Gujrat Institute of Management Sciences

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

Self-Assessment Report

Bachelor of Medical Lab Technology

2022-2024

Prepared By:

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Preface

The Gujrat Institute of Management Sciences (GIMS) located in Gujrat, Punjab, is established with the premise of providing affordable quality education to the youth. As an affiliated institute of Pir Mehr Ali Shah Arid Agriculture University Rawalpindi (PMAS-AAUR) ranked at 8th among all Pakistani Universities and 1001+ among the world universities, GIMS aspires to excel in the field of Management Sciences, Computer Sciences, Economics and Statistics. In order to realize our mission, GIMS is committed to providing quality education through highly qualified and motivated faculty, excellent infrastructure and state-of-the-art facilities. This is a young, innovative, and enterprising business school enroots to compete with the foremost management schools of the country as well as to compete with international business schools. The Institute is dedicated to its unique approach (at least in the region) of providing management education based in cutting-edge research and comprehensive training. Unlike conventional academic institutes, GIMS broadens its educational focus in response to new trends in the developing field of management. Based on the social values of integrity, honesty, professional excellence and a broader vision of life, the Institute aims to provide an educational experience that transform its students into business leaders at par with international managers, executives, and entrepreneurs.

GIMS Vision and Mission

Vision

To become a nationally recognized institute by providing an affordable, high-quality research and sustainable learning environment while propelling the country's economy forward through professionals.

Mission

Gujrat Institute of Management Sciences aims to inspire, prepare and empower students by providing advanced educational experience to foster critical thinking and promote modern technology to transform individuals into competent professionals with compassionate minds and moral values.

Organizational Structure

The Department of the Medical Lab Technology (MLT) is the part of Department of Biosciences whereas; GIMS is one of the affiliated institutes of Arid Agricultural University Rawalpindi. The overall organizational structure is shown in Figure 1.

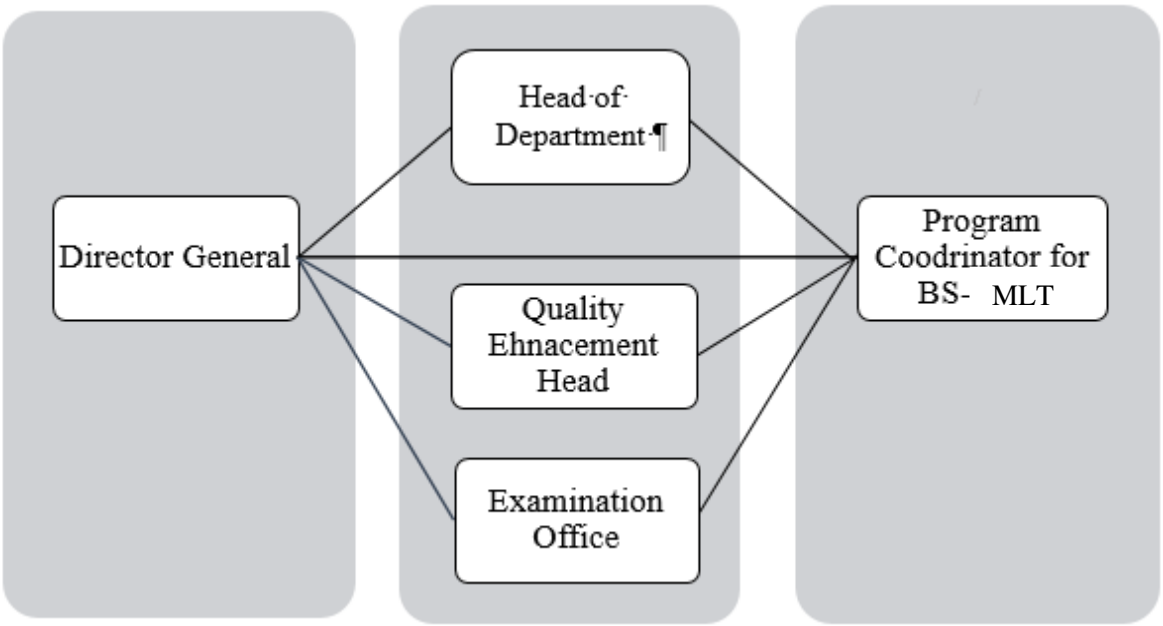

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Figure 1: Organization Overall Flow

Programme Delivery Mode and Location

The Department of Bioscience offers the BS-MLT programme courses during the weekdays between the hours of 08:30 am and 04:30 pm at campus, Gujrat. Courses are generally offered in Fall and Spring semesters. Selected courses are offered during the summer semester. Most of the courses are delivered in the lecture format and there is Lab component is the major core courses. In addition to the lectures, practical laboratory work is also part of many courses, allowing students to perform practical to get on-hand skills for labs problems.

Quality Enhancement Department (QED)

GIMS, as an affiliated institute, believes in high quality of education and has a stringent system of quality management in place. Several layers of quality enhancement are part of this overall system. The authorities and responsibilities of all layers of quality enhancement department are covered in GIMS statues and policies. A Quality Assurance (QA) directorate is functioning at the AAUR level and is responsible for overlooking and ensuring the quality of all programmes offered at GIMS. GIMS has established internal Quality Enhancement Department (QED) in 2015 to carries out periodic audits of degree programmes to ensure that they meet highest standards of quality. The institute Curriculum Review Committee (ICRC) also functions at the institute level and send their reports AAUR respective Department Board of Studies (DBS) are responsible for discussing and finalizing matters regarding a programme's quality, necessary support and data is provided by Academics Branch of the department as well as by the Examination Cell.

CRITERION 1 PROGRAM MISSION OBJECTIVES AND OUTCOMES

Criterion 1 Program Mission Objectives and Outcomes

1.1 BSMLT Program Vision and Mission

BSMLT's Vision

The Medical Lab Technology (MLT) department envisions to equip students with the information, abilities, and professionalism required to handle and process specimens with precision, manage bio-safety processes, and apply fundamental ideas to real-world challenges.

BSMLT's Mission

The BS MLT program's objective is to provide students with a high-quality education in Medical Lab Technology. The curriculum is designed to ensure the knowledge and abilities needed to perform effectively in clinical, research, and public health laboratories. The program will train students to be competent and compassionate laboratory workers capable of meeting the demands of the regional and global healthcare industries through rigorous coursework, hands-on laboratory experience, and exposure to evolving technologies and methodologies.

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

1.2 BSMLT Programme Educational Objective

The medical lab technology program aims at developing the student's intellectual ability, analytical thinking and Practical skills through an appropriate blend of theory and practice. The program assists the students in understanding and developing unique professional qualities required for a changing and dynamic food and public health environment. The four program educational objectives (PEOs), as given below, form the basis of the Department of the BS-MLT at GIMS. Within few years of graduation, the students with bachelor's in medical lab technology are expected to attain the following.

PEO 1: Competence in the entire spectrum of clinical laboratory tests and procedures.

PEO 2: Responsibilities include quality control, clinical decision making, supervision, analysis, and education.

PEO 3: Preventive and corrective maintenance of equipment and devices, or recommend to an appropriate source for repairs.

PEO 4: Professional behavior and interpersonal communication abilities with patients, lab staff, other medical professionals, and the general public.

PEO 5: Provide timely laboratory results to doctors, as well as perform and monitor quality control in the laboratory.

1.2.1 Strategic Plan to Work out the Measurable Objectives

1. To develop and deliver a much broader and up-to-date teaching material that is interactive, understandable and reasonably for the award of the degree.
2. Formulation and consistent revision of curriculum involving core subjects, elective subjects, specialized areas, Technical labs and study tours.
3. The conductance of general and specialized lab-work for achieving competence with food industries, hospital setups experience.
4. We orientate Faculty development programs to affect the learning process of students as well as faculty itself and quality of education.
5. Industry and academia collaborate to introduce our students to the practical implementation of lab technology knowledge in clinical and community setup.

1.3 Consistency of PEOs with Vision and Mission of GIMS, Mission of BSMLT Programme

The PEOs of the BS medical lab and technology are consistent with the vision and mission of GIMS and the mission of BS Program.

Table 1: Consistency of PEOs with Vision and Mission of GIMS, Mission of BSMLT

PEO No	GIMS Vision	GIMS Mission	Programme Mission
1 (Lab Science knowledge and competence)	✓	✓	✓
2 (Interpersonal and Practical competence)	✓	✓	✓

3 (Environment, social, individual and teamwork)	✓	✓	✓
4 (Research and continuous learning)	✓	✓	✓

1.4 Assessment of Programme Educational Objectives (PEOs)

A minimum attainment level for each PEO has been defined along with its method of measurement. The measurement of PEO is carried out using indirect assessment tools. A single PEO has multiple performance indicators. The details of performance indicators and their measurement methods are listed in Annexure A and B. In case, multiple survey questions are attributed to the calculation of a single KPI, equal weightage is given to each question. All KPIs related to a PEO must be attained to achieve the relevant PEO.

Table 2: Assessment of Programme Educational Objectives (PEOs)

Program Educational Objective		How Measured	When to Measured	Key Performance Indicators (KPI)	Improvement Needed
PEO 1	Competence in the entire spectrum of clinical laboratory tests and procedures	Students attainment in different organizations for internships and activities	End of every academic session After 2 years of student during graduation	42% students secured participation in observatory internships in different hotels and hospital setups based on agreement with PEO 1after learning 2 years content.	Job Fairs and guidelines to search and increase students' employment ratio. And internships in different industries and clinical setups
PEO 2	Responsibilities include quality control, clinical decision making, supervision, analysis, and education.	Students performances on different events and activities in university and outdoor	End of every academic session After 1 year of student during	25% or more of the graduates are at middle-level management. 40% or more of the graduates are involved in an internships related to	Periodically arrange the training sessions for students to write CV, report writing, and portfolio

			graduation	core subjects' i-e food processing industries, meal management in hotels, clinical observations in hospital setups.	creating. Department should arrange more training sessions, seminars and study tours
PEO 3	Preventive and corrective maintenance of equipment and devices, or recommend to an appropriate source for repairs.	100% students were involved in public health awareness and nutritional awareness camps.	End of every academic session After 1 year of student graduation	100% students were involved in community and public health nutrition awareness camps and activities. 75% or more employers agreed students are good team players in decision makers in their work field.	Increased project/case studies learning with collaboration With local industries.
PEO 4 & 5	Professional behavior and interpersonal communication abilities with patients, lab staff, other medical professionals, and the general public.	Assessment of student strength securing voulnteerships in different field activities	End of every academic session After 1 year of student graduation	30% or more students performed extracurricular activities related to 2 year course learnings.	.

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

1.5 Review Process of Programme Educational Objectives

Measurement of the defined PEOs will be carried out by indirect assessment methods after 1-2 years of graduation. Current data cannot be assessed as the complete assessment of PEOs will be done after graduation of 4 years duration.

The surveys will be carried out and their results will be compiled by the QED and program's coordinator. An analysis report will be presented by the Director and Director Academics to the review committee comprising Head of Department, Faculty, and QED member and program coordinators. The review committee will recommend improvements/modifications/enhancements (if required) and implementation will be carried out by department. Figure 2 depicts this process in the form of a flow chart.

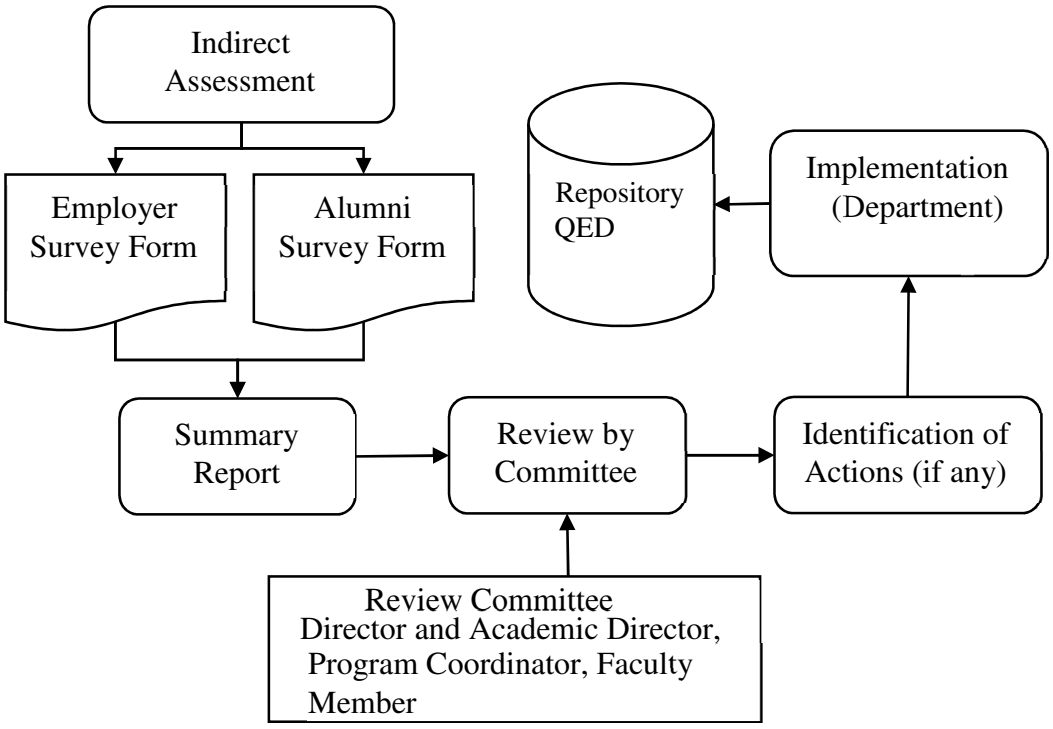

Figure 2: Flowchart of Processes Involved in Establishing and Reviewing PEO

Table 3: Relationship of Program Outcomes and Objectives

Program Objectives	Program Outcomes				
	1	2	3	4	5
1	+++	+++	+++	+++	+++
2	++	++	++	+	++
3	++	++	++	+++	+++
4	+++	++	+++	+++	+++

Rating Scale

+ = Moderately Satisfactory

++= Satisfactory

+++= Highly Satisfactory

1.5.1 Graduating Survey

The coordinator of the programme surveys graduates on the caliber of the programme. The department also conducts a survey to get input from graduates on the suitability of the curriculum.

The department of Medical Lab and Technology is currently unable to conduct the graduation survey as the first session will be accomplished in 2026.

1.5.2 Alumni Survey

A retrospective evaluation of the university experience is provided by the Alumni Survey. It is intended to elicit feedback from alumni in order to analyze outcomes across a number of aspects.

The department of sciences is kept up to date on the whereabouts, activities and events of whole duration and will compile it at the end of session 2022-2026 of alumni through an alumni survey, hence Alumni survey is not implementable in current year.

1.5.3 Employer Survey

The program's coordinator conducts a survey of employers about the quality of the GIMS graduates and their performance in field, but this criterion cannot be fulfilled right now as there is no passing batch of medical lab technology.

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

1.5.4 Strength of the Programme

- Qualified faculty
- HOD helpful and address the student's problem on time
- Introduction to the new lab techniques and medical centers
- Much focus on the theoretical concepts and practical approach which help to continue further studies.
- The Programme enables students to understand the global health and nutritional problems and their practical solutions.
- Graduates will be able to get opportunities in society as a lab technologist and lab supervisor in university lab, clinic and hospital

1.5.5 Weakness of the Programme

- Less number of regular faculty members
- More lab time should be provided which should be independent of the time table so that students can work what work they want to do.
- Lack of practice in the hospitals due to busy schedule.
- Lack of awareness about profession and its importance for consultation.
- Social media quacks and mishandling of opportunities effects students.
- Compromised Study literature and Laboratory facilities access to institute.

1.5.6 Opportunities of the Programme

The knowledge in this field will be helpful to train manpower in the area of lab technology to apply it in order to promote accurate diagnose in Pakistani Population. As a MLT trained man force will work

with people to help them to be aware about health status, offering practical advice to enable them to make best diagnose.

1.5.7 Future Development of Programme

Table 4: Features of Development

Sr. No	Observations	Action Take by Department	Status
1	Students' advisors appointment for each batch of the program.	The department is looking for full time teachers to assign the program advisors to each batch.	In process
2	The Labs updates for smooth exaction of courses.	To update the labs and processing speed of current system , department has installed the latest equipment for nutrition profiling and practicals performances	Done
3	The department is affiliated with professional hospitals and laboratories where students can get assistance as needed and perform their practical's and rotations	We are working on, currently department has engaged two local multidisciplinary hospitals with established laboratries ,Gujrat hospital and Rasool medical center, wahdat trust for students practical performances and visits .	Partially Achieved
4	The department is working on establishing full time students internships and final year practices framework and implementation plans	Department of sciences is fully involve with an established team to devolpe further plans and stratigies for MLT programme ,interships and final year evaluations,selection criterians and training manuals framework	In process

		which will be provided in next SAR	

1.6 Define and Publish Programme Learning Outcomes

Five PLOs have been defined for the bachelor's in medical lab technology by keeping in mind the PEOs of the programme.

1.6.1 Programme Learning Outcomes

At the successful completion of BS-MLT degree, the students will be equipped with the following.

1. Ability to understand and execute laboratory tests, procedures, and analyses while operating medical laboratory equipment's.
2. Becoming acquainted with human physiology, anatomy, hematology, phlebotomy, endocrinology, medical genetics, biochemistry etc.
3. The ability to assess laboratory results, discovers problems, and troubleshoots in order to ensure quality control and quality assurance.
4. Effective communication and collaboration on test data and findings with healthcare professionals and teams.
5. Preparation for professions in medical laboratory technology, research, education, healthcare management, and quality assurance.

1.7 Process of Data Gathering and Results of Assessment of PLOs

PLOs of the BS-MLT are evaluated for two purposes.

