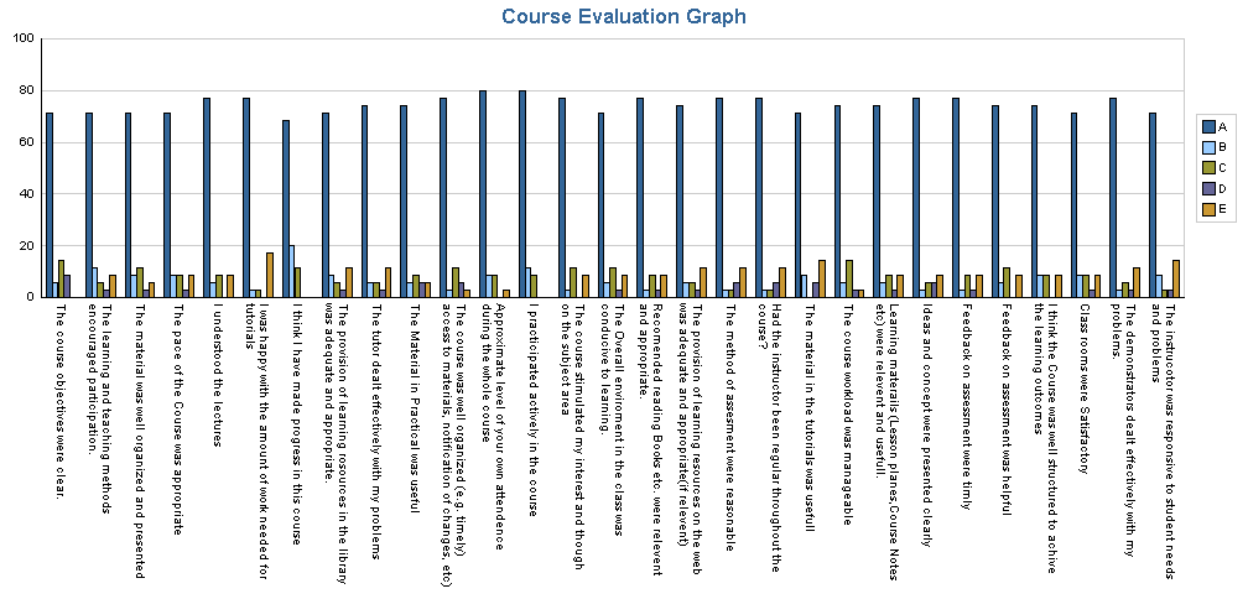
- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses:

- No significant weakness was found

Mr. Younas Khan (CS-312, Spring, 2017)

Evaluation: The graph shows evaluation of the course. 77 percent of the students strongly agreed that “Feedback on assessment were timely”, “Had the instructor been regular throughout the course?”, “I understood the lectures”, ","Recommended reading Books etc. were relevant and appropriate", “The course stimulated my interest and though on the subject area”, “The course was well organized (e.g. timely) access to materials, notification of changes, etc)”, “The method of assessment were reasonable”, “I was happy with the amount of work needed for tutorials” and “Ideas and concept were presented clearly”. 74 percent of the students strongly agreed that “Feedback on assessment was helpful", “I think the Course was well structured to achieve the learning outcomes”, "The Material in Practical was useful”, “The course workload was manageable”, “Learning materials (Lesson planes, Course Notes etc) were relevant and useful",



Where:

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

General Comments by Students about this course:

Strengths:

- The Course Objectives were clear
- The Course workload was manageable
- The course simulated students interests and thought on the subject

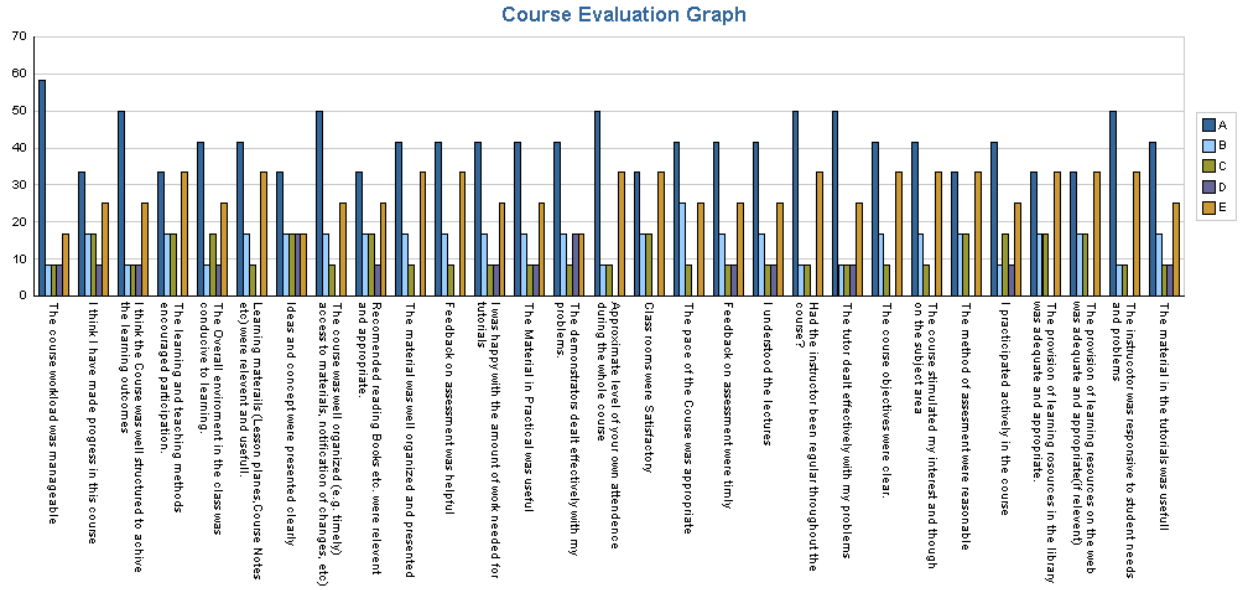
Weaknesses:

- The course material was not well organized and presented

Mr. Younas Khan (RSG-410, Spring 2017)

Evaluation: The graph shows evaluation of the course. 50% percent of the students strongly agreed that ' “Approximate level of your own attendance during the whole course”, “I think the Course was well structured to achieve the learning outcomes”, “The instructor was responsive to student needs and problems". 42% of the students agreed that "Feedback on assessment was helpful", "Feedback on assessment were timely", “The Material in Practical was useful”, “The Overall

environment in the class was conducive to learning", "The course objectives were clear", "The course stimulated my interest and thought on the subject area", "I understood the lectures", "The material in the tutorials was useful" and "The material was well organized and presented".



Where:

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

General Comments by Students about this course:

Strengths:

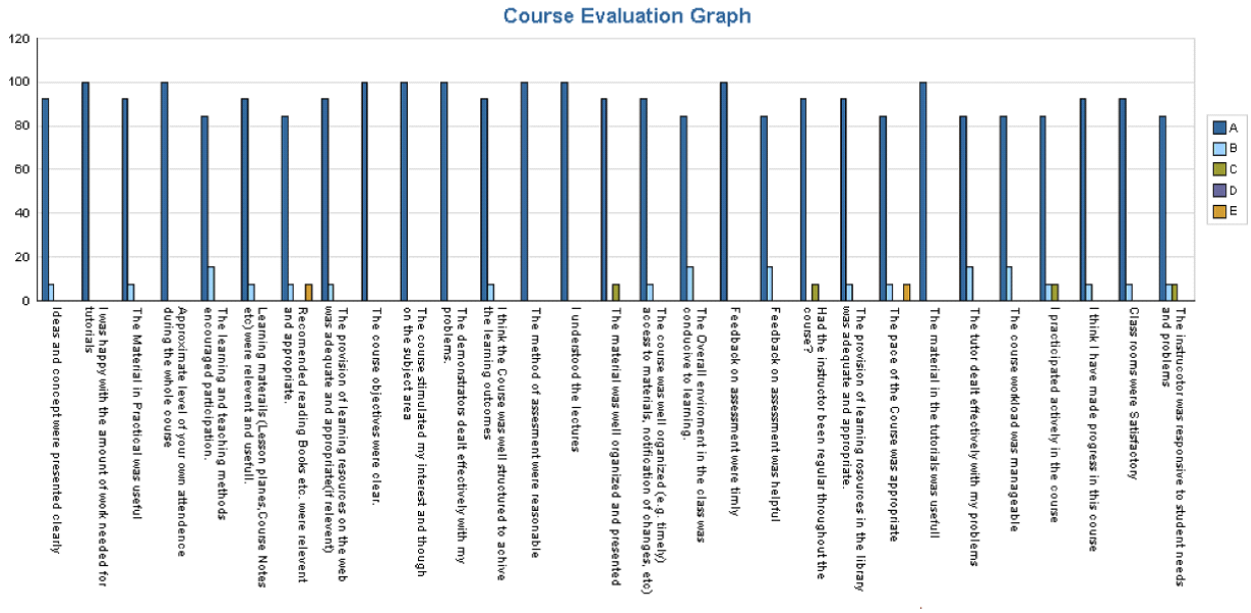
- The Course workload was manageable
- The course simulated students interests and thought on the subject

Weaknesses:

- The Course Objectives were not clear
- The course was not well organized

Mr. Usman Shaukat (HE-412, Spring 2017)

Evaluation: The graph shows evaluation of the course. 83 percent of the students strongly agreed that “Approximate level of your own attendance during the whole course"," Class rooms were Satisfactory"," Feedback on assessment was helpful", "Ideas and concept were presented clearly Learning materials (Lesson planes, Course Notes etc.) were relevant and useful", "Recommended reading Books etc. were relevant and appropriate", "the Material in Practical was useful", "The overall environment in the class was conducive to learning" and " The course objectives were clear".



Where: A = Strongly Agree, B = Agree, C = Uncertain, D = Disagree, E = Strongly Disagree
Strengths:

- The Course Objectives were clear
- The Course workload was manageable
- The course was well organized
- The course simulated students interests and thought on the subject

Weaknesses: No significant weakness was found

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

Regular assessment process started recently and in future assessments results will be incorporated accordingly. Following are the strength and weaknesses identified.

Strengths of the Program

1. Highly qualified faculty with diverse background caters the research needs of students. The faculty members have full acquaintance of their respective subjects.
2. High level of co-operation & helping attitude of the director & majority faculty members for all students in research and extra-curricular activities.
3. Curriculum is in line with current developments in the field and HEC recommendations.
4. Encouragement to work as team and independence in research thus promoting creativity.
5. The program curriculum is meeting the international job market and HEC requirements.
6. The program always promotes the innovative research ideas to solve the real-world problems of the world in general and especially in Pakistan.
7. Administration of the institute is always kind to the students in resolving their academic problems.

Weaknesses of the Program

1. Lack of dedicated internet connection and data processing lab for undergraduate students.
2. There is shortage of faculty members of each cadre. Although more faculty members are inducted but student to faculty ratio still needs to be improved.
3. Currently, very few books are available about RS & GIS in the main library as well as in departmental library.
4. Supporting staff is not available which increases the work load on faculty members.

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

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

Table 3: Present performance measures for research activities:

Faculty	Journal Publications	Conference Proceedings	Projects
Prof. Dr. Mobushir Riaz Khan	23	15	09
Dr. Muhammad Hasan Ali Baig	09	09	03
Dr. Muhammad Imran	08	06	05
Mr. Muhammad Amin	05	02	02
Mr. Naeem Abbas Malik	02	01	01

Table 4: Short courses, Seminars, Workshops and Conferences arranged by the Department

Year	Short Courses	Seminars	Workshops
2015-16	01	02	02
2016-17		02	01

2. CRITERION 2: CURRICULUM DESIGN AND ORGANIZATION

Degree title: BS Geo-Informatics

The scheme of studies for BS Geo-Informatics was designed in agreement with the international educational standards as well as in compliance with the guidelines provided by HEC. Experts and learned professors, subject specialists form other universities and research organizations at national level were involved to design the curriculum. At institute level, Board of Studies, which is comprised of senior faculty members, is responsible for updating the curriculum. This body is authorized to formulate syllabus and course contents. The courses are then sent to the Board of Faculty for approval. As per university rules, courses after the approval from the Faculty Board, are placed before the University Academic Council for final approval.

Criteria for Admission in BS Geo-Informatics

Candidates who have opted F.Sc (Pre-Engineering/Pre-Medical/ICS) with at least 45% from recognized Board or F.Sc (Pre-Agriculture) with CGPA of at least 2.50/4.00 are eligible to apply for this program.

Degree Requirements:

A student must study 136 credit hours. There are two projects of 3,3 credit hours which are included in 7^{th} and 8^{th} Semester.

Examination & Weightage:

In theory exam, student's evaluation is done by mid-term examination, assignments and quizzes and final examination. For practical subject courses evaluation is done by a practical exam as well. In case a student does not qualify in the practical examination, he/she shall be deemed to have failed in that course. Moreover, student in some courses undertake a semester project in addition to final year project.

Eligibility for Examination

A student is eligible to appear in the examination provided with at least 75% attendance.

Scheme of Studies for BS Geo-Informatics

The following is the list of courses offered to BS Geo-Informatics students.

Semester I

Course No.	Title of the course	Credit Hours
Major courses		
RSG-301	Fundamentals of Remote Sensing	**3(2-1)**
RSG-303	Introduction to Geographic Information Systems	**3(2-1)**
Minor Courses		
ENG-305	Functional English and Communication Skills	**3(3-0)**
SSH-302	Pakistan Studies	**3(3-0)**
IS-302 ET-302	Islamic Studies / Ethics	**3(3-0)**
CS-311	Computer Basics	**3(2-1)**
Total credit hours		**16**

Semester II

Course No.	Title of the course	Credit Hours
Major courses		
RSG-302	Physical and Human Geography	**3(2-1)**
RSG-304	Geo-data Capturing, Sources and Standards	**3(2-1)**
RSG-306	Introduction to Earth Sciences	**3(3-0)**
Minor Courses		
MATH-308	Linear Algebra and Applications	**3(3-0)**
PHY-310	Applied Physics	**3(3-0)**
CS-312	Fundamentals of Computer Programming	**3(2-1)**
Total credit hours		**18**

Semester III

Course No.	Title of the cours	Credit Hours
Major courses		
RSG-401	Fundamentals of Photogrammetry	**3(2-1)**
RSG-403	Cartography	**3(2-1)**
RSG-405	Geo-Database Systems	**3(2-1)**
Minor Courses		
MATH-407	Discrete Mathematics	**3(3-0)**
MATH-409	Applied Statistics	**3(3-0)**
CS-412	Object Oriented Programming	**3(2-1)**
Total credit hours		**18**

Semester IV

Course No.	Title of the course	Credit Hours
Major courses		
RSG-402	Advanced Surveying Methods	**3(2-1)**
RSG-404	Advanced Remote Sensing Techniques	**3(2-1)**
RSG-406	Geo-Statistics	**3(2-1)**
RSG-408	Navigation Systems	**3(2-1)**
Minor Courses		
CS-410	Computer Graphics	**3(2-2)**
HE-412	Landscape Modeling	**3(2-1)**
Total credit hours		**18**

Semester V

Course No.	Title of the course	Credit Hours
Major courses		
RSG-501	Digital Image Processing	**3(2-1)**
RSG-503	Computer Aided Drawing/Drafting	**3(2-1)**
RSG-505	Web GIS	**3(2-1)**
RSG-507	Spatial Data Structure and Modeling	**3(2-1)**
RSG-509	Geodesy	**3(2-1)**
Elective I One Course is to be selected		
AGR-302	Fundamentals of Agriculture	**3(2-1)**
LWCE-402	Basics of Soil Mechanics	**3(3-0)**
Total credit hours		**18**

Semester VI

Course No.	Title of the course	Credit Hours
Major courses		
RSG-502	Remote Sensing Applications	**3(2-1)**
RSG-504	Spatial Decision Support Systems	**3(2-1)**
RSG-506	Computer Programming for GIS Development	**3(2-1)**
RSG-508	Geospatial Project Management	**3(2-1)**
RSG-510	Research Methods	**3(2-1)**
Elective II One Course is to be selected		
SEE-501	Fundamentals of Environmental Engineering	**3(2-1)**
LWCE-501	Soil and Water Conservation Engineering	**3(2-1)**
Total credit hours		**18**

Semester VII

Course No.	Title of the course	Credit Hours
RSG-601	Spatial Data Infrastructure	**3(2-1)**
RSG-603	Technical Writing and Presentation Skills	**3(2-1)**
RSG-605	Elective I	**3(2-1)**
RSG-607	Elective II	**3(2-1)**
RSG-609	Final Project I	**3(2-1)**
Elective III and IV Two Courses to be selected		
RSG-611	Spectroscopy	**3(2-1)**
RSG-613	Weather Analysis and Forecasting	**3(2-1)**
RSG-615	GIS for Disaster Management	**3(2-1)**
RSG-617	Infrastructure and Transport Planing	**3(2-1)**
Total credit hours		**15**

Semester VIII

Course No.	Title of the course	Credit Hours
RSG-602	Natural Resource Management	**3(2-1)**
RSG-604	Professional Ethics	**3(2-1)**
RSG-606	Elective III	**3(2-1)**
RSG-608	Elective IV	**3(2-1)**
RSG-610	Final Project II	**3(2-1)**
Elective V and VI Two Courses to be selected		
RSG-612	Global Warming and Climate Change	**3(2-1)**
RSG-614	Paleoclimatology	**3(2-1)**
RSG-616	Microwave Remote Sensing	**3(2-1)**
RSG-618	Land Use Surveying	**3(2-1)**
Total credit hours		**15**

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

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

Table 4.4: Core Courses versus program objectives

Courses	Program objectives				
	1	**2**	**3**	**4**	**5**
RSG-303 Introduction to GIS	++++	+++	+	+	+
RSG-301 Fundamentals of Remote Sensing	+++	+++	+	+	+
RSG-405 Geodatabases	+++	+++	+++	++	+
RSG-406 Geostatistics	++	+++	+++	+++	+
RSG-404 Advanced Remote Sensing Techniques	++++	++++	++++	+++	+
RSG-501 Digital Image Processing	++++	++++	++++	+++	+
RSG-507 Spatial Data Structure & Modelling	+++	+++	++	+++	+
RSG-510 Research Methods	+	+	+++	+++	+
RSG-505 Web GIS	++++	++++	++++	+++	+
RSG-504 Spatial Decision Support System	++	++	++	+++	+
RSG-603 Technical Writing & Presentation Skills			+	+	++++
RSG-506 Computer Programming for GIS Development	+	+++	++++	+++	+

+ = Relevant, ++ = Relevant & satisfactory, +++ = Very relevant & Very satisfactory, ++++ = Highly relevant & Highly satisfactory, NA= Not applicable

Standard 2-2: Theoretical backgrounds, problem analysis and solution design must be stressed within the program's core material.

The courses taught here is the blend of theoretical and practical knowledge. Moreover, the subject practical and intellectual skills are also evaluated through term projects.

Table 4.5: Content wise grouping of core courses

Elements	Courses
Theoretical Background	RSG-301, RSG-303, RSG-304, RSG-401, RSG-403, RSG-405, RSG-408, RSG-501, RSG-502, RSG-504, RSG-404, RSG-509, RSG-510
Problem Analysis	RSG-304, RSG-405, RSG-507, RSG-508, RSG-406, RSG-601, RSG-602, RSG-605, RSG-607
Solution Design	RSG-405, RSG-505, RSG-507, RSG-508, RSG-406, RSG-601, RSG-602, RSG-605, RSG-504, RSG-606

Standard 2-3: The curriculum must satisfy the core requirements for the program, as specified by the respective accreditation body.

The curriculum is designed to meet the international educational standards as well as the Higher Education Commission (HEC) requirements.

Standard 2-4: The curriculum must satisfy the major requirements for the program as specified by HEC, the respective accreditation body / councils.

The curriculum also satisfies the general and professional as well as other discipline requirements for the program according to specification prescribed by HEC.

Standard 2-5: The curriculum must satisfy general education, arts, and professional and other discipline requirements for the program, as specified by the respective accreditation body/council.

The BS Geo-Informatics program core courses offered by the department of Geo-Informatics not only fulfill the requirements of undergraduate degree in RS & GIS disciplines but also satisfy the general education, arts, and professional requirements.

Standard 2-6: Information technology component of the curriculum must be targeted throughout the program.

Information Technology (IT) is the integral component of the BS Geo-Informatics program as the students must acquaint well with the relevant software along with programming skills for customization of GIS & RS software.

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

Assignments are given to students on specific titles (part of the course) which are presented orally and are submitted as written report, to increase their oral and written communication skills.

3. CRITERION 3: LABORATORIES AND COMPUTING FACILITIES

The information about the laboratories at the department of Geo-Informatics is as under.

Laboratory Title: GIS Lab

Location and Area:

GIS lab is in the premises of Faculty of Agricultural Engineering & Technology, Main Campus of the university. This lab is serving currently as the facility of computing and processing for BS students.

Objectives:

GIS lab is being used for practical exercises and demonstrations to the students in their introductory and major courses.

Equipment Available:

1	Computers	20
2	Smart PC	3
3	LED panel	2
4	Hp Laser Jet Plotter + Scanner Multifunction	1
5	GPS	5
6	GPS Handheld 3D	3
7	GNSS Receiver	1
8	Digitization Tablet	2
9	Stereoscopes and Accessories	5
10	Total Station	2
11	Thermal Camera	1
12	Spectrometer	1
13	Digitizing Tablet	1
14	Laser Printer	2
15	Scanner	1
16	Digital Still Camera	1
17	ArcGIS Suite	1
18	ERDAS Imagine	1

Courses Taught:

Courses which involves surveying equipment or computational facilities are taught in the GIS lab for example RSG-304, RSG-401, RSG-403, RSG-405, RSG-402, RSG-404, RSG-504.

Adequacy for instruction:

Course instructor instructs students in completing practical exercises. However, professional lab staff is required for smooth working of lab activities.

Software Available:

ArcMap, Erdas Imagine, Matlab and office programs are installed in the lab systems.

Safety Regulations:

A comprehensive list of rules and regulations is being followed in GIS lab. Few of measures are stated below.

1. Equipment must be treated with ultimate care—students will not vandalize equipment (including but not limited to: removing keycaps, marking on desk or equipment, hitting the keyboard repeatedly, slamming the mice, unplugging anything, kicking cables…etc.).
2. Report any damage to equipment or software to a lab instructor.
3. Report any suspected misuse of equipment or software to a lab instructor.
4. Do not attempt to repair or disassemble any lab equipment.
5. Do not install any hardware onto any workstation.
6. The supervising teacher must approve all external disks, CD's and any other software before use.
7. Clean up your workstation before leaving (pick up trash, make sure you are taking all your materials—only YOU are responsible for any belongings left behind).
8. Push your chair under the desk before leaving. LOG OFF and shut down the system.
9. Students are not allowed to modify anything in the control panel.
10. Do not delete, alter, or damage a computer or one of its components.
11. Do not use a computer or one of its components to disseminate copyright materials.
12. Do not insert a virus into a computer or network.
13. Do not install, or run, personal applications.
14. Do not deliberately alter the configuration or system settings of your workstation.
15. The transmission or reception of obscene, offensive or discriminatory information is unacceptable. The transmission of electronic information that is fraudulent or threatening may be just as libelous as the same information in print form.
16. The computers in the labs are provided for educational purposes and work associated with Institute. Please use them responsibly.
17. Students are not allowed to turn off computers, unless asked to do so by the teacher.
18. Students are not allowed to participate in any chat rooms on the internet or access personal e-mail accounts.
19. Students should not be in the computer lab without adult supervision.

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

Students must submit request for equipment issuance to the Lab In-Charge (Muhammad Amin). The request is then forwarded by lab In-Charge to Director IGEO for approval. However, due to absence of supporting staff, students face difficulties in proper utilizing the lab facilities. Moreover, lab is also not available to students other than class timings owing to lack of lab attendant or network administrator.

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

There is no staff available for maintaining lab resources and instructions. The class teacher is usually responsible for maintenance and guidance.

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

Only 20 computers are available to students. Therefore, students mostly work on their laptops. However, absence of supporting staff makes it very difficult for teachers and students to solve software and hardware related issues.

4. CRITERION 4: STUDENT SUPPORT AND ADVISING

The university organizes support programs for students and provide information regarding admission, scholarship schemes. Office of the Director Students Affairs also arranges various cultural activities and solve the students' problems. The Students Resource Center also advises students about future planning and job placement.

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

Courses are taught as per criteria of HEC & international standards in the field of RS and GIS. Elective courses are also offered as per guidelines of HEC.

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

Courses are structured and decided in the departmental and then in faculty board of studies meetings. To ensure effective interaction between students and faculty, at the time of course formulation both theoretical and practical aspects are focused. Students are welcomed to ask question in class and even after the class. Theoretical problems are explained, and assignments are also given to the students, whereas practical are carried out in the laboratory with the involvement of instructor directly.

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

Students are usually informed about the program requirement through the office of the head of the department. However, advising and counseling is also available through the personal communication of the teachers with the students. In addition, students can also contact with the relevant teachers whenever they face any problem.

5. CRITERION 5: PROCESS CONTROL

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

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

The admission criterion for BS Geo-Informatics program is well established and approved by the University Academic Council and Syndicate. An admission advertisement is published in the national newspapers by the Registrar Office.

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

The student files, after completion of the admission process, is forwarded to the Registrar Office for proper registration and the registration number is issued to the student. Students are evaluated through Mid, Final and Practical examinations and through assignments and surprise quizzes. Only those students, who fulfill the criteria, as notified by the Controllers of Examinations of the University, are promoted to the next semester.

Standard-5.3: The process of recruiting and retaining highly qualified faculty members must be in place and clearly documented. Also processes and procedures for faculty evaluation, promotion must be consistent with institution mission statement. These processes must be periodically evaluated to ensure that it is meeting with its objectives.

Recruitment policy followed by the University is recommended by the HEC. Faculty recruitment for 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 based on experience, qualification, publications and other qualities/activities as determined by the University.

The candidates are interviewed by the University Selection Board and principal and alternate candidates are selected. Selection of candidates is approved by the Syndicate for issuing orders to join within a specified period. Induction of new candidates depends upon the number of approved vacancies.

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

Department periodically review the curriculum depending upon new innovations and technology advancement as well as industry demands. Course books are also available in the university main library. Photocopy material (book chapters, recent research papers) are also given to the students. Most of the lectures are supplemented by multimedia presentations aided by illustrations on board.

All efforts are made that the courses and knowledge imparted meet the objectives and outcome. The progress is regularly reviewed in the staff meetings and through university quality control cell. Mechanism for generating class held reports has been developed but lack of staff is a serious hinderance in materializing all desired goals.

Standard 5-5: The process that ensures that graduates have completed the requirements of the program must be based on standards, effective and clearly documented procedures. This process must be periodically evaluated to ensure that it is meeting its objectives.

The controller of examinations announces the dates of commencement of examination. After each semester, the controller office notifies the results of the students. The evaluation procedure consists of quizzes, mid, final and practical examinations, assignments and reports, oral and technical presentations. Department itself has no such procedure due to lack of staff.

6. 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. The interest and qualifications of all faculty members must be sufficient to teach all courses, plan, modify and update courses and curricula. All faculty members must have a level of competence that would normally be obtained through graduate work in the discipline. Most of the faculty must hold a Ph.D. in the discipline.

The full-time faculty distribution by program areas is given in the following table. The faculty resumes are attached as Annexure.

Table 9: Research area wise faculty distribution

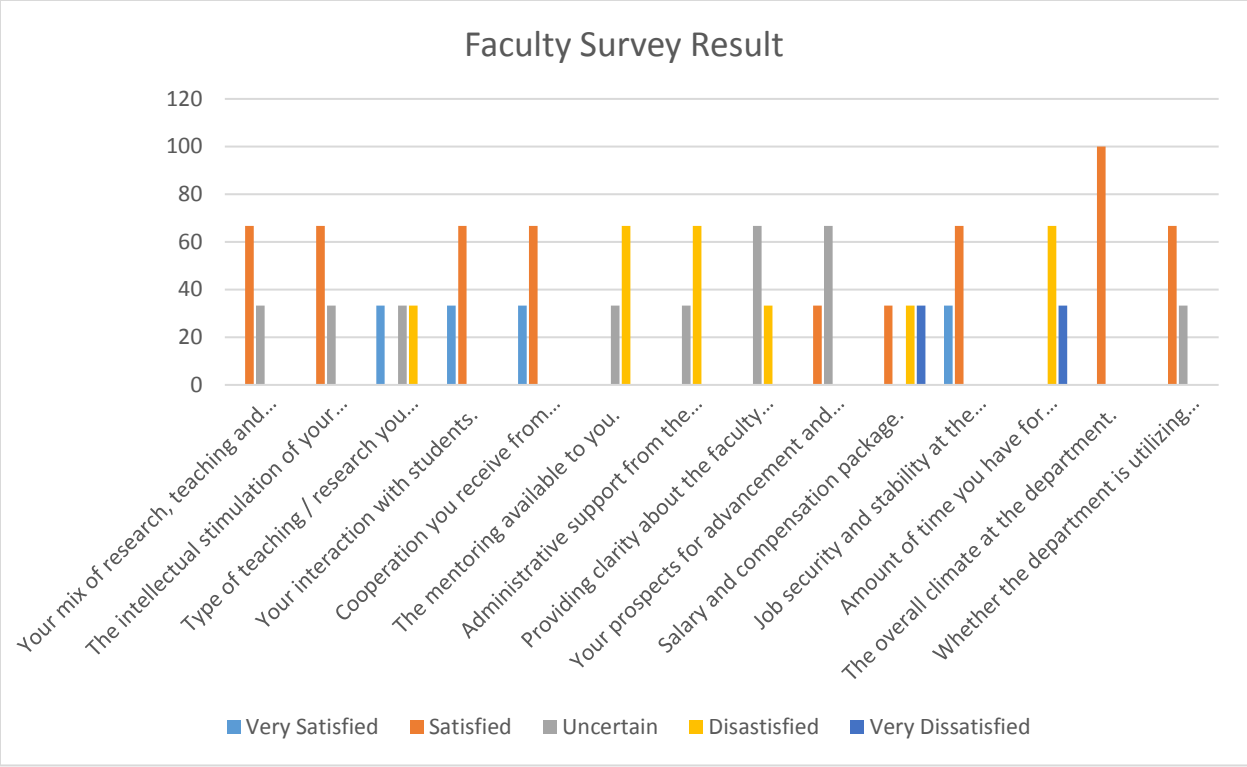
Program area of specialization	Courses in the area and average number of sections per year	Number of faculty members in each area	Number of faculty with Ph.D. degree
Applied Remote Sensing	14	2	2
Applied GIS	17	3	1

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

Professional training, research and academic opportunities are shared with the faculty members, but work load of teachers does not allow them to participate in these activities.

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

Motivation and appreciation by the senior faculty members provides enthusiasm to the young faculty members. Faculty members were given full independence in conducting research and co-curricular activities. Most of the faculty members are overburdened which hinders the process of quality education and research. The result of faculty survey table is given below.


Faculty Survey Result
120
100
80
60
40
20
0
Your mix of research, teaching and...
The intellectual stimulation of your...
Type of teaching / research you...
Your interaction with students.
Cooperation you receive from...
The mentoring available to you.
Administrative support from the...
Providing clarity about the faculty...
Your prospects for advancement and...
Salary and compensation package.
Job security and stability at the...
Amount of time you have for...
The overall climate at the department.
Whether the department is utilizing...
Very Satisfied
Satisfied
Uncertain
Disastisfied
Very Dissatisfied

7. CRITERION 7: INSTITUTIONAL FACILITIES

According to this criterion, the institution must have the infrastructure to support new trends in learning such as e-learning including digital publications, journals etc.

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

The faculty and students have access to E-library through university internet facility at main library. This facility is helpful for the high-quality education and producing research of international standard. However, a dedicated internet connection for the department is lacking.

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

IGEO is establishing its own library with appreciable number of books related to Geo-Informatics. The University Central Library is requested to provide sufficient books on the subject. Currently, very few books are available in the central library on the subject.

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

Currently there are three main class rooms for teaching Geo-Informatics courses. However, after the construction of new building more class rooms and faculty offices will be available. Multimedia are available for the lecture halls/laboratories.

8. CRITERION 8: INSTITUTIONAL SUPPORT

The university administration has been struggling hard to strengthen and upgrade all the departments and establishing new faculties and Institutes. The university is also trying to attract highly qualified faculty.

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

Office of Research Innovation & Commercialization (ORIC) provides funding opportunities to faculty members to carry out research projects and achieve competence in the relevant field.

Standard-8.2: Standard 8-2: There must be an adequate number of high-quality graduate students, research assistants and Ph.D. students.

Faculty Strength		**Students' Strength**			**Ratio**
Ph. D.	**MS**	**BS Geo-Informatics**	**MS RS & GIS**	**Ph. D. RS & GIS**	
03	02	202	42	12	**1: 51**
Total = 05		Total = 256			

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

There is an allocation of budget for the purchase of laboratory equipment, software through the project "Faculty of Agriculture Engineering & Technology". However, budget estimates for library and computing facilities are submitted to university for approval.

SUMMARY & CONCLUSIONS

The BS Geo-Informatics program was started in fall semester 2015. The program mission corresponds well with the objectives of the program and program leaning outcomes. There were different criteria to assess the program objectives with the institutional framework. The self-assessment report of the BS Geo-Informatics degree programs offered by Institute of Geo-Information & Earth Observation (IGEO) attempts to reflect the level of fulfilling the criteria devised by HEC for the award of degree programs.