1. Each student has to pass all five PLOs during the four-year degree programme. This requirement is in addition to the GPA requirements of the programme. This assessment is referred to as Student PLO assessment.
2. Each PLO is also assessed to ensure the quality of the BS-MLT programme. This assessment is referred to as Programme PLO assessment.

1.7.1 Direct Assessment

Direct assessment of PLOs is carried out from the assessment of CLOs pertaining to a particular PLO.

1.7.2 Indirect Assessment

Indirect assessment is carried out using graduating student survey, which is collected at the time of the graduation. The graduating student survey results are only used in Programme PLO assessments. KPIs for student and programme PLO assessment are given in Table, which is not available because of incompletion of current session.

Table 5: KPIs for PLO Assessment

Programme Learning Outcomes 1 to 5	**Measurement Tool**	**Key Performance Indicator**	**Measurement time**
Programme PLO assessment	Indirect (not available)	(not available)	At the time of graduation (not available)
	Attainment via course assessments (clos, class projects, tests, activities)	80% of every cohort attains at least 65% in each PLO	At the end of each academic year and semester
Student PLO assessment :2	Attainment via course assessments, projects, assignments, etc. *(Direct)*	At least obtain 64% in each PLO upon completion of 2 years during graduation.	At the end of each Semester

1.8 Application of Assessment Results to Develop and Improve the Programme Learning Objectives

1.8.1 Results of PLO Attainment Obtained Through Direct Assessment

1.8.1.1 PLO 1: Ability to understand and execute laboratory tests, procedures, and analyses while operating medical laboratory equipment's.

PLO 1: Be Competent in Theoretical and practical implementation of techniques in lab tests, procedures, and analyses	
Assessment Method	**Minimum Level of Achievement**
Attainment via direct assessments	80% of the students attain at least 90% of marks.
Graduating student survey	Not available

Table 6: Courses in Which Student Performance on PLO 1 is Assessed

S No	Semester No.	Course Code	Course Title
1	4	MLT-405	Fundamentals of Enzymology
3	2	MLT-306	Quality assurance and lab management tools

Table 7: Summary of Assessment Results for PLO1.

S No	Cohort	Fall 2022 (%age attainment)	Spring 2023(%age attainment)	Fall 2023(%age attainment)	Spring 2024(%age attainment)	Overall Average (%age attainment)
1	MLT-405			-	98	98
3	MLT-		100	-	99	100

	306					

1.8.2 PLO 2: Becoming acquainted with human physiology, anatomy, hematology, phlebotomy, clinical pathology, molecular biology, biochemistry etc.

PLO 2: Understand the theoretical and practical implementation of techniques in fundamentals and basic lab knowledge.	
Assessment Method	**Minimum Level of Achievement**
Attainment via direct assessments	100% of the students attain at least 90%of marks
Graduating student survey	Not available

Table 8: Courses in Which Student Performance on PLO2 is Assessed

S No	Semester No.	Course Code	Course Title
1	2	MLT-307	Anatomy and Physiology-I
2	4	MLT-407	Hematology-1
3	4	MLT-408	Molecular biology
4	2	MLT-304	Biochemistry-II

Table 9: Summary of Assessment Results for PLO 2

S No	Cohort	Fall 2022 (%age attainment)	Spring 2023 (%age attainment)	Fall 2023 (%age attainment)	Spring2024(%age Attainment)	Overall Average (%age attainment
1	MLT-307		100		99	100
2	MLT-407		-	-	98	98
3	MLT-	-	-	-	98	98

	408					
4	MLT-304		100		99	100

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

1.8.3 Admission Response and Percentage Admitted

Student's response towards medical lab technology at GIMS has been encouraging as can be seen from the final merit list is given in Table 9.

Table 10: Student Admissions and Enrolments

Sr. No.	Intake Batch	Total Admissions offered	Total Students Admitted	Present Strength	No. of Section(s)
1	Fall 2022	50	26	24	2
2	Fall 2023	50	22	21	1

1.8.4 Intake

The student intake for the medical lab technology shown in Table 10.

Table 11: Student Intake for Enrolled in BS-MLT in last 2 year

Year	2022-2023	2023-2024
Students	24	45

1.9 Alumni Survey

A survey has not been conducted. The first batch of BS-MLT, GIMS will be completed in 2026.

1.10 Teacher and Course Assessment

1.10.1 Teacher Evaluation

At the end of every semester teacher evaluation is conducted from the students to assess the teacher/ instructor performance and instructor attitude towards the student and classroom learning from students' perspective. Some of the teacher evaluation results are presented here. The results of teacher evaluation are shared with teacher and get feedback from teachers. In some case where QED and Department found unusual result and significant comment that shows the teacher and student had serious conflict regarding the fair assessment, classroom learning and teacher attitude towards students. QED had meeting with concerned teacher to address the issues.

1.10.2 Course Evaluation

At the end of every semester course evaluation is conducted from the students to assess the learning outcomes of course. Some of the course evaluation results are presented here. The results of course evaluations were shared with teacher and get feedback from teachers. The results of course evaluations help to identify how much the course learning objectives were achieved.

Instructor Name: Ms. Zartash Zahra

Course: MLT-303 Biochemistry-II

The student shows the positive response towards instructor which showcase the student's satisfaction towards teacher. The 25% students were agreed instructor was prepared for class. The survey results indicate that the instructor has completed whole course and also provide the additional material apart from the course textbook. The 75% and 88% were strongly agreed and agreed respectively that instructor was available during the specified office hours and for after class consultations.

Description	S.A	A	UC	D	S.D
The Instructor is prepared for each class.	75%	25%	0%	0%	0%
The Instructor demonstrates knowledge of the subject.	88%	13%	0%	0%	0%
The Instructor has completed the whole course.	88%	13%	0%	0%	0%
The Instructor provides additional material apart from the textbook.	75%	25%	0%	0%	0%
The Instructor gives citations regarding current situations with reference to Pakistani context.	75%	25%	0%	0%	0%
The Instructor communicates the subject matter effectively.	88%	13%	0%	0%	0%
The Instructor shows respect towards students and encourages class participation	75%	25%	0%	0%	0%
The Instructor maintains an environment that is conducive to learning.	75%	25%	0%	0%	0%
The Instructor arrives on time.	75%	25%	0%	0%	0%
The Instructor leaves on time.	88%	13%	0%	0%	0%
The instructor has completed all classes regularly.	75%	25%	0%	0%	0%
The instructor posts the assignments/quizzes on time and give reasonable time to complete the assigned assignments/quizzes.	75%	25%	0%	0%	0%
The Subject matter presented in the course has increased your knowledge of the subject.	75%	25%	0%	0%	0%
The Instructor was available during the specified hours on office and after class for consultations.	75%	25%	0%	0%	0%
The course integrates theoretical course concepts with real-world applications.	88%	13%	0%	0%	0%
The assignments and exams covered the materials presented in the course.	88%	13%	0%	0%	0%
The course material is modern and updated	75%	25%	0%	0%	0%
The teacher is fair in exams.	88%	13%	0%	0%	0%

Instructor Name: Mr. Dr Habib Ur Rehman

Course: MLT-305 Anatomy and Embryology

The student shows the positive response towards instructor which showcases the student's satisfaction towards teacher. The 75% students were strongly agreed instructor was prepared for class. The survey results indicate that the instructor communicates the subject matter effectively.

Description	S.A	A	UC	D	S.D
The Instructor is prepared for each class.	63%	38%	0%	0%	0%
The Instructor demonstrates knowledge of the subject.	75%	25%	0%	0%	0%
The Instructor has completed the whole course.	75%	25%	0%	0%	0%
The Instructor provides additional material apart from the textbook.	75%	25%	0%	0%	0%
The Instructor gives citations regarding current situations with reference to Pakistani context.	63%	38%	0%	0%	0%
The Instructor communicates the subject matter effectively.	75%	25%	0%	0%	0%
The Instructor shows respect towards students and encourages class participation	63%	38%	0%	0%	0%
The Instructor maintains an environment that is conducive to learning.	75%	25%	0%	0%	0%
The Instructor arrives on time.	75%	25%	0%	0%	0%
The Instructor leaves on time.	75%	25%	0%	0%	0%
The instructor has completed all classes regularly.	63%	38%	0%	0%	0%
The instructor posts the assignments/quizzes on time and give reasonable time to complete the assigned assignments/quizzes.	75%	25%	0%	0%	0%
The Subject matter presented in the course has increased your knowledge of the subject.	63%	38%	0%	0%	0%
The Instructor was available during the specified hours on office and after class for consultations.	75%	25%	0%	0%	0%
The course integrates theoretical course concepts with real-world applications.	63%	38%	0%	0%	0%
The assignments and exams covered the materials presented in the course.	63%	38%	0%	0%	0%
The course material is modern and updated	63%	38%	0%	0%	0%
The teacher is fair in exams.	75%	25%	0%	0%	0%

Instructor Name: Mr Usman Adress

Course: MLT-304 Quality assurance and Lab Management Tools

The majority of student shows the positive response towards instructor which showcase the student's satisfaction towards teacher. However, a small ratio of students was uncertain and disagrees. The survey results indicate that the instructor communicates the subject matter effectively. The 70% and 20% were strongly agreed and agreed respectively that the assignments and exams covered the materials presented in the course.

Description	S.A	A	UC	D	S.D
The Instructor is prepared for each class.	60%	40%	0%	0%	0%
The Instructor demonstrates knowledge of the subject.	70%	30%	0%	0%	0%
The Instructor has completed the whole course.	60%	40%	0%	0%	0%
The Instructor provides additional material apart from the textbook.	60%	30%	0%	10%	0%
The Instructor gives citations regarding current situations with reference to Pakistani context.	60%	30%	0%	10%	0%
The Instructor communicates the subject matter effectively.	60%	40%	0%	0%	0%
The Instructor shows respect towards students and encourages class participation	60%	40%	0%	0%	0%
The Instructor maintains an environment that is conducive to learning.	50%	40%	0%	10%	0%
The Instructor arrives on time.	70%	30%	0%	0%	0%
The Instructor leaves on time.	60%	40%	0%	0%	0%
The instructor has completed all classes regularly.	70%	30%	0%	0%	0%
The instructor posts the assignments/quizzes on time and give reasonable time to complete the assigned assignments/quizzes.	60%	30%	0%	10%	0%
The Subject matter presented in the course has increased your knowledge of the subject.	70%	20%	10%	0%	0%
The Instructor was available during the specified hours on office and after class for consultations.	70%	30%	0%	0%	0%
The course integrates theoretical course concepts with real-world applications.	70%	30%	0%	0%	0%
The assignments and exams covered the materials presented in the course.	70%	20%	0%	10%	0%
The course material is modern and updated	60%	40%	0%	0%	0%
The teacher is fair in exams.	70%	20%	10%	0%	0%

Instructor Name: Aleena Javed
Course: HND-304 Human Physiology-I

The student shows the positive response towards instructor which showcase the student's satisfaction towards teacher. The 92% students were agreed instructor was prepared for class. The survey results indicate that the instructor has completed whole course and also provide the additional material apart from the course textbook. The 96% and 4% were strongly agreed and agreed respectively that instructor was available during the specified office hours and for after class consultations.

Description	S.A	A	UC	D	S.D
The Instructor is prepared for each class.	88%	13%	0%	0%	0%
The Instructor demonstrates knowledge of the subject.	75%	25%	0%	0%	0%
The Instructor has completed the whole course.	88%	13%	0%	0%	0%
The Instructor provides additional material apart from the textbook.	88%	13%	0%	0%	0%
The Instructor gives citations regarding current situations with reference to Pakistani context.	75%	25%	0%	0%	0%
The Instructor communicates the subject matter effectively.	75%	25%	0%	0%	0%
The Instructor shows respect towards students and encourages class participation	75%	25%	0%	0%	0%
The Instructor maintains an environment that is conducive to learning.	88%	13%	0%	0%	0%
The Instructor arrives on time.	88%	13%	0%	0%	0%
The Instructor leaves on time.	75%	25%	0%	0%	0%
The instructor has completed all classes regularly.	88%	13%	0%	0%	0%
The instructor posts the assignments/quizzes on time and give reasonable time to complete the assigned assignments/quizzes.	88%	13%	0%	0%	0%
The Subject matter presented in the course has increased your knowledge of the subject.	75%	25%	0%	0%	0%
The Instructor was available during the specified hours on office and after class for consultations.	88%	13%	0%	0%	0%
The course integrates theoretical course concepts with real-world applications.	63%	38%	0%	0%	0%
The assignments and exams covered the materials presented in the course.	88%	13%	0%	0%	0%
The course material is modern and updated	88%	13%	0%	0%	0%
The teacher is fair in exams.	75%	25%	0%	0%	0%

Instructor Name: Dr Habib Ur Rehaman
Course: MLT-307 Anatomy & Physiology-II

The course evaluation results are satisfactory, and it's indicating that the students were clear about the course objectives and outcomes. All students in class were agreed the course was well organized and workload was manageable. High proportion of students agreed that course stimulated their interest. Results also indicate the students were motivated to participate in class to achieve the learning outcomes.

Description	S.A	A	UC	D	S.D
The Instructor is prepared for each class.	90%	10%	0%	0%	0%
The Instructor demonstrates knowledge of the subject.	90%	10%	0%	0%	0%
The Instructor has completed the whole course.	90%	10%	0%	0%	0%
The Instructor provides additional material apart from the textbook.	90%	10%	0%	0%	0%
The Instructor gives citations regarding current situations with reference to Pakistani context.	90%	10%	0%	0%	0%
The Instructor communicates the subject matter effectively.	90%	10%	0%	0%	0%
The Instructor shows respect towards students and encourages class participation	90%	10%	0%	0%	0%
The Instructor maintains an environment that is conducive to learning.	80%	20%	0%	0%	0%
The Instructor arrives on time.	90%	10%	0%	0%	0%
The Instructor leaves on time.	90%	10%	0%	0%	0%
The instructor has completed all classes regularly.	90%	10%	0%	0%	0%
The instructor posts the assignments/quizzes on time and give reasonable time to complete the assigned assignments/quizzes.	90%	10%	0%	0%	0%
The Subject matter presented in the course has increased your knowledge of the subject.	90%	10%	0%	0%	0%
The Instructor was available during the specified hours on office and after class for consultations.	80%	10%	0%	0%	10%
The course integrates theoretical course concepts with real-world applications.	90%	10%	0%	0%	0%
The assignments and exams covered the materials presented in the course.	90%	10%	0%	0%	0%
The course material is modern and updated	90%	10%	0%	0%	0%
The teacher is fair in exams.	90%	10%	0%	0%	0%

1.11 Using Obtained Results to Improve Programme Effectiveness

1.11.1 Performance Indicators for PEOs

A minimum attainment level for each PEO has been defined along with its method of measurement. The measurement of PEO is carried out using indirect assessment tools. A single PEO has multiple performance indicators. The details of performance indicators and their measurement methods are listed in Annexure A and B. In case, multiple survey questions are attributed to the calculation of a single KPI, equal weightage is given to each question. All KPIs related to a PEO must be attained to achieve the relevant PEO.

CRITERION 2 CURRICULUM DESIGN AND ORGANIZATION

Criterion 2 Curriculum Design and Organization

2.1 The curriculum of the Medical Lab Technology program is developed keeping in view the guidelines provided by HEC.

2.1.1 Consistency of Programme Structure and Course Contents in Development of Intellectual and Practical Skills and Attainment of PLOs

The Medical Lab Technology programme curriculum is designed to fulfil the programme learning outcomes and course learning outcomes. Each semester is of approximately 16-week duration. The Bachelor of Medical Lab Technology programme's minimum duration is four years and maximum 10 semesters two for clinical internship. The course requirements for BS Medical Lab Technology are 124 credit hours. A fulltime student is required to take courses not less than 15 credit hours of courses offered in respective semester.

2.2 Curriculum Design

The curriculum of the BS Medical Lab Technology programme was devised based on the needs of all stakeholders. The curriculum is broadly divided in clinical and non-clinical courses. The medical lab domain includes fundamental courses of medical and clinical labs including core and elective courses. A comprehensive final year internship is also part of the curriculum. A number of courses include complex clinical lab courses that allow the students to apply their knowledge and critical thinking and gain an in depth understanding of theory. The elective domain contains courses that are related to humanities, microbiology and medical biochemistry. These courses develop skills of pre-clinical and laboratory skills & management, team work, communication, ethical and moral responsibilities and sustainable development. The mix of clinical and non-clinical courses is in accordance with the national guidelines provided by the HEC.

Summary of the curriculum of BS Medical Lab Technology programme is given in Table 12.

Table 12: Curriculum Course Requirements

Domain	Knowledge Area	HEC Guidelines		BS Human Nutrition and Dietetics Program	
		Total Credits	Overall %	Total Credits	Overall %
Compulsory courses	General Education courses	30	29.03%	36	29.03%
	Internships /project	06			
	Sub Total	36			
Core Science Courses	MLT core courses	76	70.96%	88	70.96%
	Interdisciplinary courses	12			
	Sub Total	88			
Total		**124**	**100**	**124**	**100**

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

2.3 Mapping of Courses to PLOs

Programme Semester-wise mapping of courses to PLOs is given in Table 13. The course to PLO mapping is only shown for the courses that are used for assessing a particular PLO.

Table 13: Mapping of Semester-wise Courses to Program Learning Objectives

Semester No	Course Code	Course Title	Ability to understand and execute laboratory tests and procedures	Becoming acquainted with different allied clinical courses	The ability to assess laboratory results to ensure quality control and assurance.	Effective communication on test data and findings	Preparation regarding professions in MLT research and health care. systems
			1	2	3	4	5
1	MLT-301	Biochemistry-I	✓				
	MLT-303	Phlebotomy	✓	✓			
	MIC-311	General Microbiology	✓	✓	✓		

	ZOO L-313	Human Physiology		✓			
2	MLT-302	Biochemistry-II	✓	✓			
	MLT-304	Clinical Hematology	✓	✓	✓		
	MLT-306	Anatomy and Embryology	✓		✓		
3	MLT-401	Clinical Biochemistry	✓	✓		✓	
	MLT-403	Biosecurity and Risk Management	✓	✓	✓		
	MLT-405	Laboratory Instrumentation and Techniques	✓		✓		✓
	BCH-302	Molecular Biology	✓	✓			
4	MLT-402	Endocrinology	✓	✓			
	MLT-404	Clinical Pathology	✓	✓	✓	✓	
	MLT-406	Public Health and Epidemiology			✓	✓	✓
	MLT-408	Quality Assurance and Laboratory Management Tools	✓		✓		✓
5	MLT-501	Medical Genetics		✓	✓	✓	
	MLT-503	Blood Banking and Transfusion Medicine	✓		✓		✓
	MLT -505	Clinical Parasitology and Bacteriology	✓	✓	✓		
	MLT -507	Biosafety and Bioethics	✓		✓		
	MLT -509	Research Planning and Report Writing				✓	✓
	BCH -405	Bioinformatics		✓		✓	✓
	BIOT -301	Introduction to Biotechnology	✓	✓			✓
6	MLT -502	Introduction to Forensic Sciences	✓		✓	✓	
	MLT -504	Molecular Diagnostic Techniques	✓	✓			
	MLT -506	Cytology and Histology Techniques	✓	✓	✓		
	MLT -508	Fundamentals of Infection Control	✓		✓	✓	✓

	MLT -510	Clinical Virology and Mycology	✓	✓	✓		
	MLT -512	General Pharmacology	✓		✓	✓	
	MLT -514	Immunology and Serology	✓	✓			
7	MLT -601	Clinical Rotation A (Histopathology and Hematology)	✓		✓		✓
	MLT -603	Clinical Rotation B (Clinical Chemistry)	✓		✓		✓
	MLT -605	Clinical Rotation C (Microbiology)	✓		✓		✓
	MLT -607	Clinical Rotation D (Molecular Biology)	✓		✓		✓
	MLT -609	Clinical Lab Rotation E (Blood Bank)	✓		✓		✓
	MLT -620	Seminar		✓	✓	✓	✓
8	MLT -299	Internship/Field Experience	✓	✓	✓	✓	✓
	MLT -399	Capstone Project	✓	✓	✓	✓	✓

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

The table below shows the categorization of courses which play vital role in building theoretical background, problem analysis and designing a solution.

Table 14: Detail of Courses Representing the Theoretical Background, Problem Analysis and Solution Design.

Element	Course Code	Course Title
	MLT-301	Biochemistry-I
	MLT-303	Phlebotomy
	MLT-302	Biochemistry-II
	MLT-304	Clinical Hematology
	MLT-306	Anatomy and Embryology
	MLT-401	Clinical Biochemistry
	MLT-403	Biosecurity and Risk Management

Core Courses	MLT-405	Laboratory Instrumentation and Techniques
	MLT-402	Endocrinology
	MLT-404	Clinical Pathology
	MLT-406	Public Health and Epidemiology
	MLT-408	Quality Assurance and Laboratory Management Tools
	MLT-501	Medical Genetics
	MLT-503	Blood Banking and Transfusion Medicine
	MLT-505	Clinical Parasitology and Bacteriology
	MLT-507	Biosafety and Bioethics
	MLT-509	Research Planning and Report Writing
	MLT-502	Introduction to Forensic Sciences
	MLT-504	Molecular Diagnostic Techniques
	MLT-506	Cytology and Histology Techniques
	MLT-508	Fundamentals of Infection Control
	MLT-510	Clinical Virology and Mycology
	MLT-512	General Pharmacology
	MLT-514	Immunology and Serology
	MLT-601	Clinical Rotation A (Histopathology and Hematology)
	MLT-603	Clinical Rotation B (Clinical Chemistry)
	MLT-605	Clinical Rotation C (Microbiology)
	MLT-607	Clinical Rotation D (Molecular Biology)
	MLT-609	Clinical Lab Rotation E (Blood Bank)
	MLT-620	Seminar
Compulsory Courses	SOS-301	Moral Foundation of Education
	ZOOL-313	Human Physiology
	SOC-301	Introduction to Sociology
	ENG-301	Functional English

	ENG-302	Expository Writing
	QR-401	Quantitative Reasoning-I
	QR-402	Quantitative Reasoning-II
	IS-302	Islamic Studies and Ethics
	SSH-302	Ideology and Constitution of Pakistan
	CSC-100	Applications of Information and Communication Technologies (ICT)
	SSH-304	Entrepreneurship
	SCS-302	Civic and Community Engagement

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

The degree of BS (MLT) comprises of sufficient courses that covers Medical Lab and Technology needs. Courses such as Clinical Hematology, Clinical Pathology, Phlebotamy, Molecular Diagnostics, Introduction to Forensic Sciences, Fundamentals of Enzymology, Human Physiology, Biochemistry etc. provide Medical Lab Technology theoretical knowledge to the graduates.

Standard 2-4: The curriculum must satisfy the major requirements for the program as specified by the accreditation body

The curriculum has number of courses to fulfil a minimum number of credit hours' requirements (15 credit hours) under the category of major courses.

Standard 2-5: The curriculum must satisfy general education, arts, professional and other discipline requirements of program.

In general education category the designed curriculum offers number of courses to meet the requirement of 15 credit hours under sated category

Table 15: Courses Categories (Core, General, Major, Supporting) and their Accumulated Credit Hours

Category	Credit Hours	Accumulated Credit Hours
Medical Lab Technology Major-Core Courses	**76**	
Medical Lab Technology-Core supporting Courses(Inter Disciplinary Courses)	**12**	

Medical Lab Technology General Courses	**30**	**124**
Internship/Field Experience	**03**	
Capstone Research Project	**03**	
Total Credit Hours		**124**

Standard 2-6: The information technology component of the curriculum must be integrated throughout the degree program.

To enhance the general Medical Lab Technology knowledge and basic skills the curriculum included three courses of 9 credit hours,

Standard 2-7: Oral and written communication skills of the student must be developed and applied in a program.

To enhance the communication skills of students, GIMS has included several general education courses as per HEC criterion.

Table 16: General Education Course

Course Code	Course Title	Credit Hours
ENG-301	Functional English	3(3-0)
ENG-302	Expository Writing	3(3-0)

2.4 Course Offerings

The offered courses belong to various domains of knowledge. The details of offered courses are provided in Table 17

Table 17: Course Offering

Sem No.	Sr. No.	Course Code	Course Title	Credit Hours	Knowledge Area	Pre-requisite Courses
1	1	MLT-301	Biochemistry-I	3(2-2)	MLT-301	Nil
	2	MLT-303	Phlebotomy	3(2-2)	MLT-303	Nil
	3	MIC-311	General Microbiology	3(2-2)	MIC-311	Nil
	4	ZOOL-313	Human Physiology	3(2-2)	ZOOL-313	Nil

	5	ENG-301	Functional English	3(3-0)	ENG-301	Nil
	6	QR-401	Quantitative Reasoning-I	3(3-0)	QR-401	Nil
	7	TOQ-301	Translation of Quran (Audit Course)	1(1-0)	TOQ-301	Nil
			Total Credit Hours	**19(15-8)**		
Sem No.	**Sr. No.**	**Course Code**	**Course Title**	**Credit Hours**	**Knowledge Area**	**Pre-requisite Courses**
2	1	MLT-302	Biochemistry-II	3(2-2)	MLT-302	Nil
	2	MLT-304	Clinical Hematology	2(2-0)	MLT-304	Nil
	3	MLT-306	Anatomy and Embryology	3(2-2)	MLT-306	Nil
	4	SCS-302	Civic and Community Engagement	2(2-0)	SCS-302	Nil
	5	CSC-100	Applications of Information and Communication Technologies (ICT)	3(2-2)	CSC-100	Nil
	6	IS-302	Islamic Studies and Ethics	2(2-0)	IS-302	Nil
	7	TOQ-401	Translation of Quran (Audit Course)	1(1-0)	TOQ-401	Nil
			Total Credit Hours	**16(13-6)**		
Sem No.	**Sr. No.**	**Course Code**	**Course Title**	**Credit Hours**	**Knowledge Area**	**Pre-requisite Courses**
3	1	MLT-401	Clinical Biochemistry	3(2-2)	MLT-401	Nil
	2	MLT-403	Biosecurity and Risk Management	2(2-0)	MLT-403	Nil
	3	MLT-405	Laboratory Instrumentation and Techniques	2(2-0)	MLT-405	Nil

	4	BCH-302	Molecular Biology	3(2-2)	BCH-302	Nil
	5	QR-402	Quantitative Reasoning-II	3(3-0)	QR-402	Nil
	6	SSH-302	Ideology and Constitution of Pakistan	2(2-0)	SSH-302	Nil
	7	SOS-301	Moral Foundation of Education	2(2-0)	SOS-301	Nill
	8	TOQ-501	Translation of Quran (Audit Course)	1(1-0)	TOQ-501	
			Total Credit Hours	**18(16-4)**		
Sem No.	**Sr. No.**	**Course Code**	**Course Title**	**Credit Hours**	**Knowledge Area**	**Pre-requisite Courses**
4	1	MLT-402	Endocrinology	2(2-0)	MLT-402	Nil
	2	MLT-404	Clinical Pathology	2 (2-0)	MLT-404	Nil
	3	MLT-406	Public Health and Epidemiology	3(3-0)	MLT-406	Nil
	4	MLT-408	Quality Assurance and Laboratory Management Tools	3(2-2)	MLT-408	Nil
	5	SOC-301	Introduction to Sociology	2(2-0)	SOC-301	Nil
	6	ENG-302	Expository Writing	3(3-0)	ENG-302	Nil
	7	SSH-304	Entrepreneurship	2(2-0)	SSH-304	Nil
	8	TOQ-601	Translation of Quran (Audit Course)	1(1-0)	TOQ-601	
			Total Credit Hours	**18(17-2)**		

2.5 Course Contents

Course contents are defined in teaching / lesson plans. Lesson plans contain detailed course contents, CLOs, teaching and assessment methods and other necessary details. Lesson plans of MLT-406

Clinical Pathology, MLT-407 Hematology-I, HND-509 Clinical Biochemistry etc. are provided as samples in Annexure A.

2.6 Consistency of Program Delivery and Assessment Methods and their Support in PLO Attainment

The academic calendar is prepared by the Academics Branch AAUR at the start of the semester and is forwarded to all concerned. Concerned faculty prepares the teaching/lesson plans, which are forwarded to the Academics Branch and are uploaded on the Learning Management System (LMS) before the start of the semester. A course folder is maintained during the semester for each course. Updating the course folder is the responsibility of the concerned faculty member

2.6.1 Teaching Methods

Teaching methods are made an integral part of the teaching/lesson plan. Faculty members select an appropriate teaching method according to the learning level and desired outcomes. The teaching methods include presentations, lectures, videos, assignments, term projects. Sample lesson plans are attached as Annexure 'A'. To access the effectiveness of the teaching method, QED conduct the number of surveys to access the quality of education. The sample survey is attached in Annexure E.

2.6.2 Assessment Methods

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

Table 18: Examination Weight

Credit Hours	Quiz-Assignment	Mid-Examination	Final Examination	Practical
3(3-0)	20%	30%	50%	N/A

3(2-2)	13.33%	20%	33.33%	33.33%
2(2-0)	20%	30%	50%	N/A

The student must pass the practical final examination separately. A student is eligible to sit for the examination provided that he/she has attended not less than 75% of the classes in theory and practical, separately. The minimum pass marks for each course are 40% for undergraduates.

3 LABORATORIES AND COMPUTING FACILITIES

Criterion 3 Laboratories and Facilities

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

3.1 Science Labs

The details of the Science Labs including staff, related course work, type of workstations, are provided in Table 20.

- Number of total core/elective/Supporting computing Courses= 23
- Number of Lab courses = 23
- Number of laboratories = 5

Standard 3-2: There must be support personal for instruction and marinating the laboratories.

Table 19:Full Time Lab Engineers

Name	Designation	Highest Degree	Date of Joining-Resigning	Type of Job
Tayyab Mansor	Lab Attendant	---	2022	Permanent
Mr. Binyameen Bin Shafqat	Lab Attendant	M. Phil Bio Chem.	2021-2022	Permanent
Adnan	Lab Attendant	---	2021-2023	Permanent

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

Table 20: sciences Labs Details

Sr. No.	Name of Laboratory (Staff Names--Qualifications)	Lab(s) of Course(s) Conducted in the Lab.	Type(s) of Workstations (No. of each type)	Nature of Experiments	No. of Students per Workstation
1	Meal management and dietetics lab (Tayyab Mansoor)	MLT-404 Laboratory Instrumentation and Techniques MLT-306 Quality assurance and Lab. Management	No of working stations 10 with all required equipment, instruments and chemicals	Hands on / Demonstration	1:4
2	Food analysis and processing LAB Technician and attendant Tayyab Mansoor	MLT-307 Anatomy and Physiology-I MLT-403 Anatomy and Physiology-II MLT-408 Molecular Biology MLT-406 Clinical Pathology SCS-301 Moral foundation of education	Number of 10 Multimedia-1 White Board-1 Internet Access with required instruments and chemical	Hands on / Demonstration	1:4
3	Science LAB Technician and attendant Tayyab Mansoor	MLT-302 Phlebotomy MIC-311General Microbiology MLT-301Biochemistry-1 MLT-304 Biochemistry-II MLT-305 Clinical virology and Mycology MLT-401 Clinical Biochemistry MLT-402 Bacteriology and Parasitology MLT-407 Hematology-I MLT-405 Fundamentals of Enzymology	Number of 10 Multimedia-1 White Board-1 Internet Access with required instruments and chemical	Hands on / Demonstration	1:4
4	Computer lab A MR.WAQAS Technician	CS-301 Introduction to Computing Students work services	Number of computers 100 Multimedia	Demonstrations ,lectures,students work	1:1

			1 Whiteboard 1 Internet access	assignments	
5	Computer lab A MR.WAQAS Technician	STAT-301Statistics and Biometry Students work services	Number of computers 100 Multimedia 1 Whiteboard 1 Internet access	Demonstrations ,lectures,students work assignments	1:1

CRITERION 4 STUDENTS SUPPORT AND ADVISING

Criterion 4 Students Support and Advising

University administration has formulated centralized support and advising statues. These statues provide information regarding admission, scholarships, financial matters etc. GIMS arranges orientation to the newly admitted student in its capacity that is in addition to the central orientation session held for all students of the university. GIMS arranges curricular and extracurricular activities/events such as sports week, technical workshops and annual dinner.

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 HEC criteria.

- At the undergraduate level subjects/courses are offered as per the scheme of study provided by the HEC and approved by the Academic Council.
- Elective courses are offered as per the policy of HEC and the University.
- No course is offered consecutively in any two semesters.

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

Contents of all major courses at BS (MLT) contain an application development part. This part is assigned in the early weeks of the course. Students keep close interaction throughout the course with course instructor to accomplish the development of the said application. Assignments also increase interaction between student and teacher. The teaching methodology followed for BS(MLT) is both instructional and constructive, where students are taught and concepts and also guided to explore additional concepts of the course domain. This exploration binds students with the teacher for assistance and progression. Meetings of the Institutional Board of Studies design and improves the BS(MLT) courses. Course instructors of any major course normally invites other sibling faculty members for evaluation of student's presentation or software applications at the end of the course. This provides interaction of students to other faculty members as well. Institute always encourages the interaction between each section of BS(MLT) classes through software competitions held during student's week.

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.

Several steps have been taken to guide students by different ways such as:

- Students are informed about the program requirement through the director's office.
- Through the personal communication of the teachers with the students.
- Meetings are organized by the director of the Institute for counselling of the students. Besides, students can also contact with the relevant teachers whenever they face any problem.
- Students can meet the director of the institute whenever they feel the need to meet on any serious issue.
- Realizing the need for exploring job opportunities for university graduates, the Directorate of Placement Bureau has been established.

4.1 Mechanism for Providing Guidance to Students on Academic, Career and Aspects Pertaining to Wellness

4.1.1 Academic Counselling

Program coordinator and concerned faculty members help the students in decision of course enrolment and about their career path.

Table 21: Student Teacher Ratio

2022-2023	2023-2024
1:20	1:25

4.2 Students Workload, Class Sizes for Theory as well as Laboratory Sessions and Completion of Courses

4.2.1 Class Size

There are 22 to 24 students on average in each batch. During lab work each, students have a separate stations to perform tasks effectively.

4.2.2 Semester Academic Load

Academic load in a semester is in the range of 17-19 credit hours except final semester where 10 credit hours are taught. This has been done intentionally to provide students with maximum free time, as they have to move in the market for completion of their final year internships. Students also have to appear for the interviews conducted by the employers.

4.2.3 Completion of Course and Student Feedback

Course files are prepared for each course and are available with the academic department. Instructors are required to submit a course teaching / lesson plan. HOD ensures completion and conduct of the course as per schedule. Student feedback is taken twice every semester on learning management system (LMS). Sample teacher and Course evaluation is provided in Annexture D. Student Activities and Involvement in Activities Providing Experience in Management and Governance, Representation in Education and Social Activities

4.2.4 Participation in Competitions

Students are encouraged to participate in extracurricular activities. Such activities are held within GIMS as well as outside GIMS. Students are facilitated by providing them transportation. Competitions held / participated in recent past are given in following sections.

4.2.5 Competitions / Events Held

Details of recent completions held are given in Table 23.

Table 22: Recent Events Held in GIMS

List of Events-Spring 2021-2023		
Sr. No	**Event**	**Date**
2	Blood bank Camp	April, 2023
3	Sports Gala 2023	March, 2023
5	Nutrition Gala and Health Camp	March, 2024
6	Poster and Model Competition	March, 2024

7	Sports Gala 2024	March, 2024

CRITERION 5 PROCESS CONTROL

Criterion 5 Process Control

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.