The quantitative assessment of the department for the period from 2015-2017 is impressive in various categories of the degree programs thus fulfilling the HEC criteria. Each faculty member has been evaluated in terms of teaching, research output and satisfaction level depicted by students. Course evaluation system is quite effective and is being efficiently utilized by the department for quality assessment. The results of the assessment are aptly reflected in this report. Results of teacher and course evaluations were satisfactory.

Teaching load among faculty members is variable and faculty student ratio is high. Average intake of BS students by IGEO is 51 annually (enrolled students in 2015 were 25, 58 students in 2016). The faculty members use a variety of appropriate instructional techniques, dialogues and interactive discussions for dissemination of knowledge.

Curriculum contents of the program are compatible with contemporary emerging and changing needs. However, this needs to be aligned with revised HEC curriculum for BS Geo-Informatics. Textbooks and reference materials are available in the central library. However, these facilities are inadequate to cater the needs of the students. In this regard, the departmental library is required with updated books and material.

Laboratory setup is just satisfactory and needs to be strengthened gradually. The lab supporting staff for adequately and timely instructions/supervision and guidance is lacking. There should be a centralized access to study support material/lectures/assignments etc. State of the art software/equipment is required to be purchased and made available for well-equipped laboratory.

The institutional computing infrastructure and facilities are satisfactory, however enough room for improvement is there. The ground-breaking ceremony for the construction of new academic block for the faculty was held which will improve the infrastructure of the department. New building will have sufficient space for class rooms, library, seminar hall and laboratories.

Students are engaged in classes through presentations, class projects and interactive sessions which tend to provide friendly learning environment. The interaction of the students with teaching staff is encouraging and getting stronger day by day.

It is stated that the program is running successfully. However, room for improvement in every aspect of the program is there. Moreover, more faculty should be hired immediately so that there is less reliance on visiting faculty members for teaching physics, math and computer science related courses and to lessen the burdened on existing faculty members. Owing to success and importance of the program, continuation of this program is highly recommended.

ANNEXURE

Annexure I

Faculty Resumes

Name:	**Mobushir Riaz Khan**
Personal:	**Ph. D Applied Remote Sensing & GIS** **Faculty of Geo-Information Science and Earth Observation (ITC)** **the Netherlands** **Telephone**: 0092300 8305334 **E-Mail**: mobushir_riaz@yahoo.com **Website**: http://www.mriazkhan.com
Experience	Remote sensing and GIS Development expert **PMAS University of Arid Agriculture, Rawalpindi Jan 2014 till now.** **Professor Geo-Informatics/Director** **Institute of Geo-Information & Earth Observation** Successfully launched the department of Geo-Informatics in the Faculty of Agricultural Engineering and Technology (AE&T) now Institute of Geo-Information & Earth Observation. Developed and started the programs of BS Geo-Informatics, MS and Ph.D. in Remote Sensing and GIS. Responsible for teaching and undertaking multiple research activities both independently as well as with local and international collaborations. Supervising Students and development of degree programs. **Visiting Researcher, Department of Computer Science and Informatics** **Cardiff University, United Kingdom** **July 2013 till September 2013** For research and joint project formulation and building research collaborations **Associate Professor, Department of Space Science** **Institute of Space Technology (IST), Islamabad** **March 2013 till January 2014** Responsible for teaching and undertaking multiple research activities both independently as well as with local and international collaborations. Supervising Students and development of degree programs. Instrumental in starting MS Remote Sensing and GIS program at IST. **Assistant Professor, Department of Meteorology** **COMSATS Institute of Information Technology, Islamabad** **May 2011 till March 2013** Responsible for teaching and undertaking multiple research activities both independently as well as with local and international collaborations. Have been teaching courses at PhD and MS/MPhil level. -Additionally, worked as In-charge MS program Remote Sensing and GIS.

	- Designed the program of BS Geo-Informatics with the help of junior faculty members and defended in Board of Studies. The program is academically approved. - Designed the program of MS Geo-Informatics for Disaster Management with the help of junior faculty members and presented to HOD for onward submission to Chairperson for meeting of BOS. - Designed the program of MS Global Warming and Climate Change with the help of junior faculty members and defended in Board of Studies. - Secretary Organizing Committee for International Workshop on climate change and sustainable management of water resources in the Asia Pacific Region November 22-24, Islamabad. - Main Resource Person for the International Training Workshop on Use of Information Technology in Irrigation Management for Small Scale Farming Communities in Rural Areas. The Workshop is tentatively scheduled to be held from 25 - 27 December 2012 at Islamabad, Pakistan organized by CIIT, INIT and ISESCO. **Assistant Professor** **PMAS University of Arid Agriculture Rawalpindi Jan 2008 - May 2011** Was responsible for teaching and undertook multiple research activities both independently as well as with local and international collaborations. Taught several courses at PhD and M.Sc. (Hons.) and Ph.D. level. **Lecturer** **PMAS-Arid Agriculture University, Rawalpindi** **Sep 2002 - Jan 2008** Was responsible for teaching research activities. Upgraded the department's laboratories for improved research environment. Secured projects from National funding organizations and worked in national level projects in the field of entomology. • Member of the University Syndicate which is the apex decision making body after the Chancellor of the university • Organized and conducted national level and international seminars and workshop on global issues on agriculture, climate change, water crisis issues and food security. • Acknowledged for boosting the external linkages of the university. • Represented the university in Asia Pacific Network. • Mathematical modeling for climate change research core team member of PMAS- UAAR and Global Change Impact Studies Center. • Coordinator of the evening program for the Faculty (09 Departments). **Technical Staff officer to the Vice Chancellor** **(2004 – 2006)** The key functions were: • Performed daily duties and ensuring smooth working in the vice chancellor's office • Assisted Vice Chancellor in his meeting and seminars

<table>
<tr><td></td><td colspan="3">• Organized International seminars and workshops
• External linkages of the university</td></tr>
<tr><td>Memberships</td><td colspan="3">• Secretary of the first HEC recognized “Pakistan Council of Remote Sensing and GIS”
• Member and secretary “HEC Curriculum Review and Revision Committee on RS and GIS
• Member “HEC Curriculum Review and Revision Committee on Disaster Management
• Member Syndicate, PMAS-Arid Agriculture University, Rawalpindi, Pakistan (2005-2006)
• Member International Society for Photogrammetry and Remote Sensing (ISPRS)</td></tr>
<tr><td rowspan="20">Graduate Students
Undergraduate Students
Honor Students</td><td>Year</td><td>Degree</td><td>Name</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Mubashra Sultan</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Rizwan Ali</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Kamran Ahmad</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Javed Iqbal</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Syeda Hifza bokhari</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Muhammad Amin</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Sheema Wadood</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Muhammad Javed Iqbal</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Muhammad Umair</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Aqil Tariq</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Zaheer Abbas Babar</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Hannan Mehmood</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Zareen Rauf</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Usman Akram</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Muhammad Shahid Iqbal</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Hayat khan</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Syed Ali jawad</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Muhammad Bilal Iqbal</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Muhammad Sami ur Rehman</td></tr>
<tr><td>Service Activity</td><td colspan="3">Carried out various national and international projects</td></tr>
<tr><td>Brief Statement of Research Interest</td><td colspan="3">Image Processing, GIS, Data Mining using integrated environments and Decision Support Systems</td></tr>
<tr><td>Publications</td><td colspan="3">1. Khan, M., Ahmed, H., Panadero-Fontan, R., Lopez-Sandez, C., Khan, M., Asif, S., Mustafa, I., Ali, M., Raza, H., & Qayyum, M. (2015). Risk mapping of bovine hypodermosis using geographical information system (GIS) in cattle of subtropical region, Pakistan. The Journal Of Infection In Developing Countries, 9(08), 872-877. doi:10.3855/jidc.5387

2. S. Hasson, V. Lucarini, M. R. Khan, M. Petitta, T. Bolch, and G. Gioli. (2013) Early 21st century climatology of snow cover for the western river</td></tr>
</table>

	basins of the Indus River System. Hydrol. Earth Syst. Sci. Discuss., 10, 13145-13190, 2014 (IF JOURNAL) 3. Arshad M, Ahmed N, Mustafa I, Khan M R, Ahmed H." Avifauna Studies in Co-Relation with Alteration in Climatic Patterns and Hydrology of Uchalli Lake, Punjab, Pakistan". Pakistan J. Zool., vol. 46(2), pp. 0-0, 2014 (PJZ-1583-13) 2014. ISI Indexed, NATIONAL (Impact factor: 0.333). 4. Khan, M.R., de Bie, C.A.J.M., van Keulen, H., Smaling, E.M.A. and Real, R. (2010) Disaggregating and mapping crop statistics using hypertemporal remote sensing. International Journal of Applied Earth Observation and Geoinformation 12, 36-46. (IF JOURNAL) 5. Ahmed, H., Khan, M. R., Fontan, R. P.Sandez C. L., Iqbal, M. F., Naqvi, S. M. S. and Qayyum, M.(2012) Geographical Distribution of Hypodermosis (Hypoderma sp.) in Northern Punjab, Pakistan, Kafkas Univ. Vet. Fak. Derg. 18: A215-1219, 2012. (IF Journal). 6. de Bie, C.A.J.M., Khan, M.R., Smakhtin, V.U., Venus, V., Weir, M.J.C. and Smaling, E.M.A. (2011). Analysis of multi temporal NDVI SPOT images for small scale land use mapping. International Journal of Remote Sensing, 32 (2011)21 pp. 6673-6693. (IF JOURNAL) 7. Naeem M., F. Shahzad and M. R. Khan, (2005) Biosytematics of Aphid Parasitoids (Hymenoptera: Aphidiidae) from Potohar Region of the Punjab (Pakistan). Entomologists Monthly Magazine 141:219-226 London. (INDEXED, HEC RECOGNIZED) 8. Bodlah, I, M. A. Bodlah, T. Akhtar, M. Naeem and M. R. Khan., (2011) Record of Delta dimidiatipenne in space and time (de Saussure, 1852) (Hymenoptera: Eumininae, Vespidae) from Barani areas of Punjab Province of Pakistan. Pakistan Journal of Zoology. 43(5).1019-1020. (IF JOURNAL) 9. Khaliq A., M. R. Khan., Khan L., (2003) Incidence of Infestation and Parasitization of Codling Moth, Cydia pomonella (L.), in Murree Hills (Punjab). Pak Entomol. 25: 69-72. (INDEXED, HEC RECOGNIZED) 10. Bodlah I., Naeem, M., Khan, M. R., Bodlah M. A., and Akhter T., (2012) Genus Delta De Saussure (Hymenoptera: Eumininae, Vespidae) from Punjab Province of Pakistan. Pakistan Journal of Zoology. 44 (3). 759-7644. (IF JOURNAL) 11. Mustafa, I., Raza, A., Arshad, M., Ahmed, H., Khan, M. R., and Ahmad, I., (2013) Correlation of Citrus Leaf Miner (Phyllocnistis citrella Stainton) with Snail Population in District Sargodha Punjab, Pakistan, Pakistan Journal of Zoology, vol. 45(2), pp. 453-458, 2013 (PJZ-1158-12). (IF JOURNAL)

	12. Iqbal, M. F., Khan, M.R., and Malik, A.H. (2012) Land Use Change Detection in the Limestone Exploitation area of Margalla Hills National Park (MHNP), Islamabad, Pakistan using Geo-spatial techniques, Journal of Himalayan Earth Sciences, Volume 46 (1), (INDEXED, HEC RECOGNIZED) 13. Ahmed H, Khan M R, Panadero-fontan R, Sandez C L, Mustafa I, Ghani A, Hussain M, Asif S, Ahmad A , Naqvi SMS, Qayyum M. Prevalence of Bovine Hypodermosis in Water Buffalo (Bubalus bubalis) from Jhelum District, Pakistan. Kafkas Univ. Vet. Fak.. Derg. 19 (1): 79-84, 2013, ISI Indexed, INTERNATIONAL (Impact factor). DOI: 10.9775/kvfd.2012.7227 14. Ahmed H, Khan M. R, Panadero-fontan R, Sandez C L, Qayyum M. Development of Indirect ELISA for the Diagnosis of Bovine Hypodermosis (Hypoderma lineatum) in the Cattle of Subtropical Region of Pakistan. Kafkas Univ. Vet. Fak. Derg. 19 (6), 1017-1022, 2013, ISI Indexed, INTERNATIONAL (Impact factor: 0.495). DOI: 10.9775/kvfd.2013.9348 15. Ahmed H, Khan M R, Panadero-fontan R, Sandez C L, Qayyum M. Influence of epidemiological factors on the prevalence and intensity of Hypoderma sp. in cattle of Potowar Region, Pakistan. (Pak. J. Zoo). Pakistan J. Zool., vol. 45(6), pp. 1495-1500. 2013 ISI Indexed, NATIONAL (Impact factor: 0.333). 16. Mustafa I, Raza ABM, Arshad M, Ghani A, Khan M R Ahmed H. Population Dynamics of Citrus Leaf Miner (CLM) (Phyllocnistis citrella: Stainton) on Different Species of Citrus in Correlation with Abiotic Environmental Factors in District Sargodha Punjab Pakistan. (Phytoparastica). 2013, ISI Indexed, INTERNATIONAL (Impact factor: 0.80). DOI: 10.1007/s12600-013-0365-2 17. Arshad M, Siddique F, Ahmed S, Mustafa I, Anwar P, Asif S, Khan M. R. Ahmed H. An epidemiological study on prevalence of Goat Warble Fly Infestation (GWFI) in Punjab Province, Pakistan. Kafkas Univ. Vet. Fak. Derg. 20 (1): 35-40, 2014, ISI Indexed, INTERNATIONAL (Impact factor: 0.495). DOI: 10.9775/kvfd.2013.9402 18. Khan, M.R., de Bie, C.A.J.M., van Keulen, H., Smaling, E.M.A. and Real, R. (2013) Integrating soil maps in a model to map crop areas using hypertemporal remote sensing and crop statistics. Revised and Resubmitted in International Journal of Applied Earth Observation and Geoinformation. (IF JOURNAL) 19. Mustafa I, Saman, Asif S, Khan M R, Ahmed H.". “Association of citrus leaf miner with leaf biochemical factors (Ca+2, K+ and Mg+2) in kinnow

	leaves of district Sargodha, Punjab Pakistan". (Pak. J. Zoo). Accepted. In Press. 2014. ISI Indexed, NATIONAL (Impact factor: 0.333). 20. Mustafa I, Kamran R, Khan M R, Ahmed N, Ahmed H." Comparative metal profile in different organs of House Sparrow (Passer domesticus) and Black kite (Milvus migrans) in Sargodha district, Punjab Pakistan. Pak. J. Zoo, vol. 47(4), pp. 1103-1108, 2015, NATIONAL (IF: 0.40). 21. Arshad M, Ahmed N, Ghani A, Khan M R Mustafa I, Ahmed H." Population Dynamics of House Sparrow (Passer domesticus) and House Crow (Corvus splendens) in Punjab (District Sargodha), Pakistan. Pak. J. Zool l. 47(4), pp. 1147-1155, 2015. ISI Indexed, NATIONAL (IF: 0.40). 22. Mustafa I, Abrar M, Waheed M, Ahmed H, Khan M R, Panadero-fontan R, Sandez C L, Farooq M, Naqvi SMS, Qayyum M. "Newcastle disease as an emerging disease in Peacock of Tharparkar region of Pakistan. Journal of Infection in Developing Countries (JIDC). Accepted. In Press. xx(x), pp. xxx-xxx, 2015. DOI: 10.3855/jidc.5258 ISI Indexed, INTERNATIONAL (Impact factor: 1.30). 23. Mustafa I. Shahbaz M. Asif S, Khan MR, Saeed U, Sadiq F, Mehmood T, Ahmed H, Simsek S. Prevalence & characterization of Hydatidosis (Echinococcus granulosus) isolates in different organs of ruminants (Cattles, Sheeps, Goat) in Central Punjab, Pakistan. Kafkas Univ. Vet. Fak. Derg Accepted. In Press. xx(x), pp. xxx-xxx, 2015. ISI Indexed, INTERNATIONAL (IF: 0.26). DOI: 10.9775/kvfd.2015.13755 More research papers on Remote Sensing and GIS applications and Climate Change Impact Assessment are also in the status of submission and preparation.
Research Grants and Contracts	1. Dengue monitoring system development using RS, GIS and Web development 2. DSS for irrigation management using remote sensing and GIS 3. RESEARCH FOR AGRICULTURAL DEVELOPMENT PROGRAM (RADP) of PAKISTAN AGRICULTURAL RESEARCH COUNCIL (PARC) Project. Title: Site Selection of rain water harvesting through GIS and Remote Sensing Technology for hilly areas of D.G. Khan and Rajanpur Districts. (cost: 3.0 million PKR; Status: Approved and ongoing) (Investigator) 4. Rain water harvesting project for all villages in Potohar area by Agency For Barani Areas Development, (Abad) Twenty sites have been completed and 200 sites will be conducted afterwards 5. Remote Sensing and GIS based risk assessment in the northern areas under command of FCNA for Pakistan Army. (Team leader) 6. Coastal Communities and Climate Change: Case study of Thatta and Badin Districts. (Team leader). Funding Agency: Asian Development Bank)

	7. Remote Sensing based natural resource mapping of Chagai District, Baluchistan, Pakistan (Funding agency: Quantum Energy) Principal Investigator 8. "Biosystematics of dragonflies (Odonata) of Pakistan" (1405560 Rs.) by Higher Education Commission of Pakistan (HEC) (1-1-2005-30-09-2008) 9. Remote sensing and GIS based mapping and monitoring of agricultural land use of Pakistan (In review at PARC, cost PKR 6.5 Million)
Selected Professional Presentations	1. Resource person for Training on Farm Water Management for Baluchistan Farmers' & Agriculture Staff jointly organized by FAO and PMAS-AAUR, Pakistan January 16-25, 2014 2. Remote Sensing and GIS based analyses for identification of potential rainwater harvesting sites, Presentation delivered to Minister Food Security and Research, Delegates from Agricultural research organizations and faculty members September 27, 2013 at Koont Research Farms, PMAS-Arid Agriculture University, Rawalpindi. 3. Invited speaker on Rehabilitation of livelihood of Earthquake hit areas of Awaran, Baluchistan in September, 2013 at Ministry of defense 4. Main Resource Person for the International Training Workshop on Use of Information Technology in Irrigation Management for Small Scale Farming Communities in Rural Areas. The Workshop is tentatively scheduled to be held from 25 - 27 December 2012 at Islamabad, Pakistan organized by CIIT, INIT and ISESCO. Following presentations were made: a. Information Technology and the irrigation management b. Agro-meteorology and its role in irrigation management and crop production c. Developing web based decision support systems d. Mapping and Monitoring of small scale agricultural land use systems using Information extracted from Satellites e. Hands on Training of "Remote Sensing Image Analysis Mapping and Monitoring of small scale agricultural land use systems with special focus on water management" 5. Resource person for International Workshop on "Adaptation to Natural Hazards in Changing Global Climate Scenario" and presented Food Security with Remote Sensing in the Wake of Changing climates: Towards a Decision Support System for Policy Makers. 25-27th September, 2012 COMSTECH Building, 33 Constitution Avenue, G-5/2, Islamabad Organized by: NCEG, Peshawar-COMSTECH, Islamabad Monitoring. 6. Resource person for Inter Islamic Network on Space Sciences and Technology ISNET/CSE Workshop on Applications of Space Technology for Food Security; 9-14 July 2012 (Training Workshop 11-14 July 2012); Dakar, Senegal. Following presentations were made: a. Remote Sensing based Food Security Assessments b. Hyper-temporal Remote Sensing based Image Analysis for Crop Monitoring c. Hands on Training of "Hyper-temporal Remote Sensing Image Analysis for Crop Monitoring d. Remote Sensing and Statistical Analysis of Specific Crop Area Mapping

	e. Hands on Training of "Remote Sensing and Statistical Analysis of Specific Crop Area Mapping f. Crop Production Estimation and Crop Growth Algorithms 7. Remote Sensing and GIS based food security system and climate change impact assessment and mitigation for Pakistan, March 16-21, 2012 (Bhurban) Food Security in Pakistan: Future Challenges and Coping Strategies Jointly organized by National Ministry of Food Security and Research, FAO, WFP and National NGO'S. After this national workshop, the Food Security Policy was announced in the presence of Prime Minister of Pakistan. 8. Remote Sensing and GIS based sustainable water resource management and food security in Pakistan, March 22, 2012 Jointly organized by COMSATS Institute of Information Technology & UNESCO – Islamabad 9. Remote Sensing and GIS based analysis agricultural land use mapping in perspective of climate change, Training Course on "Understanding Natural Resources and Climate Change using Geospatial Techniques" March 12 -16, 2012, Institute of Space Technology, SUPARCO and Leads International 10. Resource person for ICIMOD, Nepal's Training in Pakistan on the role of remote sensing and GIS for climate change 11. Presentation to Ph.D. students at the Faculty of GeoInformation and Earth Observation, University of Twente during Ph.D. weekend (2010, Germany) on Efficiently Managing Ph.D. Studies 12. Quantitative mapping and monitoring of crop production systems. Presented to the scientific community on ITC Ph.D. day. The Netherlands 13. Estimation of crop production by using crop growth modeling and remote sensing inputs in the models for accurate estimation. Presented to the head and members of statistics department of Ministry of agriculture and fisheries, Andalucia, Spain 14. Impact of Climate Change on Water Resources and food security in Pakistan (together with Prof. Dr. Badar Ghauri, HOD, RS&GIS, IST, Karachi) at Pak-China Business Forum April, 15-18, 2012.
Other research or Creative Activities	**Rawalpindi Dengue Monitoring System:** For monitoring of Dengue in the region of Rawalpindi, Pakistan. Links: http://mriazkhan.com/den/denguemonitor.php Username: mobushir ; password: geotagit **Responsible Citizen's - Help Us to Improve System:** By using this system user can inform authorities about electricity theft, health related and other problem using smart phone application. Links: http://mriazkhan.com/den/citizensmonitor.php Android application is also available on Google store for installation **Crop Water Requirement Estimation System:** Crop Water Requirement Estimation System is developed to calculte the crop water

	requirement thourgh a we based application. This application uses past climate data of weather stations all over the country (Pakistan). On the basis of climate data the application determines the water requirement of crops with respect to month. Link: http://mriazkhan.com/cwr/public/cropwat.php Username: mobushir ; password: geotagit **Crop Water Requirement Estimation System Based on Daily Data:** Crop Water Requirement Estimation System is developed to calculte the crop water requirement thourgh a we based application. This application uses past climate data of weather stations all over the country (Pakistan). On the basis of climate data the application determines the water requirement of crops with respect to month. Link: http://mriazkhan.com/cwr/public/daily/cropwat-daily.php Username: mobushir ; password: geotagit **GIS Based Schools Analysis:** An interactive maps based system to view schools data Links: http://mriazkhan.com/schoolsapp/twin.php Username: mobushir ; password: geotagit **Spatial Et0 Calculator :** A desktop based application for windows to calculate Potential Evapotranspiration (ET0) for multiple stations per year Links: http://mriazkhan.com/register/register.php

<table>
<tr><td>Name:</td><td>Muhammad Hasan Ali Baig</td></tr>
<tr><td>Personal:</td><td>House No. 671, Street No.32, Sector: G-10/1, Islamabad-44000, Mobile No. 00923335297863,
Tel. No. 0092512354143, mhasanbaig@radi.ac.cn, mhasanbaig@gmail.com,
https://www.researchgate.net/profile/Muhammad_Hasan_Ali_Baig
<table>
<tr><th>DEGREE</th><th>YEAR</th><th>INSTITUTE</th></tr>
<tr><td>Ph.D. (Remote Sensing and GIS)</td><td>2011-2015</td><td>Institute of Remote Sensing and Digital Earth (RADI), Chinese Academy of Sciences, Beijing, China</td></tr>
<tr><td>M.S. (Atmospheric Physics / Meteorology)</td><td>09/2009-06/2011</td><td>Nanjing University of Information Science and Technology, Nanjing, China</td></tr>
<tr><td>M.Sc. (Applied Physics)</td><td>01/2002-12/2003</td><td>Dept. of Applied Physics, University of Karachi Karachi, Pakistan</td></tr>
<tr><td>B.Sc.(Hons) (Mathematics)</td><td>01/1999-12/2001</td><td>Dept. of Mathematics University of Karachi Karachi, Pakistan</td></tr>
</table></td></tr>
<tr><td>Experience:</td><td>Assistant Professor (Remote Sensing)
Institute of Geo-Information & Earth Observation
PMAS Arid Agriculture University Rawalpindi
2016 to date
Sr. Meteorologist
Pakistan Meteorological Department
2006 to 2016
Lecturer
Islamabad College for boys(ICB), G-6/3, Islamabad Pakistan
2004 to 2006</td></tr>
<tr><td>Honors and Awards</td><td>1. Got the best researcher award for the year 2014 for research innovation from Hyperspectral Remote Sensing Lab, Institute of Remote Sensing and Digital Earth (RADI), Chinese Academy of Sciences.
2. Got the Best Volunteer Award for volunteer services during the 35th International Symposium on Remote Sensing of Environment (ISRSE35), 22-26 April, 2013, Beijing, China.
3. Got the Excellent Student Award from The Graduate University of Chinese Academy of Sciences for the Spring Semester, 2012.
4. Nominated for Travel Grant for presenting research work in the ESA (European Space Agency), SOLAS, EGU Joint Conference, 29 Nov - 2 Dec, 2011 Frascati, Rome, Italy.</td></tr>
</table>

<table>
<tr><td></td><td colspan="3">5. Got Fully-funded Scholarship from Graduate University of Chinese Academy of Sciences for Ph.D. from Institute of Remote Sensing Applications from 2011-2014.
6. Nominated for Ph.D. against the 3 available slots for ‘Distinguished Students Category’ of Fully-funded Chinese Government Scholarship by Nanjing University of Information
Science and Technology, China.
7. Got Excellent Trainee Award among 170 participants from different universities of China and different parts of the world in the Seventh International Conference on Climate System
And Climate Change, 19-30 July, 2010, Beijing.</td></tr>
<tr><td>Memberships</td><td colspan="3">IEEE Student Member, International Society for Optics and Photonics (SPIE), The International Association for Hydrological Sciences (IAHS), Geoscience and Remote Sensing Society (GRSS), European Facility for Airborne Research (EUFAR), Earth Cube,
United Nations Sustainable Development Solutions Network (SDSN), Member of International institute for Sustainable development (IISD), International Society for Digital Earth (ISDE) 2014-2015, alumni of global change System for Analysis, Research & Training (START)</td></tr>
<tr><td rowspan="2">Graduate Students</td><td>Year</td><td>Degree</td><td>Name</td></tr>
<tr><td></td><td>MS Remote Sensing & GIS</td><td>Zahoor Ahmed</td></tr>
<tr><td>Service Activity</td><td colspan="3">Teaching and research.</td></tr>
<tr><td>Brief Statement of Research Interest</td><td colspan="3">Research Interests: Primary Production, Image Classification, Change Detection and LUCC by using Machine Learning approaches.
Ph.D Research: A Study on Exploring Remote Sensing Based Multi-band Vegetation Indices and Gross Primary Production (GPP) Estimation.
Master’s Thesis: The main work focused on using the Remote Sensing data of SST in Weather Research and Forecasting Model (WRF) and then used Babin’s Model to locate the evaporation
duct which is very important just over the sea to trap the communication signals due to the change in refractive index both from Radar and from military point of view</td></tr>
<tr><td>Publications</td><td colspan="3">SCI PAPERS and PATENTS
1. She, X.; Zhang, L.; Cen, Y.; Wu, T.; Huang, C.; Baig, M.H.A (2015). Comparison of the Continuity of Vegetation Indices Derived from Landsat 8 OLI and Landsat 7 ETM+ Data among Different Vegetation Types. Remote Sens. 2015, 7, 13485-13506. (I.F. 3.18)
2. Wang, S.; Baig, M.H.A.; Zhang, L.; Jiang, H.; Ji, Y.; Zhao, H.; Tian, J., (2015). "A Simple Enhanced Water Index (EWI) for Percent Surface Water Estimation Using Landsat Data," Selected Topics in Applied Earth Observations and Remote Sensing, vol.PP, no.99, pp.1,8.doi: 10.1109/JSTARS.2014.2387196. (I.F. 2.83)</td></tr>
</table>

	3. 张立福，**Hasan**，李**瑶**，**张**霞，岑奕，**佘晓**君，王**树东**一**种**基于**Landsat8** 星上反射率的**缨**帽**变换**方法及装置**. 201410119485.6 (Patent)** **4. Muhammad Hasan Ali Baig,** Lifu Zhang, Tong Shuai & Qingxi Tong **(2014)**. Derivation of a tasselled cap transformation based on Landsat 8 at-satellite reflectance. Remote Sensing Letters, 5:5, 423-431 (**I.F. 1.62**) 5. A Samat, P Du, **MHA Baig**, S Chakravarty, L Cheng **(2014)**. Ensemble Learning with Multiple Classifiers and Polarimetric Features for Polarized SAR Image Classification. Photogrammetric Engineering & Remote Sensing 80 (3), 239-251 (**I.F. 1.8**). **NON SCI PAPERS:** 6. Shuai Tong, Zhang Xia, Zhang Ming, **M.H.A. Baig**., **(2012)**. Accuracy analysis of lunar member extraction using simulated Chang'E-1 IIM data, Journal of Remote Sensing, Vol. 16 (6), pp 1205-1212. 7. **Baig, M.H.A., (2009)**. The Effect of Eurasian Snow Cover on the Monsoon Rainfall of Pakistan, Pakistan Journal of Meteorology, Vol. 5, Issue: 10, pp 97-107. 8. **Baig, M.H.A.,** G. Rasul., **(2008)**. Diagnosis of the Impact of Deep Depressional Activity in Northern Arabian Sea over Karachi during Monsoon. Pakistan Journal of Meteorology, Vol. 5, Issue: 9, pp 77-96. **CONFERENCE PAPERS:** 9. **Muhammad Hasan Ali Baig**, Lifu Zhang, Jiefu Dong, Yao Li, Xiaojun She, Qingxi Tong **(2014)**. Water mapping through Universal Pattern Decomposition Method and Tasseled Cap Transformation. IGARSS 2014, Canada: 4758-4760 10. Xiaojun She, Lifu Zhang, **Muhammad Hasan Ali Baig**, Yao Li **(2014)**. Calculating vegetation index based on the universal pattern decomposition method (VIUPD) using Landsat 8. IGARSS 2014, Canada: 4734-4737 11. **Baig, M.H.A**., Zhang Lifu, Wang Shudong, Jiang Gaozhen, Lu Shanlong, Tong Qingxi, **(2013)**. Comparison of MNDWI and DFI for water mapping in flooding season. IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 21-26 July, 2013, Melbourne, Australia. 12. **Baig, M.H.A**., Zhang Lifu, Bao Ying, Sun Shaojie, Cen Yi, Jiang Gaozhen, Hu Shunshi, Shuai Tong, Tong Qingxi, **(2013)**. Assessment of estimation methods for chlorophyll-a through hyperspectral insitu data and multispectral Landsat for Taihu Lake. IEEE Whispers 5th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, 25-28 June, 2013, Florida, USA. 13. **Baig, M.H.A**., Wang, Hui., Yang Lu, Wang Zhe, **(2012)**. A Preliminary study on the application of remotely sensed SST in locating evaporation duct height. Proc. SPIE 8525, Remote Sensing of the Marine Environment II, 852510 (December 11, 2012, Japan); doi:10.1117/12.976057, **http://dx.doi.org/10.1117/12.976057** 14. Zhang Xukai, Zhang Xia, Lan Qiongqiong, **Ali Baig, Muhammad Hasan (2012)**. Automated detection of coastline using Landsat TM based

	on water index and edge detection methods. EORSA, 2012 .http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6261155 15. Shunshi Hu, Lifu Zhang, **Muhammad Hasan Ali Baig**, Qingxi Tong, Xieyu Fan, **(2012)**. Using Modtran4 to Build up a general look-up-table database for Hyperspectral image atmospheric correction. IGARSS 2012, Germany.http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6350806. 16. **Baig, M.H.A., (2011)**. Interaction between Westerly and Monsoonal Troughs and their impacts on the weather of Pakistan. Published in the Proceedings of SAARC Seminar on Interaction between Westerly and Easterly Troughs and their Impacts on Weather over the SAARC Region, pp 44-53.
Other Research or Creative Accomplishments	**SUMMER SCHOOLS/ WORKSHOPS/ CONFERENCES ATTENDED:** 1. Machine Learning Summer School (MLSS 2014), 15-20 June 2014, Beijing, China. 2. Workshop on Big Data for International Scientific Programmes: Challenges and Opportunities, 8-9 June, 2014, Beijing, China. 3. Integrated Disaster Risk Science: A Tool for Sustainability, IRDR Conference, 7-9 June 2014, Beijing, China. 4. 2nd International Training Workshop on Space Technology for Disaster Mitigation, 3-13 June 2014, Beijing, China. 5. IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 21-26 July 2013, Melbourne, Australia. 6. 6th International Workshop on Remote Sensing and Environmental Innovations in Mongolia, 10-11 June 2013, Ulaanbaatar, Mongolia. 7. 35th International Symposium on Remote Sensing of Environment (ISRSE35), 22-26 April 2013, Beijing, China. 8. The First International Workshop on Diagnosis of Environmental Health by Remote Sensing, DEHRS, 23-24, December 2011, Beijing. 9. 2011 High Level Seminar on Hyperspectral Earth Observation, 1-2, December 2011, Beijing. 10. Seventh International Conference on Climate System and Climate Change, 19-30 July, 2010, Beijing. 11. Targeted Training Activity (TTA): Seasonal Predictability in Tropical Regions organized by *The Abdus Salam* International Centre for Theoretical Physics (ICTP), Trieste, Italy from 4-9 August, 2008. 12. Workshop on Multi-scale Predictions of the Asian and African Summer Monsoon held in Trieste, Italy from 11-15 August, 2008. 13. National Seminar on State and Challenges of GIS and Remote Sensing Applications in Water Sector at PCRWR, Islamabad in June, 2008.
Selected Professional Presentations	1. 2nd International Training Workshop on Space Technology for Disaster Mitigation. 3-13th June 2014, Beijing, China. Organized by CAS, TWAS, and SDIM (RADI). 2. Operation of ASD Spectrometer (ASD FieldSpec 4 & HandHeld 2) and Analysis of Spectral Signatures, A 2-days workshop at RADI by Dr. Brian