5.1 Requirements and Processes for Admission of Students to the Program, Response and Annual Intake

5.1.1 Admission Criteria

i A person holding Higher Secondary Certificate, A-level, or an equivalent certificate from any recognized institute with at least second division or overall 50% marks, or any other marks specified shall be eligible to apply for admission.

ii Admission will be on open merit basis, with the following weightage for merit (Entrance test 40%, Intermediate 50%, Matric 10%).

The admission criteria are laid out by the Arid Agriculture University and are part of GIMS statues. Admissions are handled by the Admission Office of GIMS for all programs of the GIMS.

5.1.2 Academic Standing

i Grade Point average

a) Maximum grade point average 4.00

b) Minimum grade point average for obtaining the Degree 2.50

ii To remain on the roll of the university, a student shall be required to maintain the following minimum CGPA in each semester:

Semester	CGPA
1st Semester	0.75
2nd Semester	1.00
3rd Semester	1.25
4th Semester	1.50
5th Semester	1.75
6th Semester	2.00

7th Semester	2.25
8th Semester	2.50

- A student who does not meet the above requirement for promotion shall cease to be on the university roll. However, he/she may repeat the whole semester only once.
- The course grades that a student earns in the repeated semester shall replace the previously earned course grades.
- In the 8th semester, if a student fails to achieve the 2.5 CGPA, he/she shall have to repeat the course/courses with the lowest grades, to make CGPA of 2.5 within the maximum time period allowed for the degree.
- Migration from other universities and institutes to universities will be entertained as per University migration rules.

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.

5.2 Examination and Weightage

Theory

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

Table 23: Examination Weights

Credit Hours	Quiz-Assignment	Mid-Examination	Final Examination	Practical
3(3-0)	20%	30%	50%	N/A
3(2-2)	13.33%	20%	33.33%	33.33%
2(2-0)	13.33%	20%	33.33%	N/A

Practical

The student must pass the practical final examination separately.

5.2.1 Eligibility for Examination

A student is eligible to sit for the examination provided that he/she has attended not less than 75% of the classes in theory and practical, separately. The minimum pass marks for each course are 40% for undergraduates.

Standard 5-3: The process of recruiting and retaining highly qualified faculty must be in place and clearly documented. Also processes and procedure for faculty evaluation, promotion must be consistent with institution mission statement.

5.3 Faculty Development, Training and Retention

5.3.1 Faculty Training and Mentoring

Following opportunities and facilities are available for faculty training and mentoring.

- The new faculty attends orientation training and methods of instruction workshop.
- GIMS sometimes conducts faculty training to enhance the educational experience.

5.3.2 Faculty Retention and Career Planning

Faculty is one of the most important parts of the SMME and hiring and retention of best-in-class faculty is the topmost priority of the school. For this purpose, the following are being offered.

- GIMS offers a competitive pay package.
- Full funding for attending National/ International conferences/ seminars/ Workshops.
- Financial support for carrying out Masters & Doctoral studies.
- Funding through government and non-profit national and international organizations is facilitated.
- Promotions are based on experience and research work.
- The teaching load is based on the guidelines provided by the HEC so faculty can spend most of their time in research.

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 it is meeting objective.

5.4 Strength and Competencies of Academics Staff covering all Areas of the Programme

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.

GIMS has a mix of qualified and experienced faculty members for teaching and research. Most of the faculty member have qualifications from leading universities of the world. The pyramid of academic architecture of GIMS is shown in Figure below.

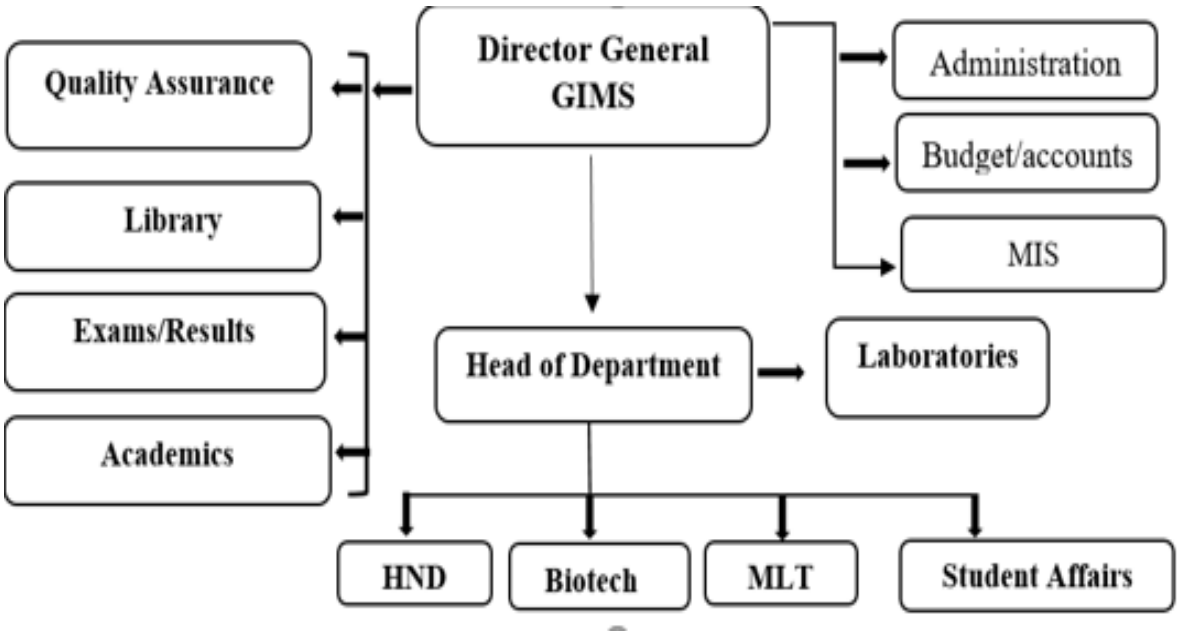

Figure 3: Academic Pyramid

CRITERION 6 FACULTY

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.

6.1 Faculty

Details of faculty in GIMS is given below.

Present Scenario

Full-Time Faculty Size	Number of faculty members with PhD MS	Full Professors	Associate Professors	Assistant Professors	Lecturers	Teaching Assistants/Fellows
	0 14			-	14	

Faculty Profile

Name	Designation	Highest Degree	Subject/Discipline of Highest Degree	Faculty Type (Permanent/ Contract)	Year of Joining-Resigning
Dr. Zartash Zahra	Assistant Professor	Ph.D.	Biochemistry & Molecular Biology	Permanent	2021
Mr Usman Adress	Lecturer	MPhil	Medical lab technology	Permanent	2022-24
Ms Mahnoor Zaheer	Lecturer	MPhil	Biotechnology	Permanent	2024
Mr. Danish Baig	Lecturer	MPhil	Biotechnology	Permanent	2022-2023
Ms. Naumana Kanwal	Lecturer	MPhil	English Translation	Permanent	2021
Ms. Mariam Mushtaq	Lecturer	MPhil	English Translation	Permanent	2019
Ms. Maria Ashraf	Lecturer	MPhil	Mathematics	Permanent	2019

Ms. Huma Basharat	Lecturer	M.Phil.	Physiology	Visiting	2024
Dr. Mirza Bahashat Baig	Lecturer	Ph.D.	Islamic Studies	Visiting	2019-2023
Dr. Aleena Javed	Lecturer	Masters	Physiotherapy	Visiting	2022-2023
Prof. Dr. Muhammad Habib	Lecturer	M.Phil.	Human Anatomy	Visiting	Since 2022

6.2 Faculty Distribution by Programme Area

Table 24: Faculty Distribution by Programme Area

Program Area of Specialization	Course in Area	Average Number of Section per Year	Number of Faculty Members in Each Area
Clinical lab technology	2	2	1
Non lab technology	1	3	1
General Education	3	3	2

6.2.1 Full Time Lab Engineers

Table 25: Full Time Lab Engineers

Name	Designation	Highest Degree	Date of Joining-Resigning	Type of Job
Tayyab Mansor	Lab Attendant	---	2022	Permanent
Mr. Binyameen Bin Shafqat	Lab Attendant	M. Phil Bio Chem.	2021-2022	Permanent
Adnan	Lab Attendant	---	2021-2023	Permanent

6.2.2 Faculty Members at GIMS and Ratio of Course offering

Table 26: Part Time Faculty Members at GIMS

Semester	Number of Faculty Members		Total Number of Courses Offered by the Institute	Number of Courses Taught by Faculty		Average Teaching Load for full time teacher
	Full-time	Part-time		Full-time	Part-time	
(Fall-2022)	**5**	**8**	**30**	**12**	**18**	**9-12**
(Spring-2023)		**8**	**26**	**13**	**13**	**9-12**
(Fall-2023)	**6**	**8**	**22**	**10**	**12**	**9-12**
(Spring-2024)	**6**	**7**	**19**	**9**	**10**	**9-12**

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.

6.3 Overall Staff Workload

6.3.1 Faculty Workload

Table 27: Teaching Load

Teaching load Based on 2021	
Lecturer	12-14 Cr. Hr

6.4 Faculty Development, Training and Retention

6.4.1 Faculty Training and Mentoring

Following opportunities and facilities are available for faculty training and mentoring.

- The new faculty attends orientations training and methods of instruction workshop.
- During last two years' faculty training was arranged

6.4.2 Faculty Retention and Career Planning

Faculty is one of the most important part of the GIMS and hiring and retention of best-in-class faculty is the top most priority of the school. For this purpose, following are being offered.

- GIMS offers a competitive pay package.
- Funding for attending seminars/ workshops available for faculty members.
- Funding through government and non-profit national and international organizations is facilitated.
- Promotions are based on experience and contribution made for academics.
- Teaching load is based on the guidelines provided by the HEC.

6.5 Sufficiency and Competency of Technical and Administrative Staff in Providing Adequate Support to the Educational Programme

6.5.1 Sufficiency and Competency of Technical Staff

The lab technicians and lab engineers are well qualified and meet the qualification requirements of their respective jobs. Lab engineers have B.Sc / M. Sc. Degrees in lab Technology.

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

6.5.2 Sufficiency and Competency of Administrative Staff

GIMS has adequate number of administrative staff for office and administration jobs. Administrative staff of the department is headed by Admin Manger. The staff is responsible for general upkeep of the GIMS building and offices. In case of medical emergency, a number of staff is trained to provide first aid. They are also responsible in case of a fire emergency and have been designated as fire marshals. The administrative staff is also responsible for office work,

6.6 Faculty Survey

To measure the faculty satisfaction and identifying their experience at GIMS, QED conducted faculty Survey at end of each semester. Faculty surveys help to identify faculty member level satisfaction and their experience with administrative staff and faculty members. Faculty member suggestions and feedback help to improve the department working. The faculty survey results are available in annexure F.

Standard 6-4: There must be an adequate number of high-quality graduate students, research assistants and Ph.D. students.

GIMS is not accredited for a PhD Degree. Teaching Assistants positions are not available for GIMS.

CRITERION 7 INSTITUTIONAL FACILITIES

Criterion 7 Institutional Facilities

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

7.1 Adequacy of Teaching and Learning Facilities

The adequacy of teaching and learning facilities that include classrooms, learning-support facilities, study areas, information resources, library, computing and information-technology, etc. is described in following sections.

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.

7.1.1 Lecture Facilities

The GIMS building is situated within the premises of Kalra Khasa Gujrat. GIMS has its own building. Construction of an additional wing is also in progress. The building has following facilities:

- Classrooms: 15
- Seating capacity of each classroom: 50
- Audio-Video facilities: Computer, multimedia projector, audio system • Seminar Hall with seating capacity of 100 shared with other departments

7.1.2 Science Laboratories

Following dedicated laboratories are available.

- Computational Lab A
- Computational Lab B
- SCIENCE LAB
- HND LAB 1
- HNDLAB 2

The science labs' facilities have latest equipment's attached with systems including visual studio, gel electrophoresis, spectrophotometer, biosafety cabinets etc.

7.1.3 Library

The GIMS Library has following facilities.

- Institute has its own library which has sufficient number of computer science related books. New books are regularly bought, but currently library contains low-cost editions. Expensive books are unavailable. A book bank is also required which provides effective support to students.
- Access to HEC Online Library via HEC.
- Reproduction facility is also available in the form of printing press in GIMS where computing and other subject books like mathematics are being printed after necessary permission.

7.1.4 Sports

At GIMS the implementation of a wholesome policy helps shape students personalities and careers in a more efficient manner. Students are, therefore, encouraged to participate in various sports competitions held as a regular feature of the campus life. The following facilities are available in GIMS main campus.

- Badminton Court 1
- Table Tennis Total 2, 1 x Girls, 1 x Boys
- Badminton Court 12
- Table Tennis Total 4, 3 x Girls, 1 x Boys

7.1.5 Transport

GIMS maintains an organized transportation network within the campus for the students and staff. Vans provide transport from Gate 1 from 8:30 to 9:30 am. GIMS provide transportation within Gujrat city and outside Gujrat. Transportation facilities provided to students of Kharrian, Jalapur Jattan, Lalmusa.

CRITERION 8 INSTITUTIONAL SUPPORT

Criterion 8 Institutional Support

8.1 Institutional Financial Commitment and Support

Standard 8-1: The library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personnel.

8.2 Income and Expenditure Details

Standard 8-2: Financial resources must be provided to acquire and maintain library holdings, laboratories and computing facilities.

Standard 8-3: Financial resources must be provided to acquire and maintain library holdings,

Table 28: Income and Expenditure Details

Total endowment fund of the institution	Rs. 1000000/-	**0.435 (In Millions)**	**15.72 (In Millions)**
Yearly budget for the past five years	**2021-2022**	**2022-2023**	**2023-2024**
	60130000	14.29	0.315
Institution's yearly budget for research and faculty development for the past five years	**-**	0.435-	0.479
Institution's yearly budget for library	659740	0.559	0.615

Institution's yearly budget for computing facilities	225000	1.429	1.572
Department/school/ college's yearly budget for research and faculty development for the past five years	150000	0.435	0.479
Fee Structure	Subsidized Fee: Rs.20450	Subsidized Fee: Rs.19250	Subsidized Fee: Rs.20450
	Regular Fee: Rs.36400	Regular Fee: Rs.34850	Regular Fee: Rs.36200
What are sources of income	Semester/Tuition Fee	Semester/Tuition Fee	Semester/Tuition Fee

CONTINUOUS QUALITY IMPROVEMENT

Continuous Quality Improvement

Program Planning

Curriculum Development

The curriculum of the Programme BS(MLT)was developed to meet the requirements of HEC. A comprehensive exercise was carried out among all the stakeholders to unify the curriculum. During that phase, experts from all the AAUR departments and affiliated institute were brought together and careful deliberations were carried out. The finalised unified curriculum is implemented and taught in AAUR and Affiliated institutes. A number of elective courses are available for students to choose to increase their depth and breadth of knowledge.

Curriculum Review

A comprehensive policy exits at AAUR and GIMS level for curriculum review and updating. The curriculum could be reviewed on the basis of a number of factors including HEC revision of curriculum requirements, feedback from stakeholders, etc.

Content Review

Courses are assigned to the faculty at the start of the semester. The content of each course has been defined by the department and a lesson / teaching plan is prepared by the concerned faculty based on the approved course contents. The faculty member is allowed to change 10% of the course content of a course. Sample lesson plans are provided at Annexure 'D'. The lesson plans include detailed content breakdown, teaching methods and assessment methods.

Response to Feedback

Feedback from faculty and students is collected on regular basis through the LMS system. Students are required to provide feedback once during the course. The anonymous feedback becomes available to the concerned faculty for review and any necessary action. Faculty also

provides feedback at the end of the course. The feedback provided by faculty and students is monitored by the QED, Academic Directors, HODs,

Various type of feedbacks obtained from alumni, faculty, students, employers, etc. are addressed at various levels during the faculty meetings.

Tracking of Contribution of Individual Courses to PLOs

The course learning outcomes for each course has been defined and linked with appropriated programme learning outcomes. The assessment methods of CLOs are part of the lesson plans where a specific CLO may be evaluated using any suitable assessment method. The assessment methods include quizzes, assignments, presentations, reports, term projects, end semester exams, etc. Specific CLO is attributed to a specific question. The question papers are approved by the HOD for appropriate level of learning and difficulty. The complete record of CLO attainment is maintained in the Academics Branch.

Annexure A: Lesson Plan

Lesson Plan:

PMAS Arid Agriculture University Rawalpindi

Gujrat Institute of Management Sciences

Department of MLT

Course code and Title

MLT-306	**Quality Assurance and Lab.Management Lab 3(2-2)**

Course Prerequisites

Course Code	Title
NIL	

Instructor's Information

Full Name:	Usman Adrees
Email:	Usmanadrees0@gmail.com
Contact Number	03002929336
Office Hours & Location	-
Teaching Assistant (if any)	-

Course Composition

	Credit Hours	Weekly	Duration (hrs)	Contact Hours
Lectures	2	2	1.0	2.0
Laboratories	1	1	2.0	2.0

Course description for theory:

Quality control introduction,concept and costs,The quality management system model,History oflaboratory quality management, International laboratory standards, Importance of laboratory qualitycontrol in each department of clinical lab requirements, quality policy and objectives, Gooddocumentation practice,Quality Manual and procedures.Document control Client requirements andsubcontracting,Purchasing Improvement elements,Records and management of records Internalaudits and management,review Staff issues and managing change,Facilities and safety EquipmentPurchasing and inventory,Process control sample management, Process control introduction toquality control,Calibration and measurement traceability,Assessment-audits Assessment externalquality,assessment norms and accreditation, Personnel Customer service

Text book

1. Laboratory quality management system:handbook. World Health Organization
2. Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics,7th edition
3. Laboratory Management:Principles and Processes 2nd Edition by Denise M.HarmeningBurtis, C., E. Ashwood and D. Burns. 2006. Tietz Text Book of Clinical Chemistry and Molecular Diagnostics, 4th Ed. Elsevier Saunders Company, Philadelphia, USA.
4. Chawala, R. 2014. Practical Clinical Biochemistry: Methods and Interpretations, 4th Ed. Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, India.
5. Devlin, T. M. 2005. Textbook of biochemistry with clinical correlations, 6th ed. Wiley-Liss, Inc., U.S.A.