	Curtiss (Co-Founder, Chief Technology Officer – NIR, ASD Inc.), Beijing in September 2013. 3. Attended "Hyperspectral image analysis: algorithms and implementations" organized by CEODE and HyperComp, A one-week training course studied at CEODE by Antonio Plaza and Jun Li of Escuela Politécnica de Cáceres, University of Extremadura, Cáceres, Beijing in August, 2013. 4. Attended the 2-days training organized by CEOP-AEGIS, 25-26 April, 2013, Beijing, China. CEOP-AEGIS is an international cooperation project between Europe and Asia to improve knowledge on hydrology and meteorology of the Tibetan Plateau and its role in climate, monsoon and extreme meteorological events. 5. CAS-START Training on Regional Climate Change, Institute of Atmospheric Physics, START Regional Centre for East Asia, Beijing, China, 7th-24th October 2012. 6. Advanced Training Course in Land Remote Sensing, ESA – MOST China Dragon Cooperation, National Key Laboratory of Microwave Imaging Technology, Institute of Electronics, Chinese Academy of Sciences, Beijing, China, 15th-20th October 2012. 7. Advance Training on Remote Sensing and Geographical Information Systems (GIS), SUPARCO HQs., Karachi, Pakistan from 13-24th July 2009. 8. Training Course on Regional Atmospheric Modelling (RAMS): Plume Dispersion & Photochemistry, conducted from 15-17 October 2008 at Department of Nuclear Engineering, Pakistan Institute of Engineering and Applied Sciences (PIEAS) by Dr. Gustavo Sosa (IMP Mexico) and Madam Virgina R. Mora (IMP Mexico). 9. Analysis of Spatially Distributed Meteorological Data, A two-week training course studied at GCISC by Dr. Sultan Hameed of Institute of Terrestrial and Planetary Atmospheres, Stony Brook University, US in July 2008. 10. Two weeks training Course on High Resolution Regional Model (HRM) of Deutsche Wetterdienst (DWD), Germany at Research and Development Division, Pakistan Meteorological Department, Islamabad organized by PMD in collaboration of DWD, Germany from 25th June to 6th July 2007. 11. Completed one-year WMO's 'Basic Forecasting Course' from 2007-2008 from Institute of Meteorology & Geophysics, Karachi. 12. Completed six months WMO's Preliminary Meteorological Course from 2006-2007 from Institute of Meteorology & Geophysics, Karachi.

Name:	**Muhammad Imran**
Personal:	Ph.D Geo-information Science and Earth Observation Tel. No +92 (308) 4510 500 , Email: imran.igeo@uaar.edu.pk NIC:3820110591373 ,DOB:01-08-1974
Experience:	**Assistant Professor** Institute of Geoinformation & Earth Observation (IGEO), University of Arid Agriculture, Rawalpindi Apr 2017 to present RS image processing, Integration of spatial and non-spatial data sets, Spatial statistical analysis, GIS, Geodatabase programing, Hyper-Temporal Earth Observation Data Analysis for Food Security and Biodiversity Assessment **Assistant Professor** Center for Geographical Information Systems Punjab University College of Information Technology University of Punjab, Lahore, Dec 2013 to Apr 2017. RS image processing, Developing and establishing very large Geodatabases for projects, Geospatial data mining, Spatial statistical analysis, WEBGIS **Researcher** Department of Geo-information Processing, Faculty of Geo-information Science & Earth Observation (ITC), University of Twente, Enschede, The Netherlands Mar 2009 to Oct 2013 Analyzing remote sensing data for large scale mapping Modelling Geospatial data of various formats and domains for the integrated analysis of sustainable agriculture Spatial statistical/numerical modeling for environmental / landscape services at the regional scales, Designing and establishing service-oriented architectures for SDI-based landscape services to share data and models, and, in this way, developing location-based decision support systems Designing and implementing Geodatabases **Deputy Director** Directorate of Information Technology, Pakistan Railways, Mar 2003 to Oct 2007 Team lead for developing freight container tracking system using RS & GIS Team lead for designing and implementing spatial business intelligence and data warehousing systems for spatial (and non-spatial) data mining and reporting

<table>
<tr><td></td><td colspan="3">Team lead for designing and implementing database system for reservation and ticketing

Software Engineer
FaujiSoft (Fauji Foundation), Lahore,
Apr 2001 to May 2003
Design & management of apatial (and non-spatial) databases, mining spatial and non-spatial data
Programming languages Java, C++, Oracle SQL & PLSQL

Computer programmer & Database Administrator
Nicon Center for Computer Sciences, Lahore
Dec 1999 to Apr 2001
Database design & management
Programming languages Java, C++, Oracle SQL & PLSQL</td></tr>
<tr><td>Honors and Awards</td><td colspan="3">Higher Education Commission of Pakistan (HEC) recognized Ph.D. supervisor, 2014
Full MS and PhD scholarship awards from NUFFIC, The Netherlands, 2007</td></tr>
<tr><td>Memberships</td><td colspan="3">Member of American Society of Agronomy, 2013 – present
Fellow of Research School for Socio-Economic and Natural Sciences of the Environment (SENSE)
Netherlands, 2009 – present
Pakistan Developers Counsel, 2003 – 2007</td></tr>
<tr><td>Graduate Students</td><td>Year</td><td>Program</td><td>Student Name</td></tr>
<tr><td></td><td>2017-20</td><td>Ph. D Remote Sensing & GIS</td><td>Ansar Ali</td></tr>
<tr><td></td><td>2017-20</td><td>Ph. D Remote Sensing & GIS</td><td>Shahid Amir</td></tr>
<tr><td></td><td>2017-20</td><td>Ph. D Remote Sensing & GIS</td><td>Javaid Iqbal</td></tr>
<tr><td></td><td>2017-18</td><td>MS Remote Sensing & GIS</td><td>Waleed Akbar</td></tr>
<tr><td></td><td>2017-18</td><td>MS Remote Sensing & GIS</td><td>Hina Siddique Ch</td></tr>
<tr><td></td><td>2017-18</td><td>MS Remote Sensing & GIS</td><td>Shoaib Farooq</td></tr>
<tr><td></td><td>2017-18</td><td>MS Remote Sensing & GIS</td><td>Umair Ahmad</td></tr>
<tr><td></td><td>2017-18</td><td>MS Remote Sensing & GIS</td><td>Sayyed Faisal Sajjad</td></tr>
<tr><td>Service Activity</td><td colspan="3">Teaching & Research</td></tr>
<tr><td>Brief Statement of Research Interest</td><td colspan="3">RS image processing, Integration of spatial and non-spatial data sets, Spatial statistical analysis</td></tr>
<tr><td>Publications</td><td colspan="3">Imran, M., Zurita-Milla, R, Stein, A. (2013). Modeling crop yield in West-African rainfed agriculture using global and local spatial regression. Agronomy Journal:105(4). doi:10.2134/. agronj2012.0370
Imran, M., Stein, A., Zurita-Milla, R. (2014). Investigating rural poverty and marginality in Burkina Faso using remote sensing-based products. International Journal of Applied Earth Observation and Geoinformation: Volume 26, Pages 322–334. doi:10.1016/j.jag.2013.08.012</td></tr>
</table>

	Imran, M., Stein, A., Zurita-Milla, R. (2015). Using Geographical Weighted Kriging for crop yield mapping in West Africa. International Journal of Geographic Information Science: 29(2):1-24 doi:10.1080/13658816.2014.959522 Athar, A., Imran, M., Shahbaz, A. (2015). Protecting Agricultural Land in Developing Countries: A Case Study from Lahore, Pakistan. International Journal of Advanced Remote Sensing and GIS: 4(1), pp. 1181-1194 Imran, M., Athar, A., Rehman, A. (2016). Mapping Soil Electric Conductivity using Bayesian Kriging – A case study from Qasur, Pakistan. Geological Society of India: 88., pp.711–717 Misbah Jabeen, Yuan Qinjian, Zhang Yihan, Munazza Jabeen, Muhammad Imran. (2017). Usability study of digital libraries: An analysis of user perception, satisfaction, challenges and opportunities at university libraries of Nanjing, China. Journal of Library Collections, Acquisitions, & Technical Services: 40(1–2) Muhammad Imran, Jahanzeb Sohail, Ather Ashraf. (2017). Using geographical information systems to assess groundwater contamination from arsenic and related diseases based on survey data in Lahore, Pakistan. Arabian Journal of Geosciences: 10:450 Nargis Kamal, Muhammad Imran. (2017). Greening the Urban Environment Using Geospatial Techniques, A Case Study of Bangkok, Thailand. Procedia Environmental Sciences: Volume 37, Pages 141–334. { Munazza Jabeen, Muhammad Imran, Kamal Badar, Muhammad Rafiq, Misbah Jabeen, Liu Yun. (2017). The status and scientific collaboration analysis of LIS research: A Chineses perspective. Malaysian Journal of Library & Information Science: 22(2) Muhammad Imran, Yusra Hameed, Nurgis Kamal, Sajid Rashid Ahmad. (2017). Investigating dengue surveillance in urban tropical areas using global and local statistical models with remote sensing data. International Journal of Environmental Science and Technology: Under review Muhammad Amin, Muhammad Imran, Moubashar Riaz Khan, Rai Niaz Ahmad. (2017). Analyzing the effect of climate change on the Ghulkin glacier mass and balance Arabian Journal of Geosciences: Under review Muhammad Imran, Tariq Bashir. (2017). Analyzing the effect of climate change on the Ghulkin glacier mass and balance Arabian Journal of Geosciences: Under review
Research Grants and Contracts	Research grant (PKR 1 million) from HEC to pursue research in the field of RS & GIS, 2014 Research grant from Bill & Melinda Gates foundation to pursue GIS research in the field of agricultural applications in West-Africa, 2009 SDI-based System for the Integrated Assessment of Agricultural Information (2013), International Institute for Geo-Information Science & Earth Observation (ITC), Enschede, Netherlands

	System for Geodata Integration for UN-Peacekeeping (2008), International Institute for Geo-Information Science & Earth Observation (ITC), Enschede, Netherlands Spatial Business Intelligence System (2006), Directorate of Information Technology, Pakistan Railways, Lahore, Pakistan Freight Container Tracking System (2005), Directorate of Information Technology, Pakistan Railways, Lahore, Pakistan Fare Management System (2004), Directorate of Information Technology, Pakistan Railways, Lahore, Pakistan Reservation and Ticketing System (2003), Directorate of Information Technology, Pakistan Railways, Lahore, Pakistan
Selected Professional Presentations	Imran, M. (2010) SDI - based architecture for integrated agricultural assessments and decision - making by farmer communities in sub - Saharan Africa. In: Proceedings of the GIScience 2010 doctoral colloquium, Zurich, Switzerland, September 2010 / J.O. Wallgrün, A.-K. Lautenschütz. - Heidelberg: Akademische Verlagsgesellschaft, 2010. - 86 p. ; 24 cm. ISBN 978-3-89838-640-1. pp.45–50. Imran, M., Zurita-Milla, R. and de By, R.A. Integrated environmental modeling: an SDI - based framework for integrated assessment of agricultural information. Presented at AGILE 2011: the 14th AGILE International Conference on Geographic Information Science, 18-21 April 2011, Utrecht, Netherlands. 9 p. Imran, M., Zurita-Milla, R. and de By, R.A. Uncertainty in agricultural integrated assessment workflows in the SDI framework: abstract. In: Spatial statistics 2011 : mapping global change, abstracts for the conference, 23-25 March, 2011, University of Twente, Enschede, The Netherlands / editor A. Stein, , E. Pebesma, , G.B.M. Heuvelink. - Enschede: University of Twente Faculty of Geo-Information and Earth Observation ITC, 2011. 1 p http://intranet.itc.nl/papers/2011/pres/imran_unc.pdf. Imran M. (2005) Distributed Database Systems in Pakistan Railways. Pakistan Developer. Conference, June13-15 2005, Karachi, Pakistan

Name:	**Muhammad Amin**
Personal:	Contact No: Mob +92-321-7210752 ------- Office +92-51-9292163 E-mail: m.amin@uaar.edu.pk , aminspacian@gmail.com Nationality: Pakistan
Education	**Education** **Title of qualification awarded:** Master of Philosophy (MS) in Remote Sensing and GIS **Research Thesis Title** Harvesting Scarce water by conserving precipitation and surface runoff in Potohar plateau using Geo-spatial technique **Date**: June 2014-2016 **Principal subjects/ occupational skills covered**: Advanced studies included: Advance Remote Sensing, Basic and Advance GIS (Spatial Analysis, 3-D Analysis, Overlay Analysis, and Network Analysis with Topology, Hyper-Temporal RS & GIS, Hydrological Modeling, and Hydrology Tools etc). Digital Image Processing, GIS based Web Application **Name of organization providing education and training**: PMAS-Arid Agriculture University Rawalpindi Pakistan **Title of qualification awarded**: Master's Degree in Space Science Specialization RS and GIS **Dates:** August 2007 - July 2009 **Principal subjects/ occupational skills covered:** Principle studies included: Basic and advance Remote Sensing, Basic and Advance GIS (Spatial Analysis, 3-D Analysis, Overlay Analysis, and Network Analysis with Topology, Hydrological Modeling, and Hydrology Tools etc.). Digital Image Processing(Image Rectification and Mosaicking ,Image Classification etc.), Design Web Page, Add Shape file on web page, Add Layers on web page Draw legend, scale baron web page, classification, Draw queries **Name of organization providing education and training:** Department of Space Science, Quaid-e-Azam Campus Punjab University Lahore, Pakistan **Title of qualification awarded:** Bachelor of Science Degree (B.Sc) **Dates**: September 2004 - April 2006 **Principal subjects / occupational skills covered:** Principle studies included: Math A, B and Physics **Name of organization providing education and training**: Bahauddin Zikkria University Multan, Pakistan
Experience	**Occupation/Position held**: Lecturer (Geo-Informatics) **Date**: Jan 2014-Present **Main activities and responsibilities**: •Teaching at Undergraduate and Graduate Level •Research in the field of Remote Sensing & GIS •GIS and Remote Sensing Mapping/Spatial Analysis at Regional level

	Name and address of employer: Institute of Geo-Information & Earth Observation PMAS-Arid Agriculture University Rawalpindi Pakistan **Occupation/Position held:** Manager GIS & RS **Dates** Jully 2009- December 2013 **Main activities and responsibilities:** • Project Management • Digital Data Preparation • Data Management • Finalization of Project • Trimble GPS Trainer • GPS Survey Monitoring • Surveyed Data Management • Digital Maps Preparation at Different Scales • Team Management **Name and address of employer**: Daleelteq Private Limited 11-D 6Th Road Satellite Town Rawalpindi Pakistan Pakistan, Saudi Arabia, Sudan and Tunis **Type of business or sector**: (Software Services, GIS and RS Company)
Honors and Awards	**Achievements** **During job at Daleelteq following projects have been completed With International Companies** **Pakistan Project Road/Highways Navigation** Road Navigational Map for Nokia of Islamabad, Rawalpindi, Lahore, Karachi, Peshawar, Quetta, Faisalabad, Sialkot, Gujranwala, Jhelum, Gujrat, Abbottabad, Murree, Muzaffarabad, Taxila, Wah, Sargodha, Multan, Hyderabad, Bahawalpur, Sukkur, Larkana, Highways and Motorways: and working on all Cities of Pakistan with the Collaboration of ***Navteq International*** (subsidiary of Nokia). **Collection of POIs of top 54 cities of Pakistan with the help of Trimble GPS**. Work on all Pakistan Water Features(River, Canal, Lakes Reservoir) from satellite Imagery and draw their Network for Navigation purpose •**Bangladesh Project** •Currently working With the Collaboration of ***Navteq International and Mappa*** ltd 137/D/1 Jahanara Garden, Green Road, Farmgate, Dhaka-1205 Bangladesh Prepare Digital Road Navigational maps of Bangladesh all Cities. Working all Bangladesh water Feature for the purpose of Ferry Route Network through Satellite Imagery and designing their routes. **Collect Point data of Bangladesh top 12 Cities with Trimble GPS** •**Indonesia POIs Project**

	Manage and handling Navigational POIs data Collection project of Jakarta, Bekasi, Tangerang, Bogor Cities as a training consultant with Collaboration of ***Navteq International*** with Trimble GPS. **•Thailand Navigation Project** Manage and handling Navigational POIs data Collection project of Bangkok City as a training consultant with Collaboration of Navteq and EDA International with the help of Trimble Juno SB GPS. Office: 41/35 Watcharaphol Road, Taraeng, BangKhen Bangkok. **•Thailand APT Project** I supervised the preparation, editing, and testing of POI & Apt Projects by GPS with collaboration of ***Teleatlas (Tom Tom)*** (GIS services provider for Google Inc). I am assisting our Thailand office in Post processing of GIS data collected from field. Providing Navigational digital maps for survey. **During job following projects have been completed With National Companies & Govt. Sectors** **•Ministry of Science and Technology Project** Pakistan Council Of Research In Water Resources, Islamabad, Pakistan Digital Topographic Maps at 1,000,000 / 500,000 and 250,000 scale. Extract water Feature from DEM with the help of Hydrological Tools www.pcrwr.org.pk **•Population Censes Organization Project** Population Censes Organization Islamabad, Pakistan. Worked on Digital Data on 500, 00 scales for Different Districts of Pakistan and application for PC (Population Council Pakistan) marking "Health Facilities in Rural Areas of Pakistan" www.popcouncil.org **•Govt. of AJK Project** AJK Mineral Management and Information System Worked on Digital Data related Problems MMIS (Mineral Management and Information System) of AJK Government Research Report on MMIS System. **•KPK & Fata Project** Prepare all 50k scale data of KPK and Fata Layers in 50k scale data (Motorway, Highway, Provincial Roads, Provincial Boundary, District Boundary, Main City Boundary, Land use, Graveyard, Railway Line, Nalas & Canal, Rivers, Water Reservoirs, Settlements, Contours 50m)

<table>
<tr><td></td><td colspan="3">•Computerization of Property tax Record Through GIS
I supervised the project of Computerization of Property tax Record Through GIS with Directorate of IT KPK.
Prepare parcel Mapping of Peshawar Urban area.
Collect all parcels from field with Trimble GPS Juno Sb.</td></tr>
<tr><td rowspan="4">Graduate Students
Honor Students</td><td>2017</td><td>MS Remote Sensing & GIS</td><td>Ahsan Jamil</td></tr>
<tr><td>2017</td><td>MS Remote Sensing & GIS</td><td>Dilshad Bano</td></tr>
<tr><td>2017</td><td>MS Remote Sensing & GIS</td><td>Tehreem Fatima</td></tr>
<tr><td>2017</td><td>MS Remote Sensing & GIS</td><td>Alamgeer Hussain</td></tr>
<tr><td>Service Activity</td><td colspan="3">Teaching and Research</td></tr>
<tr><td>Brief Statement of Research Interest</td><td colspan="3">Geographical Information Sciences (GIS), Hydrology, Cartography, Geo-database, Remote Sensing, natural resources management; infrastructure planning, Agriculture and Navigation.</td></tr>
<tr><td>Publications</td><td colspan="3">International Journal Paper:
1. Fazal Karim1, M. Irfan Ashraf1*, M. Amin2, Mobushir Riaz Khan2, Atif Ali Khan1
“Impact of diverse factors on land-use changes using geo-spatial techniques” (Published at Journal of Agriculture and Biological Sciences) 2016 1(2):57-
67 ISSN(print): 2415-6728, ISSN(online) 2415-6736
2. Hanan Mehmood1 *, M.R Khan2, M. Amin2, Rizwan Ali3 “Delineating Surface and
Sub Surface waterlogged area using RS & GIS : A Case Study of Rachna Doab” (Published at International Journal of Advanced Geosciences)
3. Lubna Anjum1, Niaz Ahmad2, M.R Khan3, M.Amin4 , Paper ID: 1660284 Effect of
Different Irrigation and Management Practices on Soil Health using Geospatial
Techniques (Accepted at Journal OJSS) IF 0.82
4. Iqra Riaz1, MR Khan2, Muhammad Amin3, Muhammad Naveed Tahir4 “Analyzing
effect of land surface temperature on land use/land cover types based on satellite derived Indices”. (Submitted in Pakistan Journal of Botany)
5. Naveed Tahir1, Syed Shah Mohioudin Gillani1, MR Khan2, Muhammad Amin2 ,
Mubbashra Sultan2 “Evaluating the potential of LANDSAT 8 time series Imagery for estimation of wheat chlorophyll content under rainfed condition” (Submitted in Journel of Applied Remote Sensing)IF1.183
6. Rizwan Ali1*, M.R Khan2, M. Amin2, Hanan Mehmood3 "Potential of Geo-spatial Technologies for Homeland Security by Generating Incidence of Violence Risk Map: A Case Study of Pakistan" (Submitted at International Journal of Geographical Information Science: manuscript ID is IJGIS-2016-0461)</td></tr>
</table>

	7. Syed Shah Mohioudin Gillani1**,** Muhammad Naveed Tahir1, **Muhammad Amin2**, Mubbashra Sultan2, Raheel Osman1,Muqadas Ali1 "Remote estimation of wheat chlorophyll content by using satellite imagery in district Chakwal **(Submitted in Pakistan Journal of Botany)** **Conference Papers:** **1. Amin,** M., M. Usman**,** T. Iqbal and Z. Hussain. (UAF 2014). Spatio Temporal Variation of Batura Glacier Using Remote Sensing and Geographic Information Techniques. **2. M. Amin**, Niaz Amad, Mobushir Riaz, M.Usman, Abida Perveen International Conference on Aerospace Science and Engineering (ICASE 2015), Integrated use of Potential Rainwater Harvesting site for Agriculture using Geo-spatial Approach **3.** JF Punthakey, MR Khan, M Riaz, M Javed, G Zakir, M Usman, **M Amin**, RN Ahmad , J Blackwell, R Culas, IA Baig, E Christen; IAH (International Association of Hydrogeologists) Sep2015 Assessment of Surface and Groundwater Resource Use for Rechna Doab in Pakistan
Research Grants and Contracts	**Research Activities**: Research Projects: **Project Title**: Optimization Canal and Water Requirement of Rachna Doab Punjab Pakistan **Project Objectives**: ✓ To support PIDA and Farmer Organization in the implementation of more equitable, economically efficient and hydro-logically sustainable canal and groundwater management options in the study areas. ✓ To develop improved canal and groundwater management options acceptable to stakeholders by using the optimization tools in a participatory mode with Farmer Organizations ✓ To develop tools capable of analyzing hydrological and economic water management trade-off scenarios using spatial crop, soil, water availability and water quality data. **Funding Agency**: Australian Centre for International Agricultural Research (ACIAR) **Research Role**: Team Member **Project No**. LWR-2005-144 **Status:** Completed **Project Duration**: 2013-2015 ➢ **Project Title**: Rainwater Harvesting Project of all Villages of Potohar area Punjab Pakistan **Project Objectives**: ✓ To harvest scarce water by conserving precipitation and surface runoff ✓ To check the soil losses and increase it productivity through devising sustainable soil conservation measure ✓ Mobilization of resource for the uplift of rural poor **Funding Agency**: Planning & Development Punjab, Pakistan **Research Role**: Expert Team Member

	Project No. MTDF & ADP- G.S. No.674 **Status:** Ongoing **Project Duration**: 2013-2016 ➢ **Project Title**: Selection of Potential site for runoff water harvesting in D.G Khan and Rajanpur Rod-Kohi area of Pakistan using Remote Sensing and GIS Technology **Project Objectives**: ✓ To investigate surface runoff potential in D.G Khan and Rajanpur Rod-Kohi areas. ✓ To identify potential water harvesting site using high resolution DEM and ancillary data ✓ Propose strategies for effective management of surface runoff for sustainable agriculture development in rod-kohi area **Funding Agency**: Pakistan Agriculture Research Council **Research Role**: Co-P.I. **Project No.** F.1-12/2012-CS(443) **Status:** Ongoing **Project Duration**: 2014-2015 **Dates:** April 2009 - September 2013
Other Research or Creative Accomplishments	**Delivered GPS Training in Pakistan and out of Pakistan** **Training 1:** Trained Daleelteq Surveyor team in Pakistan for Navigational POIs Collection **Training 2:** Trained Buraq Integrated solutions and EDA International GPS surveyor Team in Bangkok Thailand for Navigational POIs collection. **Training 3:** Trained Daleelteq international GPS Surveyor team in Dhaka Bangladesh **Training 4:** Trained Directorate of IT and Excise & Taxation GPS surveyor team of KPK for tax collection data.

PMAS-Arid Agriculture University Rawalpindi

Institute of Geo-Information & Earth Observation

Name:	**Naeem Abbas Malik**
Personal:	Cell: +92 344 0514790, +92 334 6569580 E-Mail: naeem.malik@uaar.edu.pk , malikuaar@yahoo.com
Education	1. MS (GIS & Remote Sensing) – October 2011 Institute of GIS, www.igis.nust.edu.pk National University of Sciences & Technology, Islamabad 2. BSc (Hons) Agronomy – March 2008 PMAS Arid Agriculture University, Rawalpindi, www.uaar.edu.pk
Experience	**1. Lecturer GIS & Remote Sensing** **Institute of Geo-Information & Earth Observation** **PMAS Arid Agriculture University Rawalpindi** Murree Road, Rawalpindi, Pakistan www.uaar.edu.pk March 2015 to date ***Duties and Responsibilities*** ▪ Deliver a range of teaching and assessment activities ▪ Development and management of university research farm's agricultural spatial data ▪ Supervise Masters and undergraduate student projects ▪ Supervise and train postgraduate students to ensure their effective development ▪ Capacity development of students in using ICTs in their research projects ▪ Creating awareness and promoting the use of mobile data collection technologies for efficient data collection and management in research ▪ Participate in appropriate research seminars/conferences/workshops within subject area ▪ Participate in School research group activities and new initiatives ▪ Contribution in the on-going development and design of the curriculum, in a manner that supports a research–led approach to student learning ▪ Enhance the student learning experience ▪ Participate fully in assessment and examination process as appropriate, using a variety of methods and techniques and provide effective, timely and appropriate feedback to students ▪ Engage in knowledge exchange activities as appropriate ▪ Table new ideas for sustainable management of agriculture ▪ Promote the University's internationalization agenda ***Postgraduate & Undergraduate Courses Taught*** ▪ Introduction to GIS & Spatial Analysis ▪ Introduction to GIS Databases & Programming ▪ Spatial Data Sources & Standards ▪ Geo-Database Systems ▪ Geo-Information for Agricultural Monitoring ▪ Spatial Data Structure & Modelling ***MS Thesis Supervised***

	▪ Web based Spatial Decision Support System for Water Utilities Management ▪ Web based Spatial Decision Support System for Electrical Network Management ▪ GIS based Online Emergency Response Taking & Dispatch System ▪ Hotspot Analysis of Dengue Cases of 2015 in Rawalpindi ▪ Soil Erosion Risk Mapping in Muzaffarabad ***Ph.D. Thesis Supported*** ▪ Web based Spatial Decision Support System for Solid Waste Management **2. Project Coordinator / GIS Specialist** **City Pulse Pvt. Limited** Office 1 & 2, Zeb Arcade, G-15, Markaz, Islamabad, Pakistan www.citypulse.com.pk March 2014 to March 2015 ***Duties and Responsibilities*** ▪ Working closely with end users to identify GIS requirements, technical issues and training needs; analyzes current business processes and recommends best practice solutions; constructs information technology definitions based on identified needs of the organization ▪ Analyzing, troubleshooting and resolving GIS applications problems; communicates with internal and external technical resources to resolve end user issues; provides guidance to users on methods for correcting reported problems ▪ Generation of thematic and situation maps based on project requirements. ▪ Keeping up to date GIS data from field offices. ▪ Updating and maintenance of existing databases ▪ Supervision, analysis and making the data scrutiny. ▪ Managing the field teams for field verifications. ▪ Post processing the survey data for higher degree of accuracy. ▪ Training of the field staff on GPS/ArcGIS/Mobile based data collection. ***Projects worked at are listed below*** ***1) Electric Consumer Census for PESCO in Peshawar*** *a. Creation of census questionnaire* *b. Conversion of paper based questionnaire to digital format* *c. Establishment and maintenance of data collection and management server* *d. Training of enumerators on data collection using android devices* *e. Selection of appropriate android devices for data collection* *f. Analysis of census data* *g. Preparation of Base Maps* *h. Preparation of Electricity Distribution Network Map* *i. Weekly progress map of area enumerated through mapping consumers* ***2) Electric Consumer Census for PESCO in Charsadda***

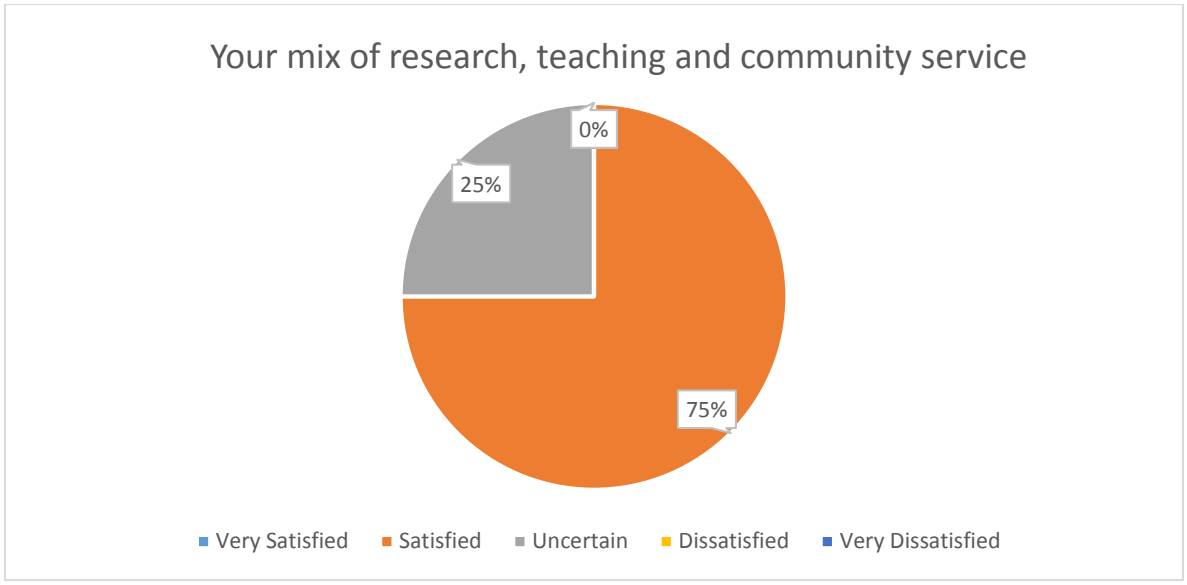
	a. Creation of census questionnaire *b. Conversion of paper-based questionnaire to digital format* *c. Establishment and maintenance of data collection and management server* *d. Training of enumerators on data collection using android devices* *e. Selection of appropriate android devices for data collection* *f. Analysis of census data* *g. Preparation of Base Maps* *h. Preparation of Electricity Distribution Network Map* *Weekly progress map of area enumerated through mapping consumers* ***3) Hazard Risk Reduction in Dera Ghazi Khan*** *a. Development and implementation of Mobile data collection mechanism* *b. Analysis of survey data* *c. Preparation of Base Maps* *d. Development of Hazard Zones in the study area* *e. Helping engineers in proposing mitigation structures through contours* ***4) Drought Profiling in District Layyah*** *Preparation of Base Maps* *Helping digitizers in digitization process* ***5) Capacity Building of Local Communities in Layyah*** *Disaster Risk Reduction Training delivered* *Community Motivation and Awareness* ***6) Expansion of Flood Early Warning System in Bhakkar*** *Digitization of Land Features* *Development of Base maps* *Development of Flood Layers* *GIS support to software development team* *Training of data collection teams* **3. GIS Software Developer** **Public Sector Organization** May 2012 to Feb 2013 ***Duties and Responsibilities*** ▪ Publishing GIS resource as web service ▪ Creating GIS web editing applications through ArcGIS Server Manager and SQL Server ▪ Deploying application through ArcGIS Server ▪ Creating and publishing offline base maps ▪ GIS based Network Analysis ▪ Connecting ArcGIS with SQL Server **4. GIS Officer**