Course Assessment

Theory Total Marks= 40 Mid Exam Marks: 12 Quiz/Assignment (Including Labs): 04 Final Exam Marks: 24 **Practical Total Marks= 20** Project Marks: 06 Final Practical Marks: 14 **Total Course Marks: 60**	**Grading Criteria:** >=48 Grade A >=39 Grade B >=30 Grade C >=24 Grade D <24 Grade F Min. 16 marks required in theory and Min. 08 marks required in practical to pass the course.

Course Outline and Contents

	Lecture	Topics Covered	Textbook Section

Week 1	1	Quality control Introduction, concept and costs	
	2	The quality management system model	
Week 2	3	History of laboratory quality management	
	4	Quality control of lab	
Week 3	5	International laboratory standards	
	6	Importance of laboratory quality control in each department of clinical lab requirements.	
Week 4	7	Importance of laboratory quality control in each department of clinical lab requirements	
	8	quality policy and objectives	
Week 5	9	Good documentation practice	
	10	Quality Manual and procedures	
Week 6	11	Document control Client requirements and subcontracting	
	12	Document control Client requirements and subcontracting	
Week 7	13	Purchasing Improvement elements	
	14	Records and management of records	

Week 8	15	Quiz 1	
	16	Internal audits and management	
Week 9	17	review Staff issues and managing change	
	18	Quiz 2	
Week 10	19	review Staff issues and managing change	
	20	Facilities and safety Equipment.	
Week 11	21	Assignment 1	
	22	Purchasing and inventory	
Week 12	23	Process control sample management, Process control introduction to quality control,	
	24	Assignment 2	
Week 13	25	Calibration and measurement traceability	
	26	Assessment-audits Assessment external quality	
Week 14	27	assessment norms and accreditation	
	28	Personnel Customer service Occurrence management	
Week 15	29	Process improvement Documents and records	
	30	Information management Organization	
Week 16	31	Computer Equipment management. Computer issues	
	32	Quality control and Proficiency Testing programs	

Course Description for lab:

Record Keeping and Maintenance. Training on ISO certification.Inventory Maintenance.

Course Outline and Contents

	Lecture	Topics Covered	Textbook Section
Week 1	1	Record Keeping and Maintenance.	
	2	Record Keeping and Maintenance.	
Week 2	3	Record Keeping and Maintenance.	
	4	Record Keeping and Maintenance.	
Week 3	5	Training on ISO certification	
	6	Training on ISO certification	
Week 4	7	Training on ISO certification	
	8	Training on ISO certification	
Week 5	9	Training on ISO certification	
	10	Training on ISO certification	
Week 6	11	Document control Client requirements and subcontracting	
	12	Training on ISO certification	

Week 7	13	Purchasing Improvement elements	
	14	Records and management of records	
Week 8	15	Quiz 1	
	16	Training on ISO certification	
Week 9	17	review Staff issues and managing change	
	18	Quiz 2	
Week 10	19	Inventory Maintenance	
	20	Facilities and safety Equipment.	
Week 11	21	Assignment 1	
	22	Purchasing and inventory	
Week 12	23	Process control sample management, Process control introduction to quality control,	
	24	Assignment 2	
Week 13	25	Inventory Maintenance	
	26	Inventory Maintenance	
Week 14	27	Inventory Maintenance.	
	28	Personnel Customer service Occurrence management	
Week 15	29	Process improvement Documents and records	
	30	Information management Organization	
Week 16	31	Computer Equipment management. Computer issues	
	32	Quality control and Proficiency Testing programs	

Assessment Schedule - Tentative

Give your tentative assessment plan with submission due date.

S. No.	Artifact	Due Date	Remarks
1	Assignment 1	11th Week	
2	Quiz 1/Viva	8th Week	
3	Assignment 2	12th Week	
4	Quiz 2/Viva	9th Week	
5	Mid Term		
6	Assignment 3		
7	Quiz 3/Viva		
8	Project/ Presentation		
9	Terminal Examination		

The course teacher may add quizzes, project or more assignment as he/she may deemed fit

Policy & Procedures

- **Attendance Policy:** Every student must attend 75% of the lectures delivered in this course and 75% of the practical/laboratory work prescribed for the respective courses. The students falling short of required percentage of attendance of lectures/seminars/practical/laboratory work, etc., shall not be allowed to appear in the terminal examination of this course and shall be treated as having failed this course.
- **Grading Policy:** The minimum passing marks for this course shall be 16 out of 40 in theory. Students obtaining less than 16 marks out of 40 in this course shall be deemed to have failed the course. Similarly, in practical's, students must obtain at least 8 out of 20 to pass this subject. Failing either theory or practical will be considered a failure in the course.
- **Teaching Pedagogy:** Classroom direct instructions, whiteboard, multimedia, , case studies, assignments and projects
- **Academic Integrity:** All policies regarding ethics apply to this course. The students are advised to discuss their grievances/problems with their counsellors or course instructor in a respectful manner.
- **Plagiarism Policy:** Plagiarism, copying and other anti-intellectual behavior are prohibited by the university regulations. Violators may have to face serious consequences.

Course code and Title

MLT-406	**Clinical Pathology3(2-2)**

Course Prerequisites

Course Code	Title
NIL	

Instructor's Information

Full Name:	Usman Adrees
Email:	Usmanadrees0@gmail.com
Contact Number	03002929336
Office Hours & Location	-
Teaching Assistant (if any)	-

Course Composition

	Credit Hours	Weekly	Duration (hrs)	Contact Hours
Lectures	2	2	1.0	2.0
Laboratories	1	1	2.0	2.0

Course Description

Introduction to Chemical Pathology and Definitions of basic Terms: History and clinical significance function tests, renal failure: Acute renal failure, chronic renal failure, Causes of increased and excretion of sodium, Interpretation of disease associated with renal function. Liver Function Tests and Hyperbilirubinemia and jaundice: Formation of bilirubin, unconjugated and conjugated bilirubin, symptoms, classification and causes of jaundice, causes of conjugated and unconjugated hyperbilirubinemia, Neonatal Jaundice: Physiological, Pathological, The biochemical assessment of the liver: Routine liver function tests, Special tests for liver. Malabsorption: Digestion and absorption of

Text book

1. A Quick Guide for Clinical Biochemistry by Mohamed Essa (2019)
2. Basic Concepts inClinical Biochemistry: A Practical Guide by Vijay Kumar,KiranDip Gil(2018)
3. ClinicalChemistry,9th Edition William Marshall, Márta Lapsley,Andrew Day,KateShipman(2020)

Course Assessment

Theory Total Marks= 40 Mid Exam Marks: 12 Quiz/Assignment (Including Labs): 04 Final Exam Marks: 24 **Practical Total Marks= 20** Project Marks: 06 Final Practical Marks: 14 **Total Course Marks: 60**	**Grading Criteria:** >=48 Grade A >=39 Grade B >=30 Grade C >=24 Grade D <24 Grade F Min. 16 marks required in theory and Min. 08 marks required in practical to pass the course.

Course Outline and Contents for theory:

	Lecture	Topics Covered	Textbook Section
Week 1	1	Introduction to Chemical Pathology and Definitions of basic Terms	
	2	History and clinical significance renal function tests, renal failure: Acute renal failure, chronic renal failure	
Week 2	3	Causes of increased and excretion of sodium, Interpretation of disease associated with renal function.	
	4	Liver Function Tests and Hyperbilirubinemia and jaundice: Formation of bilirubin	
Week 3	5	unconjugated and conjugated bilirubin, symptoms, classification and causes of jaundice, causes of conjugated and unconjugated hyperbilirubinemia	

	6	Neonatal Jaundice: Physiological, Pathological, The biochemical assessment of the liver: Routine liver function tests, Special tests for liver.	
Week 4	7	Malabsorption: Digestion and absorption of fats, carbohydrates and protein, Iron, Folate & Vitamin B12 Absorption, Pathophysiology, etiology, sign	
	8	symptoms of malabsorption, Clinical and laboratory manifestations of malabsorption, Suggested evaluation of malabsorption,	
Week 5	9	Ketonuria: Pathophysiology, clinical significance and diagnostic test of ketone bodies, Ketone bodies associated disease	
	10	Osteomalacia and rickets: Physiology and Pathophysiology of Vitamin D	
Week 6	11	Calcium and Vitamin D association, Defective vitamin D metabolism, Vitamin D deficiency	
	12	Role of vitamin D-dependent mechanisms in absorption of food calcium, Role of vitamin D-independent mechanisms in absorption of food calcium	
Week 7	13	Hypervitaminosis D and associated risk, Osteomalacia, Osteoporosis and Rickettsia, Pathogenesis, diagnostic criteria and associated diagnostic findings for rickets and Osteomalacia,	
	14	Tumor marker: Ideal tumor marker, Advantages of tumor marker, Specific tumors markers from various organs	
Week 8	15	Quiz 1	
	16	Thyroid tumors: Calcitonin., Breast tumors: CA 15-3, CA 549,CK-BB,BRCA-1	
Week 9	17	Testicular tumors: HCG, AFP, Calcitonin, Prostatic tumors: PSA, CA 549, PAP	
	18	Quiz 2	

Week 10	19	Bone tumors: Alkaline phosphatase, Lung tumors: CA 15-3, CA 549, CK-BB	
	20	Liver tumors: Alkaline phosphatase, AFP,CA 19-9,LDH.,Gastrointestinal tumors: CEA, CA 50,CA 19-5,CA 19-9,CA72-4	
Week 11	21	Assignment 1	
	22	Colorectal tumors: CEA, CA 15-3,CA 19-9,CA 50., Ovarian tumors: CA 125,CA 15-3,CA 549,CK-BB,CA 72-4	
Week 12	23	Pancreatic tumors: CEA, CA 50,CA 19-9,CA 15-3	
	24	Assignment 2	
Week 13	25	Multiple myeloma: Bence jones proteins	
	26	Alpha Fetoprotein-al-Fetoprotein	
Week 14	27	Beta-HCG Level,β-HCG, Human chorionic gonadotropin (HCG)	
	28	Amenorrhea: Types and causes of amenorrhea	
Week 15	29	Primary and secondary amenorrhea, Symptoms and diagnose of amenorrhea	
	30	Evaluation scheme for primary and secondary amenorrhea, Hormonal investigation for amenorrhea.	
Week 16	31	Myxedema: Pathogenesis, significance and symptoms and diagnosis of Myxedema Crisis	
	32	Difference between Myxedema and Hypothyroidism	

Course Description

Lab Investigations in Renal Disease: Serum Creatinine, Serum Urea, Creatinine Clearance,24-houruri ne collection, Calculation of Creatinine Clearance, Serum Electrolytes, Lab Investigation of Liver: Serum Bilirubin, Total and Direct Bilirubin, ALT&AST, ALP&GGT, Lab Investigations For Bones: Serum Calcium, Vitamin D, Magnesium, Phosphorus, Alkaline Phosphatase, Malabsorption common Lab Investigations: The 14 C-xylose breath test, The hydrogen (H2) breath test, The Schilling test for Vitamin B12,Sudan III staining and other tests for fats in stool, Tumor MarkersAssay:C-125 Marker assay for Breast cancer, PSA For Prostate, HCG for Germ cells and Trophoblastic Tumors, AFP For Liver cancer, Rothera's test for ketone bodies, Calculation of Creatinine Clearance Test

Text book/Reference books & Material

1. A Quick Guide for Clinical Biochemistry by Mohamed Essa (2019) 2. 2. Basic Concepts inClinical Biochemistry: A Practical Guide by Vijay Kumar,KiranDip Gil(2018) 3. ClinicalChemistry,9th Edition William Marshall, Márta Lapsley,Andrew Day,KateShipman(2020)

Course Assessment

Theory Total Marks= 40 Mid Exam Marks: 12 Quiz/Assignment (Including Labs): 04 Final Exam Marks: 24 **Practical Total Marks= 20** Project Marks: 06 Final Practical Marks: 14 **Total Course Marks: 60**	**Grading Criteria:** >=48 Grade A >=39 Grade B >=30 Grade C >=24 Grade D <24 Grade F Min. 16 marks required in theory and Min. 08 marks required in practical to pass the course.

Course Outline and Contents for lab:

	Lecture	Topics Covered	Textbook Section

Week 1	1	Lab Investigations in Renal Disease: Serum Creatinine, Serum Urea	
	2	Lab Investigations in Renal Disease: Serum Creatinine, Serum Urea	
Week 2	3	Creatinine Clearance,24-houruri ne collection	
	4	Calculation of Creatinine Clearance	
Week 3	5	Serum Electrolytes	
	6	Lab Investigation of Liver: Serum Bilirubin, Total and Direct Bilirubin, ALT&AST, ALP&GGT	
Week 4	7	Lab Investigations For Bones: Serum Calcium, Vitamin D	
	8	Magnesium, Phosphorus, Alkaline Phosphatase	
Week 5	9	Malabsorption common Lab Investigations	
	10	The 14 C-xylose breath test	
Week 6	11	The hydrogen (H2) breath test	
	12	The Schilling test for Vitamin B12	
Week 7	13	Sudan III staining and other tests for fats in stool	
	14	Tumor marker: Ideal tumor marker, Advantages of tumor marker, Specific tumors markers from various organs	

Week 8	15	Quiz 1	
	16	Tumor MarkersAssay	
Week 9	17	CA-125 Marker assay for Breast cancer,	
	18	Quiz 2	
Week 10	19	PSA For Prostate	
	20	PSA For Prostate	
Week 11	21	Assignment 1	
	22	HCG for Germ cells	
Week 12	23	HCG for Trophoblastic Tumors	
	24	Assignment 2	
Week 13	25	Multiple myeloma: Bence jones proteins	
	26	Alpha Fetoprotein-al-Fetoprotein	
Week 14	27	AFP For Liver cancer	
	28	Rothera's test for ketone bodies	
Week 15	29	Calculation of Creatinine Clearance Test	
	30	Calculation of Creatinine Clearance Test	
Week 16	31		
	32		

Assessment Schedule - Tentative

Give your tentative assessment plan with submission due date.

S. No.	Artifact	Due Date	Remarks
1	Assignment 1	11th Week	
2	Quiz 1/Viva	8th Week	
3	Assignment 2	12th Week	
4	Quiz 2/Viva	9th Week	
5	Mid Term		
6	Assignment 3		
7	Quiz 3/Viva		
8	Project/ Presentation		
9	Terminal Examination		

The course teacher may add quizzes, project or more assignment as he/she may deemed fit

Policy & Procedures

- **Attendance Policy:** Every student must attend 75% of the lectures delivered in this course and 75% of the practical/laboratory work prescribed for the respective courses. The students falling short of required percentage of attendance of lectures/seminars/practical/laboratory work, etc., shall not be allowed to appear in the terminal examination of this course and shall be treated as having failed this course.
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- **Teaching Pedagogy:** Classroom direct instructions, whiteboard, multimedia, , case studies, assignments and projects
- **Academic Integrity:** All policies regarding ethics apply to this course. The students are advised to discuss their grievances/problems with their counsellors or course instructor in a respectful manner.
- **Plagiarism Policy:** Plagiarism, copying and other anti-intellectual behavior are prohibited by the university regulations. Violators may have to face serious consequences.

Course code and Title

MLT-407	**Hematology-I**	**3(2-2)**

Course Prerequisites

Course Code	Title
NIL	

Instructor's Information

Full Name:	Usman Adrees
Email:	Usmanadrees0@gmail.com
Contact Number	03002929336
Office Hours & Location	-
Teaching Assistant (if any)	-

Course Composition

	Credit Hours	Weekly	Duration (hrs)	Contact Hours
Lectures	2	2	1.0	2.0
Laboratories	1	1	2.0	2.0

Course Description

Introduction to hematology, physiology of blood and composition. Introduction to bone marrow, structure and function of bone marrow. Hematopoiesis (Intra-uterine and extra-uterine)-Stages of erythropoiesis, Myelopoiesis, Megakariopoiesis/Thrombopoiesis. Role of growth factors in hematopoiesis-erythropoiesis, granulopoiesis and megakariopoiesis. Morphology of red blood cells, white blood cells and platelets. Complete blood count and its importance. Introduction to hemoglobin structure, synthesis and function. Defects of RBCs Morphology and inclusion bodies. Red cell indices. Introduction to anemia and classification. Microcytic hypochromic anaemia. Iron deficiency anaemia; Sideroblastic anaemia; Anaemia of chronic disorders; Anaemia associated with lead poisoning. Macrocytic anaemia. Megaloblastic anaemia- Role of Vitamin B 12 and Folate deficiency; Pernicious anaemia. Non-Megaloblastic anaemia. Normocytic normochromic anaemia. Haemolytic anaemia (Extra and Intravascular haemolysis). Congenital- Due to membrane defects- Hereditary spherocytosis, Hereditary elliptocytosis; Due to metabolism defect-G6PD enzyme deficiency anaemia; Due to defects in Haemoglobin- Sickle cell anaemia. Acquired-Autoimmune and alloimmune, PNH. Aplastic anaemia. Haemoglobinopathies- Type of thalassemia, Sickle cell disease, HbC, HbD, HbE diseases.

Text book

1. Essential of Hematology, A.V Hoff Brand, 6th edition 2006
2. Clinical Hematology, G.C Degrunchi, 5th edition 2002
3. Practical Hematology, Dacie J.V. 10th edition 2012

Course Assessment

Theory Total Marks= 40 Mid Exam Marks: 12 Quiz/Assignment (Including Labs): 04 Final Exam Marks: 24 **Practical Total Marks= 20** Project Marks: 06 Final Practical Marks: 14 **Total Course Marks: 60**	**Grading Criteria:** >=48 Grade A >=39 Grade B >=30 Grade C >=24 Grade D <24 Grade F Min. 16 marks required in theory and Min. 08 marks required in practical to pass the course.

Course Outline and Contents for theory:

	Lecture	Topics Covered	Textbook Section
Week 1	1	Introduction to hematology, physiology of blood and composition.	
	2	Introduction to bone marrow, structure and function of bone marrow.	
Week 2	3	Hematopoiesis (Intra-uterine and extra-uterine)- Stages of erythropoiesis	
	4	Myelopoiesis, Megakariopoiesis/Thrombopoiesis	
Week 3	5	Role of growth factors in hematopoiesis	
	6	erythropoiesis, granulopoiesis and megakariopoiesis	
	7	Morphology of red blood cells, white blood cells and platelets. Complete blood count and its importance.	

Week 4	8	Morphology of white blood cells	
Week 5	9	Morphology of platelets.	
	10	Complete blood count and its importance.	
Week 6	11	Introduction to hemoglobin structure, synthesis and function	
	12	Defects of RBCs Morphology and inclusion bodies.	
Week 7	13	Red cell indices	
	14	Introduction to anemia and classification	
Week 8	15	Quiz 1	
	16	Microcytic hypochromic anaemia.	
Week 9	17	Iron deficiency anaemia; Sideroblastic anaemia;	
	18	Quiz 2	
Week 10	19	Anaemia of chronic disorders; Anaemia associated with lead poisoning.	
	20	Macrocytic anaemia	
Week 11	21	Assignment 1	
	22	Megaloblastic anaemia- Role of Vitamin B 12 and Folate deficiency	
Week 12	23	Pernicious anaemia. Non-Megaloblastic anaemia.	
	24	Assignment 2	
	25	Normocytic normochromic anaemia. Haemolytic anaemia (Extra and Intravascular haemolysis).	

Week 13	26	Congenital- Due to membrane defects	
Week 14	27	Hereditary spherocytosis, Hereditary elliptocytosis	
	28	Due to metabolism defect-G6PD enzyme deficiency anaemia	
Week 15	29	Due to defects in Haemoglobin- Sickle cell anaemia	
	30	Acquired-Autoimmune and alloimmune, PNH. Aplastic anaemia.	
Week 16	31	Haemoglobinopathies- Type of thalassemia	
	32	Sickle cell disease, HbC, HbD, HbE diseases.	

Course Outline and Contents for lab:

	Lecture	Topics Covered	Textbook Section
Week 1	1	Introduction to hematology, physiology of blood and composition.	
	2	Introduction to bone marrow, structure and function of bone marrow.	
Week 2	3	Introduction to vaccutainer tubes	
	4	color codes of vaccutainer tubes & its uses	
Week 3	5	Arteries	
	6	veins	
	7	Blood collection by venipuncture.	

Week 4	8	Blood collection by venipuncture.	
Week 5	9	Blood collection by capillary puncture.	
	10	Preparation of serum and plasma	
Week 6	11	Blood Smear Preparation	
	12	Types of blood smear, thick and thin smear	
Week 7	13	Staining of Blood Smear.	
	14	White blood cell count (WBC)	
Week 8	15	Quiz 1	
	16	Red blood cell count (RBC).	
Week 9	17	Platelet count.	
	18	Quiz 2	
Week 10	19	Differential white blood count.	
	20	Hematocrit red blood cell volume (HCT).	
Week 11	21	Assignment 1	
	22	Red blood cell indices (measurements). Estimation of hemoglobin concentration (HB).	
Week 12	23	Estimation of hemoglobin concentration (HB).	
	24	Assignment 2	
	25	Identification of Anemia by examining blood smear under microscope.	

Week 13	26	Identification of Anemia by examining blood smear under microscope.	
Week 14	27	Identification of Anemia by examining blood smear under microscope.	
	28	Identification of Anemia by examining blood smear under microscope.	
Week 15	29	Identification of hemoparasites by examining blood smear under microscope	
	30	Identification of hemoparasites by examining blood smear under microscope	
Week 16	31	Identification of hemoparasites by examining blood smear under microscope	
	32	Identification of hemoparasites by examining blood smear under microscope	

I. Course code and Title

HND-509	**CLINICAL BIOCHEMISTRY**	**3(2-2)**

II. Course Prerequisites

Course Code	Title
NIL	

III. Instructor's Information

Full Name:	Usman Adrees
Email:	Usmanadrees0@gmail.com
Contact Number	03002929336
Office Hours & Location	-
Teaching Assistant (if any)	-

IV. Course Composition

	Credit Hours	Weekly	Duration (hrs)	Contact Hours
Lectures	2	2	1.0	2.0
Laboratories	1	1	2.0	2.0

V. Course Description

Clinical laboratory: organization and management, safety, good lab practices, quality control and assurance, reference range and normal values, laboratory data processing; Handling and processing of clinical samples; Effect of storage on composition of samples; Commonly used instruments in clinical laboratory: Microscope, Minilab apparatus, X-ray, ECG, MRI, ELISA reader, CT scan etc.; Symptomlogy and case histories of various diseases. Forensic science, Molecular basis of diagnosis.

Text book

6. Ahmed, N. 2011. Clinical Biochemistry. Oxford University Press, Oxford, UK.
7. Bain, B.J., I. Bates, M.A. Laffan and S.M. Lewis.2012. Practical Haematology, 11th Ed. Churchill Livingstone, Elsevier Ltd., New York, USA.

Reference books & Material

1- Burtis, C., E. Ashwood and D. Burns. 2006. Tietz Text Book of Clinical Chemistry and Molecular Diagnostics, 4th Ed. Elsevier Saunders Company, Philadelphia, USA.
2- Chawala, R. 2014. Practical Clinical Biochemistry: Methods and Interpretations, 4th Ed. Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, India.
3- Devlin, T. M. 2005. Textbook of biochemistry with clinical correlations, 6th ed. Wiley-Liss, Inc., U.S.A.

Course Assessment

Theory Total Marks= 40 Mid Exam Marks: 12 Quiz/Assignment (Including Labs): 04 Final Exam Marks: 24 **Practical Total Marks= 20** Project Marks: 06 Final Practical Marks: 14 **Total Course Marks: 60**	**Grading Criteria:** >=48 Grade A >=39 Grade B >=30 Grade C >=24 Grade D <24 Grade F Min. 16 marks required in theory and Min. 08 marks required in practical to pass the course.

Course Outline and Contents

	Lecture	Topics Covered	Textbook Section
Week 1	1	organization and management	
	2	safety of lab	
Week 2	3	good lab practices of lab	
	4	quality control of lab	

Week 3	5	Quality assurance of lab	
	6	reference range of different test	
Week 4	7	normal values of different test	
	8	laboratory data processing	
Week 5	9	laboratory data processing	
	10	Handling and processing of clinical samples	
Week 6	11	Handling and processing of clinical samples	
	12	Effect of storage on composition of samples	
Week 7	13	Effect of storage on composition of samples	
	14	Commonly used instruments in clinical laboratory	
Week 8	15	Quiz 1	
	16	Microscope	
Week 9	17	Microscope	
	18	Quiz 2	
	19	Minilab apparatus	

Week 10	20	Minilab apparatus	
Week 11	21	Assignment 1	
	22	X-ray	
Week 12	23	Advantages and disadvantages of X-ray	
	24	Assignment 2	
Week 13	25	ECG	
	26	Advantages and disadvantages of ECG	
Week 14	27	MRI	
	28	Advantages and disadvantages of MRI	
Week 15	29	ELISA reader	
	30	CT scan	
Week 16	31	Symptomlogy and case histories of various diseases. Forensic science	
	32	Symptomlogy and case histories of various diseases. Molecular basis of diagnosis	

Assessment Schedule - Tentative

Give your tentative assessment plan with submission due date.

S. No.	Artifact	Due Date	Remarks
1	Assignment 1	11th Week	
2	Quiz 1/Viva	8th Week	
3	Assignment 2	12th Week	
4	Quiz 2/Viva	9th Week	
5	Mid Term		
6	Assignment 3		
7	Quiz 3/Viva		
8	Project/ Presentation		
9	Terminal Examination		

The course teacher may add quizzes, project or more assignment as he/she may deemed fit

Policy & Procedures

- **Attendance Policy:** Every student must attend 75% of the lectures delivered in this course and 75% of the practical/laboratory work prescribed for the respective courses. The students falling short of required percentage of attendance of lectures/seminars/practical/laboratory work, etc., shall not be allowed to appear in the terminal examination of this course and shall be treated as having failed this course.
- **Grading Policy:** The minimum passing marks for this course shall be 16 out of 40 in theory. Students obtaining less than 16 marks out of 40 in this course shall be deemed to have failed the course. Similarly, in practical's, students must obtain at least 8 out of 20 to pass this subject. Failing either theory or practical will be considered a failure in the course.
- **Teaching Pedagogy:** Classroom direct instructions, whiteboard, multimedia, , case studies, assignments and projects
- **Academic Integrity:** All policies regarding ethics apply to this course. The students are advised to discuss their grievances/problems with their counsellors or course instructor in a respectful manner.
- **Plagiarism Policy:** Plagiarism, copying and other anti-intellectual behavior are prohibited by the university regulations. Violators may have to face serious consequences

Annexure B: Work Performance Evaluation

Performa for Teacher's Work Evaluation

Start Date: _____ **End Date:** _____

Instructor's Name: _____ **Course No:** _____

Class/Section: _____ **Name of Subject:** _____

Sr. No.	Percentage of Course Executed	Instructor Feedback	Reason (if not taken)	Cross Observation
1	Number of Assignments taken			
2	Number of Assignments taken			
3	Number of Presentation taken			
4	Number of Assignments marked			
5	Number of Assignments marked			
6	Number of Presentation marked			
7	Percentage of marks uploaded on sessional sheets/portal			
8	Any other activity done in the class			
9	Number of classes/labs taken			
10	Percentage of Content covered/highlighted			

Date: _____ **Verified by:** _____

Instructor Feedback:

Observer Feedback:

QED Feedback:

Date: _____ **Verified by:** _____

Survey for Enhancing Quality of Education

Instructor Name		**Department**	
subjects currently teaching			
1.	Subject in nature	€ Theoretical	€ Practical
Practical application:			
Does this subject meet the needs and expectations of industry?			
2.	Subject in nature	€ Theoretical	€ Practical
Practical application:			
Is this subject meets the need and expectations of industry?			
3.	Subject in nature	€ Theoretical	€ Practical
Practical application:			
Is this subject meets the need and expectations of industry?			
4.	Subject in nature	€ Theoretical	€ Practical
Practical application:			
Is this subject meets the need and expectations of industry?			
How quality graduates can be produced who would meet the expectations of employer in terms of the knowledge, skills, and competencies?			
Do you think, you are delivering updated knowledge?			
What mechanism do you suggest towards achieving learning outcomes of a given study program			
How do you define a good quality teacher			

What strategies do you generally use in class while teaching as how you clarify the concepts that you teach to your students?
How do you relate disciplinary knowledge to other subject areas?
Is this way working for students to make them clear?
How do you apply theoretical knowledge from discipline to practical situation?
What have you done to keep yourself up to date with developments in your subject area?
Do you plan your teaching in accordance to achieve the desire objectives?
What do you consider to be the key elements of teaching a successful lesson?
How many steps do you follow for planning a lesson? Can you give me an example of a lesson to which you consider good, and you are asked to repeat that lesson then what would you do to make that different?
What is your opinion about the use of modern instructional techniques in teaching relevant to your subject area?
Are these techniques beneficial for students?
Do you know the specific uses of technology in your discipline?
How you find technological resources specific to discipline?

Like is there any subject which you consider incomplete in teaching or learning if you do not use them?
Enlist technological tools use in your subject area
Suggestions..?

Annexure C: Laboratory Manual Sample for Documentation for Student's Provision

Laboratory Manual for Fundamental of Enzymology
Department of medical lab technology

Course Instructor: Mam Mahnoor
Department: BS MLT
University: PMAS-AAUR-GIMS

Experiment # 01

Introduction of various Medical devices that use Enzymes

1. **Glucose meters:** Use enzymes like glucose oxidase to measure blood glucose levels.
2. **Blood clotting analyzers:** Use enzymes like thromboplastin to measure blood coagulation.
3. **Liver function tests:** Use enzymes like alanine transaminase (ALT) and aspartate transaminase (AST) to measure liver enzyme levels.
4. **Pregnancy tests:** Use enzymes like human chorionic gonadotropin (HCG) to detect pregnancy.
5. **Enzyme-linked immunosorbent assay (ELISA) kits:** Use enzymes like horseradish peroxidase (HRP) to detect various biomarkers.
6. **Point-of-care diagnostic devices:** Use enzymes like lactate dehydrogenase (LDH) to detect diseases like malaria.
7. **Biomedical implants:** Use enzymes like glucose oxidase to power biofuel cells.
8. **Biosensors:** Use enzymes like acetylcholinesterase to detect neurotransmitters.
9. **Drug delivery systems:** Use enzymes like proteases to release drugs in response to specific stimuli.
10. **In vitro diagnostics:** Use enzymes like polymerase to amplify DNA sequences.

These devices use enzymes to detect, measure, or respond to various biomarkers, allowing for accurate diagnoses.

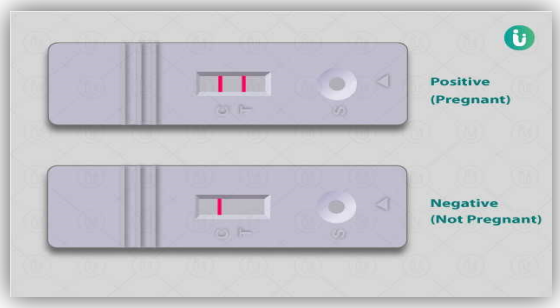
1.Glucose meter

2. Blood clotting analyzer

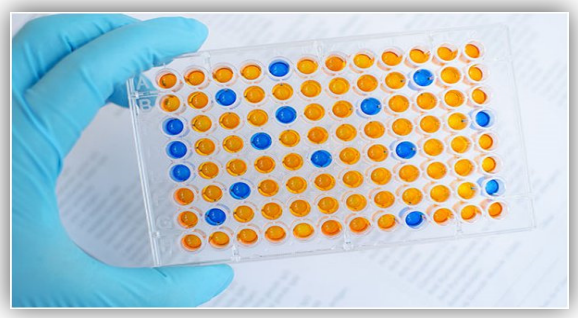
3.

3. LFT

4. Pregnancy test



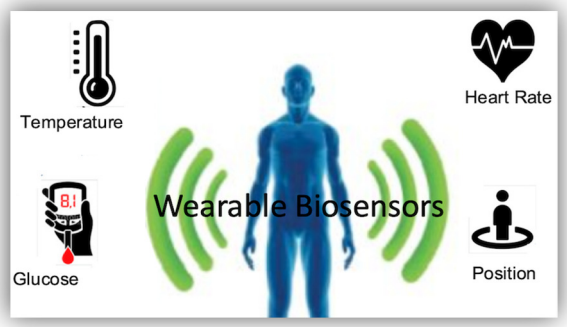
5.ELISA



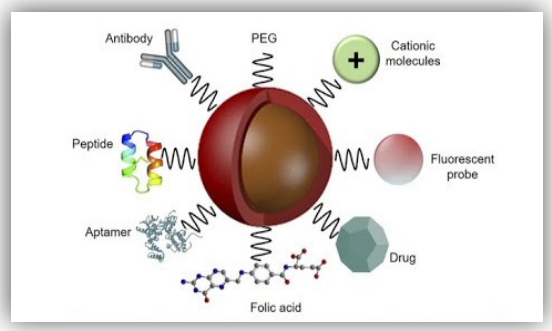
6. POCD

7. Biomedical implants

8. Biosensor



9. DDS



10. In Vitro Diagnosis

Experiment # 02

Extraction of enzymes from plant sample Materials

- ✓ **Fresh leaves of your chosen plant**
- ✓ Mortar and pestle
- ✓ Homogenization buffer (e.g., 50 mM potassium phosphate buffer, pH 7.0) prepared with
- ✓ potassium dihydrogen phosphate (KH_2PO_4) and disodium hydrogen phosphate (Na_2HPO_4)
- ✓ Ice bucket
- ✓ Centrifuge tubes
- ✓ Centrifuge
- ✓ Filtration apparatus (optional)
- ✓ Procedure:

1.Leaf preparation:

- ✓ Wash the leaves thoroughly with distilled water to remove any dirt or debris.

2.Leaf homogenization:

- ✓ Weigh a known amount of leaves (e.g., 0.5 g) and grind them in a chilled mortar and pestle with a pre-chilled volume of homogenization buffer (e.g., 5mL). Maintain a cold temperature throughout the process to minimize enzyme denaturation.

3.Centrifugation:

- ✓ Transfer the homogenate to a centrifuge tube and centrifuge at high speed (e.g., 10,000 rpm) for a specific duration (e.g., 15 minutes) at a low temperature (e.g., 4°C).

This step separates the soluble fraction containing the extracted enzymes from the insoluble cellular debris.