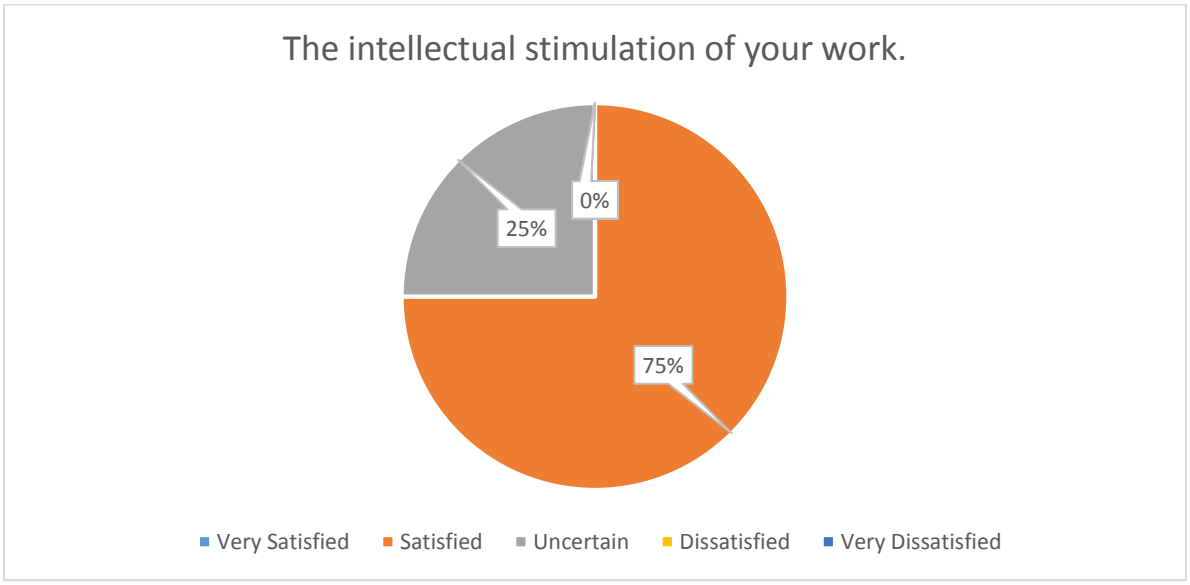
<table>
<tr><td></td><td colspan="3">Community Motivation & Development Organization (CMDO)
May 2011 to May 2012
Duties and Responsibilities:
▪ Generation of thematic and situation maps based on project requirements.
▪ Management of all the data related to project interventions including pictures, budget, and cost sheets and making them available with maps
▪ Acquisition of GIS data from different organizations
▪ Updating and maintenance of existing databases
▪ Generation of dynamic reports from the databases
▪ Conducting GPS and other basic trainings at field offices</td></tr>
<tr><td rowspan="6">Graduate Students</td><td>2015</td><td>MS Remote Sensing & GIS</td><td>Summayyah Aleem Khan</td></tr>
<tr><td>2015</td><td>MS Remote Sensing & GIS</td><td>Saadia Jannat</td></tr>
<tr><td>2015</td><td>MS Remote Sensing & GIS</td><td>Zeeshan Zafar</td></tr>
<tr><td>2015</td><td>MS Remote Sensing & GIS</td><td>Muhammad Waqas</td></tr>
<tr><td>2015</td><td>MS Remote Sensing & GIS</td><td>Ammar Akbar</td></tr>
<tr><td>2015</td><td>MS Remote Sensing & GIS</td><td>Muhammad Waqas Awan</td></tr>
<tr><td>Service Activity</td><td colspan="3">Teaching & Research</td></tr>
<tr><td>Brief Statement of Research Interest</td><td colspan="3">Spatial Data Analysis & Modelling
Utilities & networks Management
Natural Resource Management
Precision Agriculture
Geostatistics
Web GIS</td></tr>
<tr><td>Publications</td><td colspan="3">Published
▪ Hussain, A., Riaz Khan, M., Abbas Malik, N., Amin, M., Hussain Shah, M., & Naveed Tahir, M. (2017). GIS based mapping and analysis of landslide hazard’s impact on tourism: a case study of Balakot valley, Pakistan. International Journal of Advanced Geosciences, 5(2), 116-120. doi:http://dx.doi.org/10.14419/ijag.v5i2.8335
▪ Ali Baig, M. H., Sultan, M., Riaz Khan, M., Zhang, L., Kozlova, M., Abbas Malik, N., and Wang, S.: WETLAND CHANGE DETECTION IN PROTECTED AND UNPROTECTED INDUS COASTAL AND INLAND DELTA, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XLII-2/W7, 1495-1501, https://doi.org/10.5194/isprs-archives-XLII-2-W7-1495-2017, 2017.

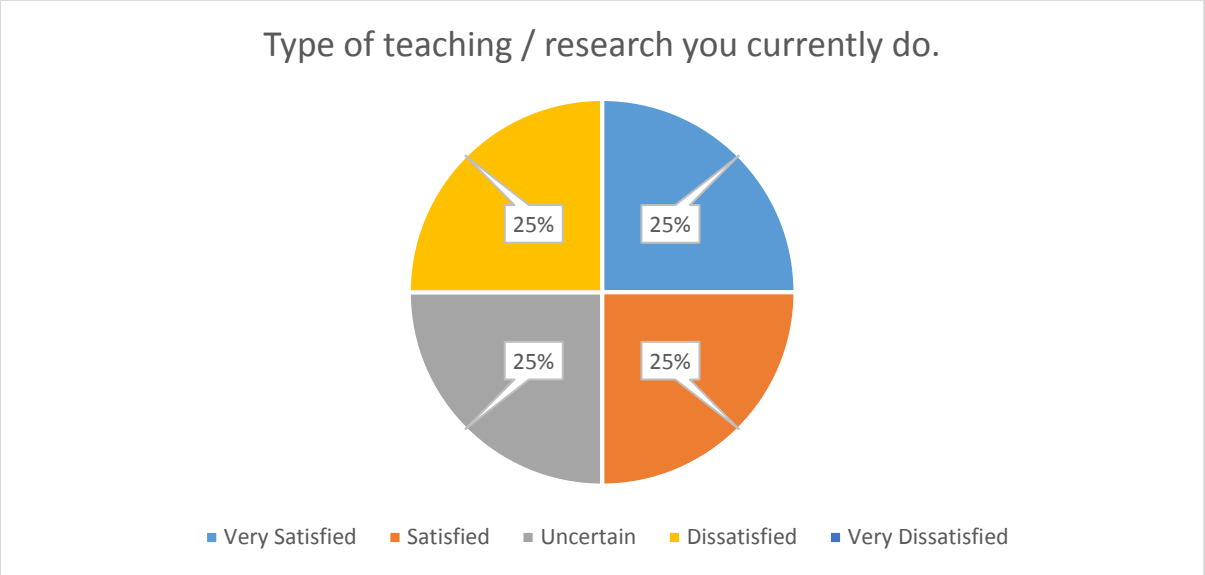
Publications in process
▪ Delineation of Crop Management Zones Using Multiyear Crop Yield Monitor Data
▪ Delineation of Soil Fertility Zones Using Soil Nutrient Data
▪ Risk Mapping of Brucellosis Disease in Punjab
▪ Mapping of Livestock Population Disparity in Punjab</td></tr>
<tr><td>Research Grants and Contracts</td><td colspan="3">Principal Investigator
“Delineation of Crop Management Zones Using Soil Chemical & Physical Properties Data”</td></tr>
</table>

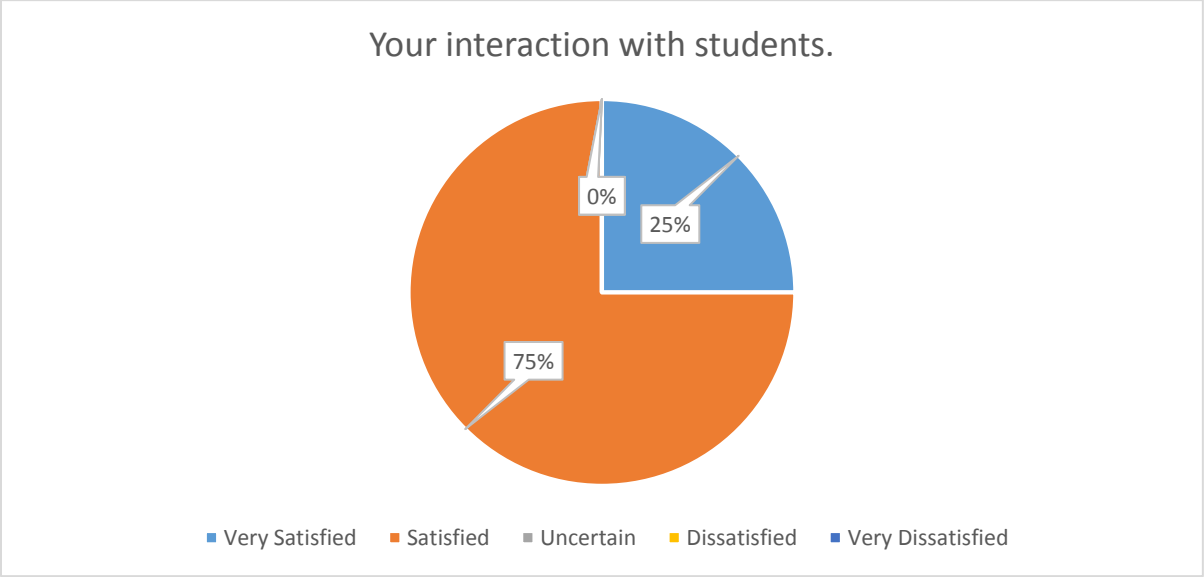
Other Research or Creative Accomplishments	**Trainings Received** ▪ 5 Days Training on National Workshop on Development and Harmonization of Land cover Classification and District Wise Forest Assessment of Pakistan by WWF & ICIMOD ▪ OASIS & SRF Training by iMMAP ▪ Training on SPSS by NUST ▪ Survey Training by 477 Army Survey Group **Trainings Imparted** ▪ 3 days Training Workshop on "GIS for Agriculture Monitoring" March 2016 ▪ 3 days Training Workshop on "Mobile GIS Data Collection & Management System" Dec 2015 ▪ 4 days GIS training given to the "Save The Children" staff ▪ 3 days GIS training given to the "Doaba Foundation" staff ▪ 2 days training on Early Warning System given to "Doaba Foundation" staff

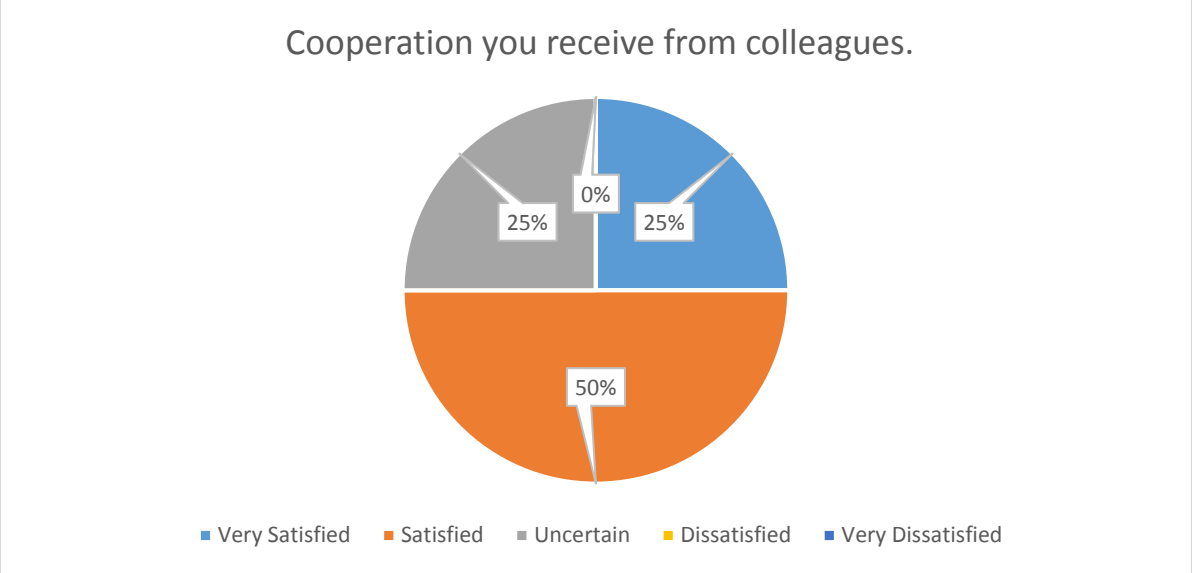
Faculty Survey

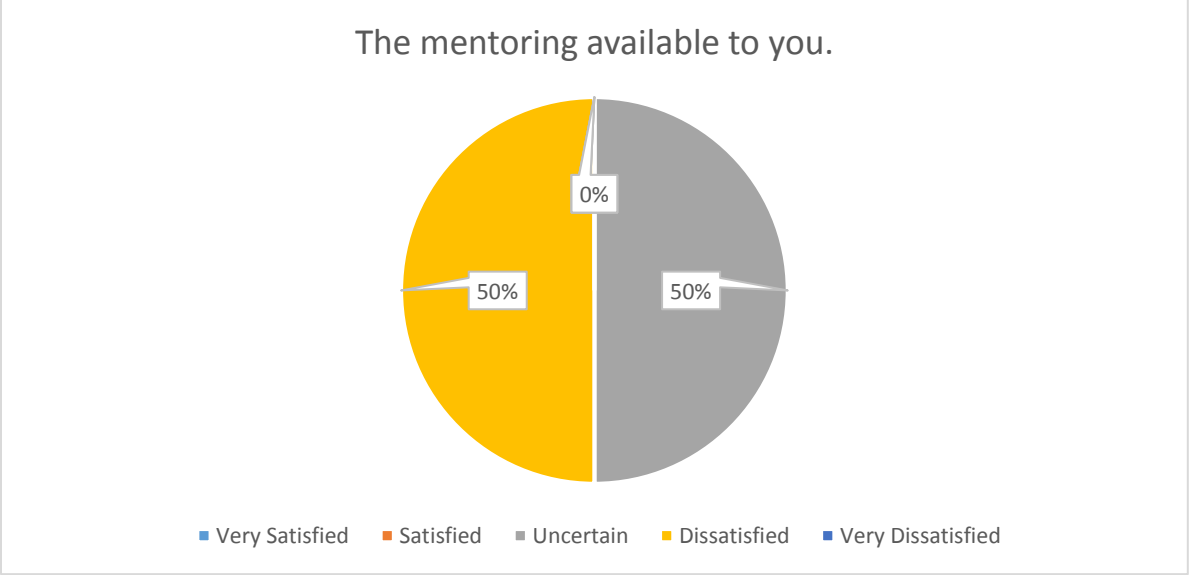


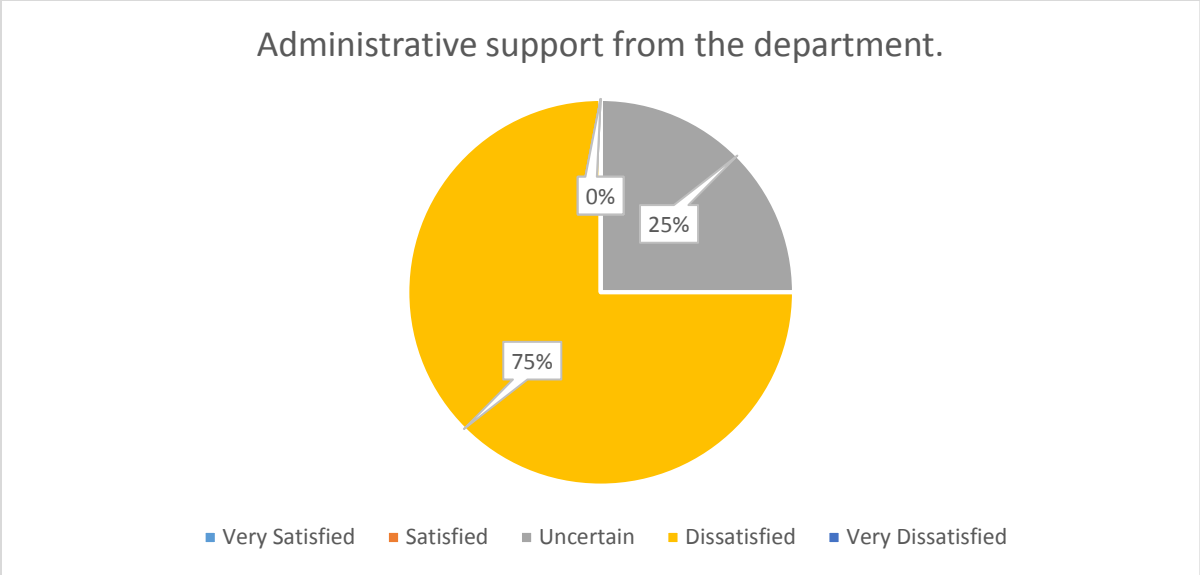


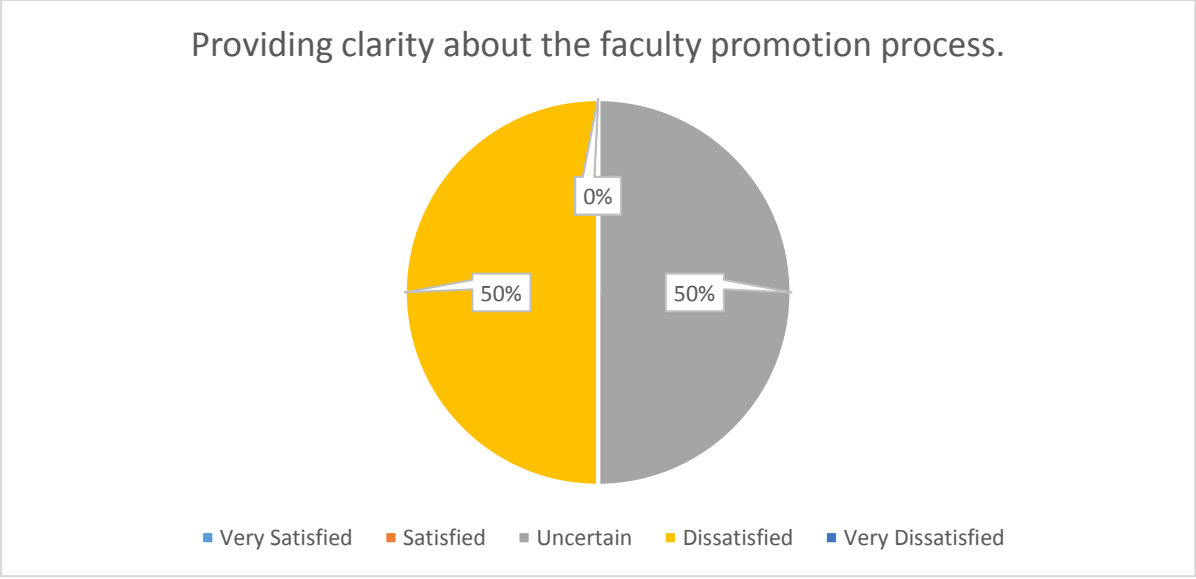

Type of teaching / research you currently do.
25%
25%
25%
25%
Very Satisfied
Satisfied
Uncertain
Dissatisfied
Very Dissatisfied