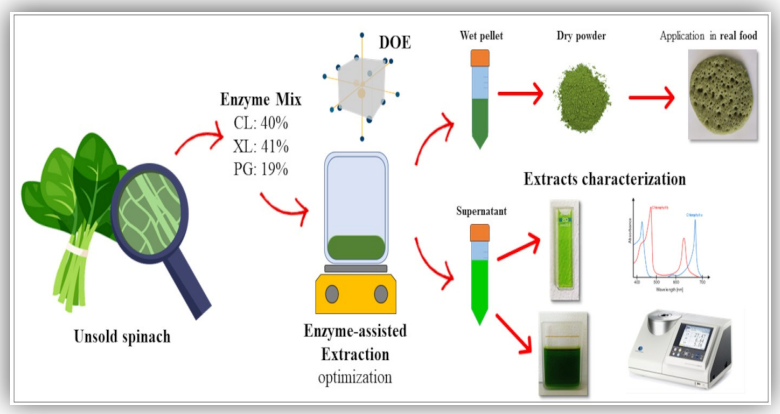
4. Filtration (optional):

If necessary, filter the supernatant using a filter paper or membrane remove any remaining particulates that might interfere with subsequent analyses.

5. Enzyme extract:

The resulting supernatant is your crude enzyme extract, containing various enzymes extracted from the leaves.

Extraction of enzyme from leaves



Experiment # 03
Enzymes estimation of enzymes extracted from plant source

Materials

1. Crude Extract Preparation:

- Grind plant tissue into a fine powder using a mortar and pestle or grinder.
- Mix 1g of powder with 10ml of buffer solution (e.g., phosphate or Tris in a Buffer) in a centrifuge.
- Vortex and centrifuge at 10,000 rpm for 10 minutes.
- Collect the supernatant as the crude extract.

2. Enzyme Assay:

- Prepare a reaction mixture containing the crude extract, substrate, and buffer.
- Incubate at optimal temperature (e.g., 37°C) for a specified time (e.g., 30min)
- Measure the reaction rate by monitoring absorbance changes using a spectrophotometer.

3. Enzyme Activity Calculation:

- Calculate enzyme activity using the formula: Activity (U/mL) = (ΔA/min) x

(Volume of reaction mixture) / (Epsilon x Path length)

Enzyme Extraction:

1. Homogenization:

- Grind plant tissue into a fine powder using a mortar and pestle or grinder.
- Mix 1g of powder with 5-10ml of extraction buffer (e.g., phosphate or Tri buffer) in a blender or homogenizer.
- Blend at high speed for 1-2 minutes.

2. Centrifugation:

- Centrifuge the homogenate at 10,000 rpm for 10-15 minutes.
- Collect the supernatant as the enzyme extract.

3. Purification:

- Use techniques like gel filtration, ion exchange, or affinity chromatography to purify the enzyme.

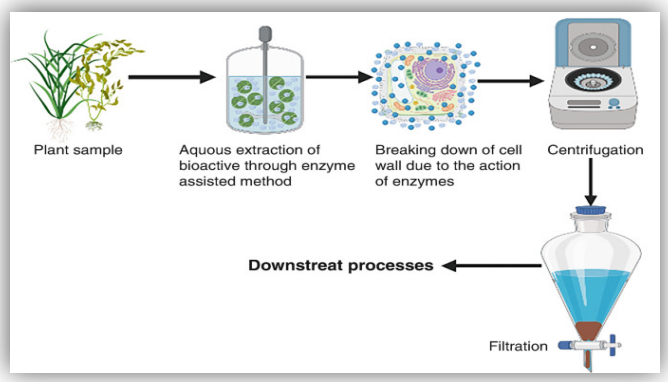
Materials:

- Plant tissue (e.g., leaves, roots, or stems)
- Buffer solutions (e.g., phosphate or Tris buffer)
- Substrate for enzyme assay
- Spectrophotometer
- Centrifuge
- Blender or homogenizer
- Chromatography equipment (optional)

Procedure:

1. Prepare the crude extract and perform the enzyme assay.
2. Calculate enzyme activity and optimize the extraction conditions.
3. Perform large-scale extraction and purification using the optimized conditions.
4. Characterize the purified enzyme using techniques like SDS-PAGE and Western blotting.

Note: The specific materials and procedure may vary depending on the type of enzyme



Estimation of enzymes

Experiment # 4
Acid and starch hydrolysis of glycogen and starch
Acid Hydrolysis

- **Glycogen:**

1. Prepare a 10% glycogen solution in 2M HCl.
2. Heat the mixture at 100°C for 30 minutes.
3. Cool and neutralize with 2M NaOH.
4. Collect the hydrolysate and analyze for glucose using a spectrophotometer or HPLC.

- Starch:

1. Prepare a 10% starch solution in 2M HCl.
2. Heat the mixture at 100°C for 1 hour.
3. Cool and neutralize with 2M NaOH.
4. Collect the hydrolysate and analyze for glucose using a spectrophotometer or HPLC.

.Enzymatic Hydrolysis:

- Glycogen:

1. Prepare a 10% glycogen solution in 0.1M phosphate buffer (pH 7.0).
2. Add 1mg of glycogen phosphorylase (or amyloglucosidase) per mL of solution.
3. Incubate at 37°C for 30 minutes (or 1 hour for complete hydrolysis).
4. Collect the hydrolysate and analyze for glucose using a spectrophotometer.

- Starch:

1. Prepare a 10% starch solution in 0.1M phosphate buffer (pH 7.0).
2. Add 1mg of α-amylase (or glucoamylase) per mL of solution.
3. Incubate at 37°C for 30 minutes (or 1 hour for complete hydrolysis).
4. Collect the hydrolysate and analyze for glucose using a spectrophotometer or HPLC.

Materials:

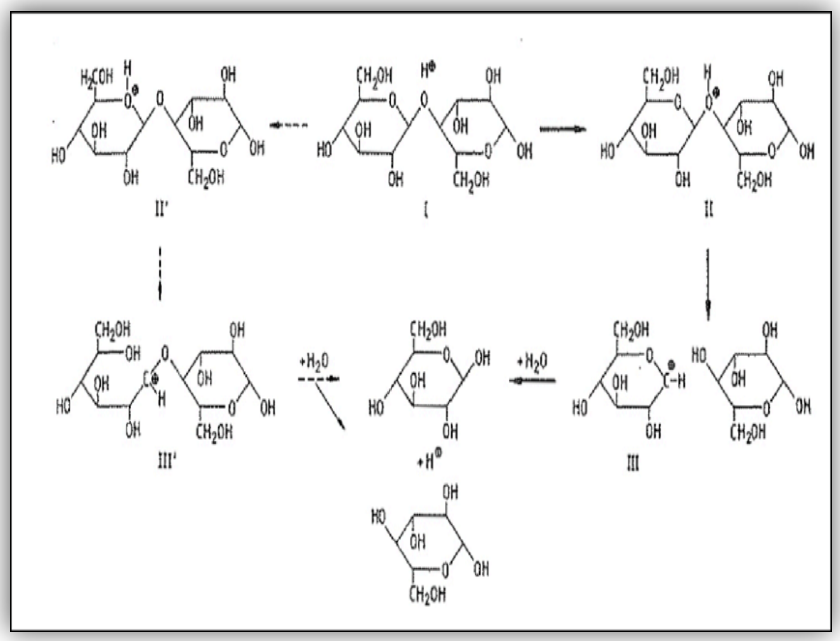
- Glycogen or starch

- HCl (2M)
- NaOH (2M)
- Phosphate buffer (0.1M, pH 7.0)
- Glycogen phosphorylase (or amyloglucosidase)
- α-Amylase (or glucoamylase)
- Spectrophotometer or HPLC
- Water bath or incubator

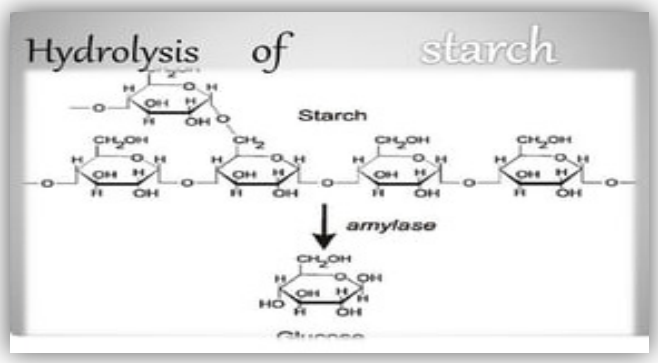
Procedure:

1. Prepare the glycogen or starch solution in the appropriate buffer.
2. Add the acid (HCl) or enzyme (glycogen phosphorylase or α-amylase) to the solution.
3. Incubate at the specified temperature and time.
4. Neutralize the acid hydrolysate with NaOH.
5. Collect the hydrolysate and analyze for glucose.
6. Compare the efficiency of acid and enzymatic hydrolysis.

Note: The specific conditions (temperature, time, enzyme concentration) may vary depending on the type of enzyme and substrate.



Acid Hydrolysis of Glycogen



Acid Hydrolysis of Starch

Practical # 5
Biosynthesis of enzymes by microbes

Microbial Enzyme Production:

- Organism: Bacillus subtilis (or other enzyme-producing microbe)
- Enzyme: Amylase (or other desired enzyme)
- Medium:
- Nutrient broth (NB) or Minimal Medium (MM)
- Carbon source (e.g., starch, glucose)
- Nitrogen source (e.g., peptone, ammonium sulfate)
- pH indicator (e.g., phenol red)

- Equipment:

- Erlenmeyer flasks
- Autoclave
- Incubator
- Centrifuge
- Spectrophotometer

Procedure:

1. Inoculum Preparation:
- Grow B. subtilis in NB or MM overnight at 37°C.
- Harvest cells by centrifugation (5,000 rpm, 5 min).
- Resuspend cells in fresh medium.

2. Enzyme Production:

- Inoculate 100 mL of medium with 1 mL of inoculum.
- Incubate at 37°C, 120 rpm for 24-48 hours.

- Monitor pH and adjust as needed.

3. Enzyme Extraction:

- Centrifuge culture broth (10,000 rpm, 10 min).
- Collect supernatant as crude enzyme extract.

4. Enzyme Assay:

- Measure amylase activity using starch-iodine method or spectrophotometry.

5. Purification:

- Use techniques like gel filtration, ion exchange, or affinity chromatography.

Tips and Variations:

- Optimize medium composition and culture conditions for maximum enzyme production.
- Use different microorganisms or enzymes (e.g., proteases, lipases).
- Add inducers or inhibitors to regulate enzyme production.
- Scale up or down depending on experimental needs.

Safety Precautions:

- Handle microorganisms and chemicals with appropriate precautions.
- Autoclave equipment and materials before disposal.

By following this practical guide, you can produce and extract enzymes from microbes.

Biosynthesis of enzymes from microbes

Practical # 6
Effect of pH on enzyme activity

Materials:

- Enzyme solution (e.g., amylase, protease, or lipase)
- Buffer solutions with different pH values (e.g., pH 3-10)
- Substrate solution (e.g., starch, protein, or lipid)

Spectrophotometer or colorimeter

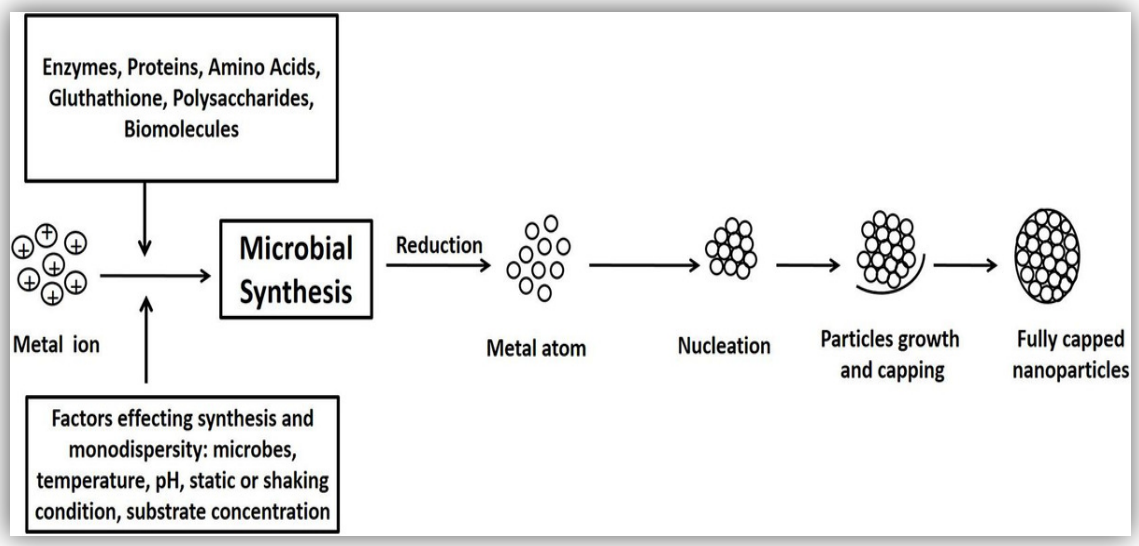
Cuvettes or tubes

pipetttes

Procedure:

1. Prepare Enzyme and Substrate Solutions:

- Dilute the enzyme solution to a suitable concentration.



- Prepare the substrate solution according to the enzyme's requirements.

2. Prepare Buffer Solutions:

- Prepare buffer solutions with different pH values (e.g., pH 3, 5, 7, 9, and 10).

3. Assay Enzyme Activity:

- Mix a fixed amount of enzyme solution with a fixed amount of substrate solution in a cuvette or tube.
- Add a fixed amount of buffer solution with a specific pH to the mixture.
- Incubate the mixture at a suitable temperature (e.g., 37°C) for a fixed time (e.g., 10-30 minutes).
- Measure the absorbance or color intensity using a spectrophotometer or colorimeter.

4. Repeat Assays at Different pH Values:

- Repeat step 3 with different buffer solutions, each with a different pH value.

5. Plot Enzyme Activity vs. pH:

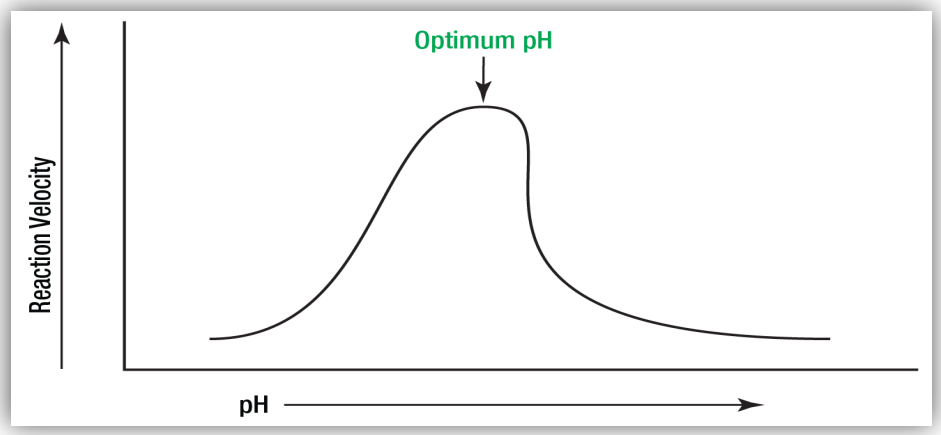
- Plot the enzyme activity (absorbance or color intensity) against the corresponding pH value.
- Observe the effect of pH on enzyme activity and determine the optimal pH range for the enzyme.

Tips and Variations:

- Use a pH indicator (e.g., phenol red) to visualize the pH change.
- Use different enzymes or substrates to investigate their specific pH optima.

- Investigate the effect of pH on enzyme stability by incubating the enzyme at different pH values for an extended period.

-



Practical # 7
Effect of temperature on enzymes activity

Materials:

- Enzyme solution (e.g., amylase, protease, or lipase)
- Substrate solution (e.g., starch, protein, or lipid)
- Thermometer
- Water bath or temperature-controlled incubator
- Spectrophotometer or colorimeter
- Cuvettes or tubes
- Pipettes

Procedure:

1. Prepare Enzyme and Substrate Solutions:

- Dilute the enzyme solution to a suitable concentration.
- Prepare the substrate solution according to the enzyme's requirements.

2. Set Up Temperature Range:

- Prepare water baths or temperature-controlled incubators at different temperatures (e.g., 20°C, 30°C, 40°C, 50°C, and 60°C).

3. Assay Enzyme Activity:

- Mix a fixed amount of enzyme solution with a fixed amount of substrate solution in a cuvette or tube.
- Place the mixture in the water bath or incubator at a specific temperature.
- Incubate for a fixed time (e.g., 10-30 minutes)
- Measure the absorbance or color intensity using a spectrophotometer or colorimeter.

4. Repeat Assays at Different Temperatures:

- Repeat step 3 at each temperature point.

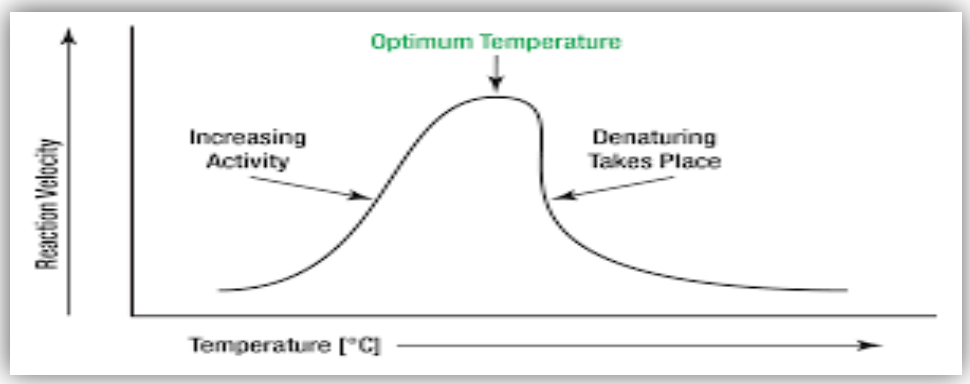
5. Plot Enzyme Activity vs. Temperature:

- Plot the enzyme activity (absorbance or color intensity) against the corresponding temperature.
- Observe the effect of temperature on enzyme activity and determine the optimal temperature range for the enzyme.