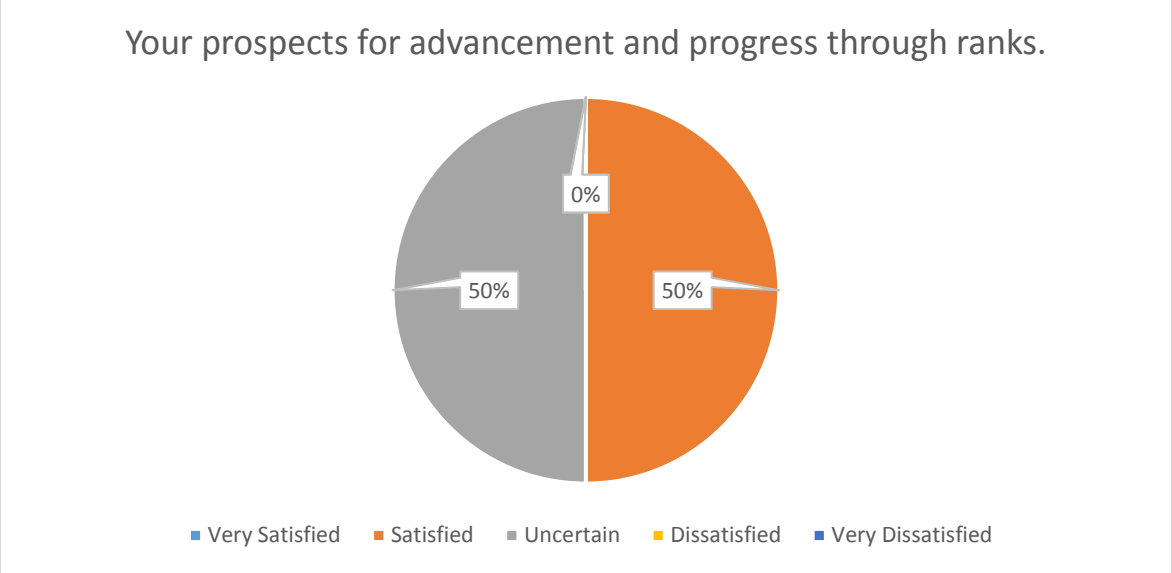

Your interaction with students.
0%
25%
75%
Very Satisfied
Satisfied
Uncertain
Dissatisfied
Very Dissatisfied

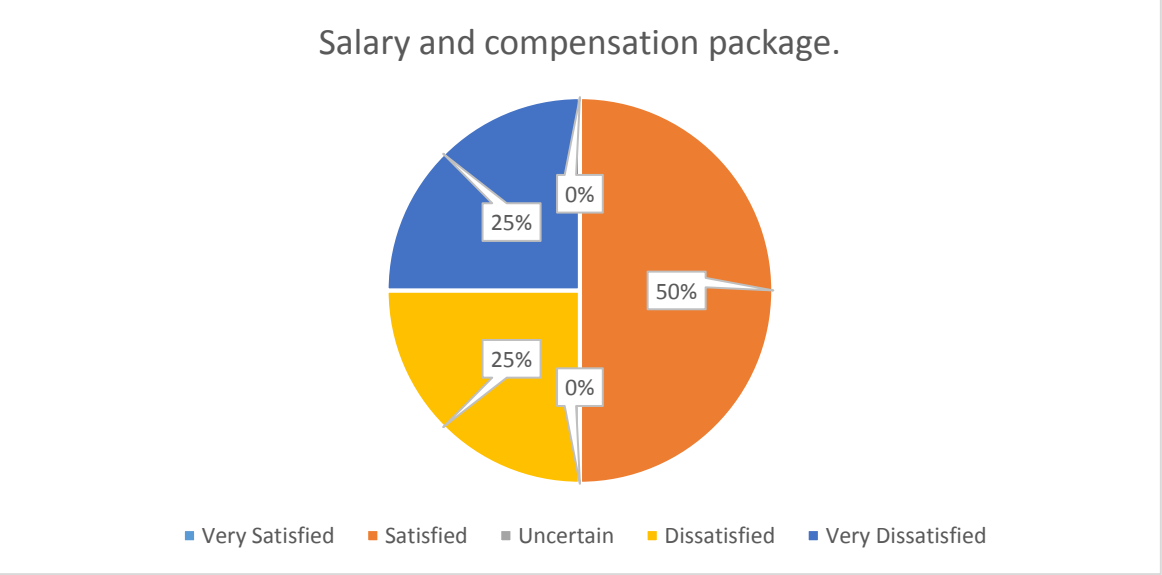

Cooperation you receive from colleagues.
0%
25%
25%
50%
Very Satisfied
Satisfied
Uncertain
Dissatisfied
Very Dissatisfied

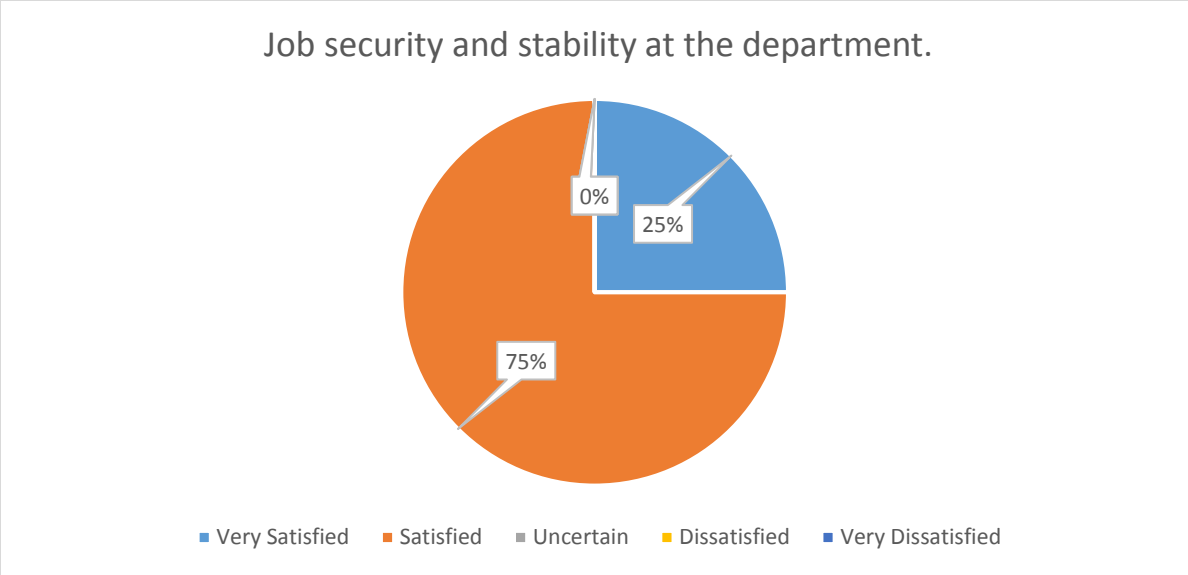

The mentoring available to you.
0%
50%
50%
Very Satisfied
Satisfied
Uncertain
Dissatisfied
Very Dissatisfied

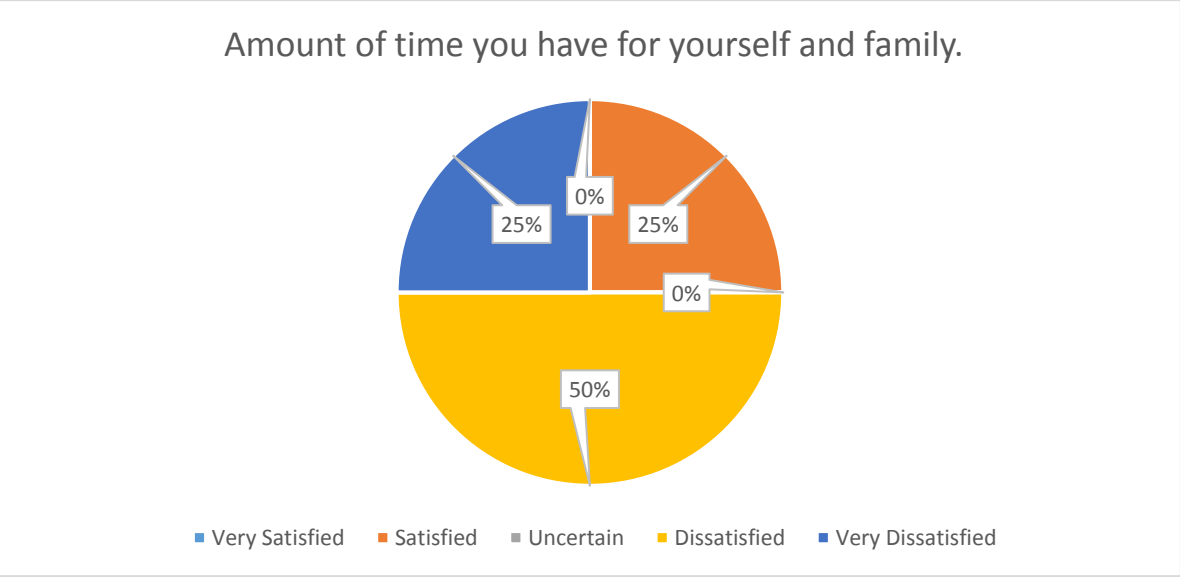

Administrative support from the department.
0%
25%
75%
Very Satisfied
Satisfied
Uncertain
Dissatisfied
Very Dissatisfied

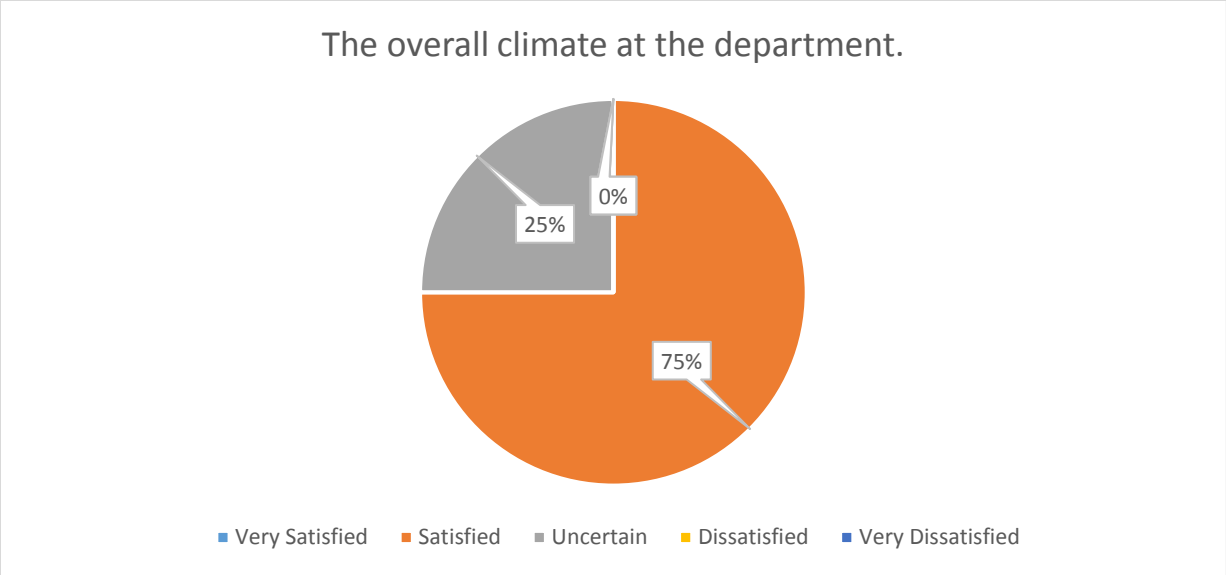

Providing clarity about the faculty promotion process.
0%
50%
50%
Very Satisfied
Satisfied
Uncertain
Dissatisfied
Very Dissatisfied

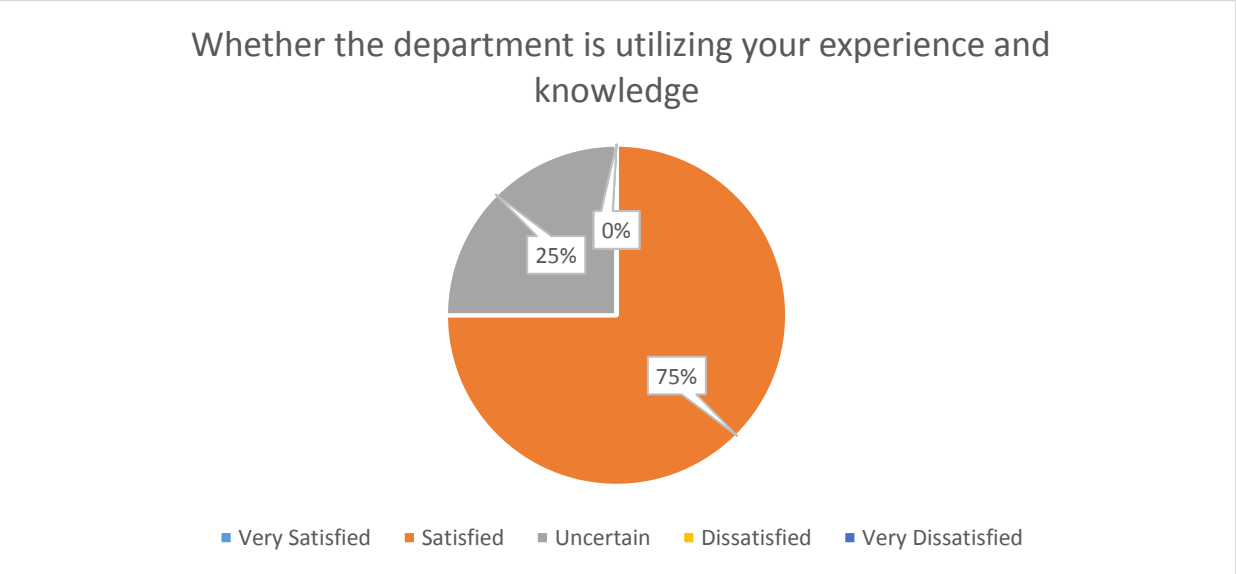

Your prospects for advancement and progress through ranks.
0%
50%
50%
Very Satisfied
Satisfied
Uncertain
Dissatisfied
Very Dissatisfied


Salary and compensation package.
0%
25%
50%
25%
0%
Very Satisfied
Satisfied
Uncertain
Dissatisfied
Very Dissatisfied


Job security and stability at the department.
0%
25%
75%
Very Satisfied
Satisfied
Uncertain
Dissatisfied
Very Dissatisfied


Amount of time you have for yourself and family.
0%
25%
25%
0%
50%
Very Satisfied
Satisfied
Uncertain
Dissatisfied
Very Dissatisfied


The overall climate at the department.
0%
25%
75%
Very Satisfied
Satisfied
Uncertain
Dissatisfied
Very Dissatisfied


Whether the department is utilizing your experience and knowledge
0%
25%
75%
Very Satisfied
Satisfied
Uncertain
Dissatisfied
Very Dissatisfied