Tips and Variations:

- Use a temperature control device to maintain precise temperatures.
- Investigate the effect of temperature on enzyme stability by incubating the enzyme at different temperatures for an extended period.
- Study the effect of temperature on different enzymes or substrates.

-



Practical # 8
Effect of substrate concentration on enzymes activity

Materials:

- Enzyme solution (e.g., amylase, protease, or lipase)
- Substrate solution (e.g., starch, protein, or lipid)
- Thermometer
- Water bath or temperature-controlled incubator
- Spectrophotometer or colorimeter
- Cuvettes or tubes
- Pipettes

Procedure:

1. Prepare Enzyme and Substrate Solutions:

- Dilute the enzyme solution to a suitable concentration.
- Prepare the substrate solution according to the enzyme's requirements.

2. Set Up Temperature Range:

- Prepare water baths or temperature-controlled incubators at different temperatures (e.g., 20°C, 30°C, 40°C, 50°C, and 60°C).

3. Assay Enzyme Activity:

- Mix a fixed amount of enzyme solution with a fixed amount of substrate solution in a cuvette or tube.
- Place the mixture in the water bath or incubator at a specific temperature.
- Incubate for a fixed time (e.g., 10-30 minutes).

- Measure the absorbance or color intensity using a spectrophotometer or colorimeter.

4. Repeat Assays at Different Temperatures:

- Repeat step 3 at each temperature point.

5. Plot Enzyme Activity vs. Temperature:

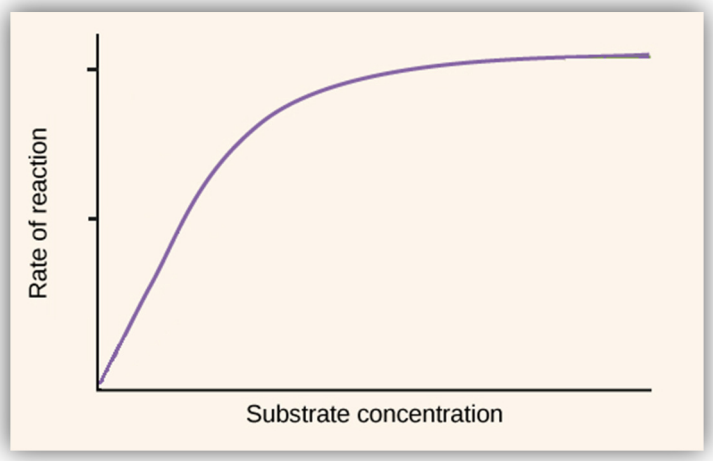
- Plot the enzyme activity (absorbance or color intensity) against the corresponding temperature.

- Observe the effect of temperature on enzyme activity and determine the optimal temperature range for the enzyme.

Tips and Variations:

- Use a temperature control device to maintain precise temperatures.
- Investigate the effect of temperature on enzyme stability by incubating the enzyme at different temperatures for an extended period.
- Study the effect of temperature on different enzymes or substrates.

-



Practical # 9
Effect of enzymes concentration on enzymes activity

Materials:

- Enzyme solution (e.g., amylase, protease, or lipase)
- Substrate solution (e.g., starch, protein, or lipid)
- Thermometer
- Water bath or temperature-controlled incubator
- Spectrophotometer or colorimeter
- Cuvettes or tubes
- Pipettes

Procedure:

1. Prepare Enzyme and Substrate Solutions:

- Dilute the enzyme solution to a suitable concentration.
- Prepare the substrate solution according to the enzyme's requirements.

2. Set Up Temperature Range:

- Prepare water baths or temperature-controlled incubators at different temperatures (e.g., 20°C, 30°C, 40°C, 50°C, and 60°C).

3. Assay Enzyme Activity:

- Mix a fixed amount of enzyme solution with a fixed amount of substrate solution in a cuvette or tube.
- Place the mixture in the water bath or incubator at a specific temperature.
- Incubate for a fixed time (e.g., 10-30 minutes).
- Measure the absorbance or color intensity using a spectrophotometer or colorimeter.

4. Repeat Assays at Different Temperatures:

- Repeat step 3 at each temperature point.

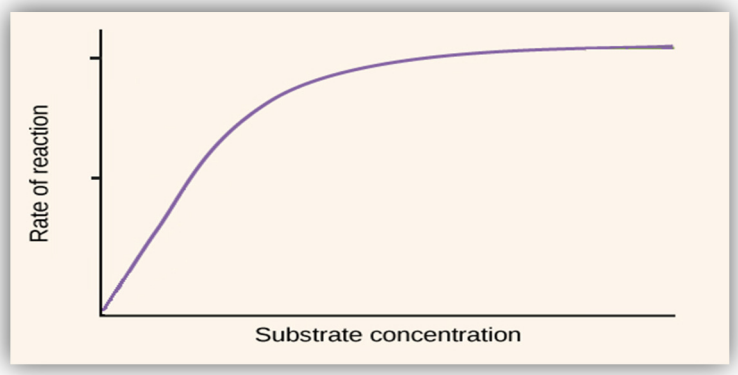
5. Plot Enzyme Activity vs. Temperature:

- Plot the enzyme activity (absorbance or color intensity) against the corresponding temperature.

- Observe the effect of temperature on enzyme activity and determine the optimal temperature range for the enzyme.

Tips and Variations:

- Use a temperature control device to maintain precise temperatures.
- Investigate the effect of temperature on enzyme stability by incubating the enzyme at different temperatures for an extended period.
- Study the effect of temperature on different enzymes or substrates.
-



Practical # 10
Effect of heat stability on enzymes activity

Materials:

- Enzyme solution (e.g., amylase, protease, or lipase)
- Substrate solution (e.g., starch, protein, or lipid)
- Thermometer
- Water bath or temperature-controlled incubator
- Spectrophotometer or colorimeter
- Cuvettes or tubes
- Pipettes

Procedure:

1. Prepare Enzyme and Substrate Solutions:

- Dilute the enzyme solution to a suitable concentration.
- Prepare the substrate solution according to the enzyme's requirements.

2. Set Up Temperature Range:

- Prepare water baths or temperature-controlled incubators at different temperatures (e.g., 20°C, 30°C, 40°C, 50°C, and 60°C).

3. Assay Enzyme Activity:

- Mix a fixed amount of enzyme solution with a fixed amount of substrate solution in a cuvette or tube.
- Place the mixture in the water bath or incubator at a specific temperature.
- Incubate for a fixed time (e.g., 10-30 minutes).
- Measure the absorbance or color intensity using a spectrophotometer or colorimeter.

4. Repeat Assays at Different Temperatures:

- Repeat step 3 at each temperature point.

5. Plot Enzyme Activity vs. Temperature:

- Plot the enzyme activity (absorbance or color intensity) against the corresponding temperature.
- Observe the effect of temperature on enzyme activity and determine the optimal temperature range for the enzyme.

Tips and Variations:

- Use a temperature control device to maintain precise temperatures.
- Investigate the effect of temperature on enzyme stability by incubating the enzyme at different temperatures for an extended period.
- Study the effect of temperature on different enzymes or substrates.

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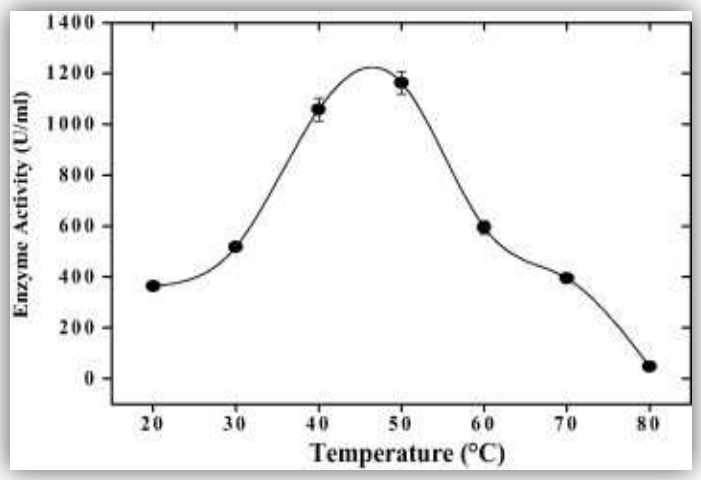

References:

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- Eisenthal, R., & Danson, M. J. (2019). Enzyme Assays: Essential Methods. Wiley-Blackwell.
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- Kamin, A. A. (2017). Enzyme Assays: A Practical Approach. Taylor & Francis.
- Enzymes: Catalysis, Kinetics, and Mechanisms by N.S. Punekar (2018)
- Enzymology Lab Manual by KSU

- Enzyme Student Manual by Western UK
- Experiments in the Purification and Characterization of Enzymes: A Laboratory Manual
- BCH 322 Enzymology Lab Course Outline by KSU
- Enzymes by Lumen Learning

Annexure D: Teacher and Course Evaluation

Instructor Name: Mr Usman Amjed
Course: QR-401 Quantitative Reasoning-I
The student shows the positive response towards instructor which showcase the student's satisfaction towards teacher. The 88% and 13% were strongly agreed and agreed respectively The Instructor shows respect towards students and encourages class participation

Teacher Evaluation Summary					
S. A:(Strongly Agree) A:(Agree) UC:(Uncertain) D:(Disagree) S. D:(Strongly Disagree)					
Description	**S.A**	**A**	**UC**	**D**	**S.D**
The Instructor is prepared for each class.	100%	0%	0%	0%	0%
The Instructor demonstrates knowledge of the subject.	100%	0%	0%	0%	0%
The Instructor has completed the whole course.	100%	0%	0%	0%	0%
The Instructor provides additional material apart from the textbook.	100%	0%	0%	0%	0%
The Instructor gives citations regarding current situations with reference to Pakistani context.	88%	13%	0%	0%	0%
The Instructor communicates the subject matter effectively.	100%	0%	0%	0%	0%
The Instructor shows respect towards students and encourages class participation	100%	0%	0%	0%	0%
The Instructor maintains an environment that is conducive to learning.	100%	0%	0%	0%	0%
The Instructor arrives on time.	100%	0%	0%	0%	0%
The Instructor leaves on time.	100%	0%	0%	0%	0%
The instructor has completed all classes regularly.	100%	0%	0%	0%	0%
The instructor posts the assignments/quizzes on time and give reasonable time to complete the assigned assignments/quizzes.	88%	13%	0%	0%	0%
The Subject matter presented in the course has increased your knowledge of the subject.	100%	0%	0%	0%	0%
The Instructor was available during the specified hours on office and after class for consultations.	100%	0%	0%	0%	0%
The course integrates theoretical course concepts with real-world applications.	100%	0%	0%	0%	0%
The assignments and exams covered the materials presented in the course.	100%	0%	0%	0%	0%
The course material is modern and updated	100%	0%	0%	0%	0%
The teacher is fair in exams.	100%	0%	0%	0%	0%

Instructor Name: Ms Naumana Kanwal

Course: ENG-302 Communication Skills

The student shows the positive response towards instructor which showcase the student's satisfaction towards teacher. The 86% and 10% were strongly agreed and agreed respectively that instructor was available during the specified office hours and for after class consultations.

Teacher Evaluation Summary					
S. A:(Strongly Agree) A:(Agree) UC:(Uncertain) D:(Disagree) S. D:(Strongly Disagree)					
Description	**S.A**	**A**	**UC**	**D**	**S.D**
The Instructor is prepared for each class.	86%	10%	0%	0%	5%
The Instructor demonstrates knowledge of the subject.	86%	10%	0%	0%	5%
The Instructor has completed the whole course.	86%	10%	0%	0%	5%
The Instructor provides additional material apart from the textbook.	86%	10%	0%	0%	5%
The Instructor gives citations regarding current situations with reference to Pakistani context.	86%	10%	0%	0%	5%
The Instructor communicates the subject matter effectively.	86%	10%	0%	0%	5%
The Instructor shows respect towards students and encourages class participation	86%	10%	0%	0%	5%
The Instructor maintains an environment that is conducive to learning.	90%	5%	0%	0%	5%
The Instructor arrives on time.	90%	5%	0%	0%	5%
The Instructor leaves on time.	86%	10%	0%	0%	5%
The instructor has completed all classes regularly.	90%	5%	0%	0%	5%
The instructor posts the assignments/quizzes on time and give reasonable time to complete the assigned assignments/quizzes.	90%	5%	0%	0%	5%
The Subject matter presented in the course has increased your knowledge of the subject.	90%	5%	0%	0%	5%
The Instructor was available during the specified hours on office and after class for consultations.	86%	10%	0%	0%	5%
The course integrates theoretical course concepts with real-world applications.	86%	10%	0%	0%	5%
The assignments and exams covered the materials presented in the course.	86%	10%	0%	0%	5%
The course material is modern and updated	81%	14%	0%	0%	5%
The teacher is fair in exams.	86%	10%	0%	0%	5%

Instructor Name: Ms Saira Anwar Bajwa

Course: SSH-301 Pakistan Studies

The student shows the positive response towards instructor which showcase the student's satisfaction towards teacher. The 86% and 10% were strongly agreed and agreed respectively that instructor was available during the specified office hours and for after class consultations.

Teacher Evaluation Summary					
S. A:(Strongly Agree) A:(Agree) UC:(Uncertain) D:(Disagree) S. D:(Strongly Disagree)					
Description	**S.A**	**A**	**UC**	**D**	**S.D**
The Instructor is prepared for each class.	86%	10%	0%	0%	5%
The Instructor demonstrates knowledge of the subject.	86%	10%	0%	0%	5%
The Instructor has completed the whole course.	86%	10%	0%	0%	5%
The Instructor provides additional material apart from the textbook.	86%	10%	0%	0%	5%
The Instructor gives citations regarding current situations with reference to Pakistani context.	86%	10%	0%	0%	5%
The Instructor communicates the subject matter effectively.	86%	10%	0%	0%	5%
The Instructor shows respect towards students and encourages class participation	86%	10%	0%	0%	5%
The Instructor maintains an environment that is conducive to learning.	90%	5%	0%	0%	5%
The Instructor arrives on time.	90%	5%	0%	0%	5%
The Instructor leaves on time.	86%	10%	0%	0%	5%
The instructor has completed all classes regularly.	90%	5%	0%	0%	5%
The instructor posts the assignments/quizzes on time and give reasonable time to complete the assigned assignments/quizzes.	90%	5%	0%	0%	5%
The Subject matter presented in the course has increased your knowledge of the subject.	90%	5%	0%	0%	5%
The Instructor was available during the specified hours on office and after class for consultations.	86%	10%	0%	0%	5%
The course integrates theoretical course concepts with real-world applications.	86%	10%	0%	0%	5%
The assignments and exams covered the materials presented in the course.	86%	10%	0%	0%	5%
The course material is modern and updated	81%	14%	0%	0%	5%

Instructor Name: Mr Syed Shahzaib Noshahi
Course: TOQ-301 Translation of Quran
The student shows the positive response towards instructor which showcase the student's satisfaction towards teacher. The 80% and 20% were strongly agreed and agreed respectively the course integrates theoretical course concepts with real-world applications.

Teacher Evaluation Summary					
S. A:(Strongly Agree) A:(Agree) UC:(Uncertain) D:(Disagree) S. D:(Strongly Disagree)					
Description	**S.A**	**A**	**UC**	**D**	**S.D**
The Instructor is prepared for each class.	80%	20%	0%	0%	0%
The Instructor demonstrates knowledge of the subject.	80%	20%	0%	0%	0%
The Instructor has completed the whole course.	80%	20%	0%	0%	0%
The Instructor provides additional material apart from the textbook.	80%	20%	0%	0%	0%
The Instructor gives citations regarding current situations with reference to Pakistani context.	80%	20%	0%	0%	0%
The Instructor communicates the subject matter effectively.	80%	20%	0%	0%	0%
The Instructor shows respect towards students and encourages class participation	100%	0%	0%	0%	0%
The Instructor maintains an environment that is conducive to learning.	100%	0%	0%	0%	0%
The Instructor arrives on time.	100%	0%	0%	0%	0%
The Instructor leaves on time.	80%	20%	0%	0%	0%
The instructor has completed all classes regularly.	100%	0%	0%	0%	0%
The instructor posts the assignments/quizzes on time and give reasonable time to complete the assigned assignments/quizzes.	80%	20%	0%	0%	0%
The Subject matter presented in the course has increased your knowledge of the subject.	100%	0%	0%	0%	0%
The Instructor was available during the specified hours on office and after class for consultations.	80%	20%	0%	0%	0%
The course integrates theoretical course concepts with real-world applications.	100%	0%	0%	0%	0%
The assignments and exams covered the materials presented in the course.	100%	0%	0%	0%	0%
The course material is modern and updated	100%	0%	0%	0%	0%

The teacher is fair in exams.	80%	20%	0%	0%	0%

Instructor Name: Mr Usman Adress
Course: MLT-304 Quality assurance and Lab Management Tools
The student's response has been observed satisfactory about the completion of course, demonstration and about the provision of additional course material. Almost all students were strongly agreed teacher integrates theoretical course concepts with real-world applications and maintains an environment that is conducive to learning.

Course Evaluation Summary					
S. A:(Strongly Agree) A:(Agree) UC:(Uncertain) D:(Disagree) S. D:(Strongly Disagree)					
Description	**S.A**	**A**	**UC**	**D**	**S.D**
The course objectives were clear.	75%	25%	0%	0%	0%
The Course workload was manageable.	50%	25%	25%	0%	0%
The Course was well organized (e.g. timely access to materials, notification of changes, etc.).	75%	25%	0%	0%	0%
Approximate level of your own attendance during the whole Course	75%	0%	25%	0%	0%
I participated actively in the Course	100%	0%	0%	0%	0%
I think I have made progress in this Course	50%	50%	0%	0%	0%
I think the Course was well structured to achieve the learning outcomes (there was a good balance of lectures, tutorials, practical etc.)	50%	0%	25%	25%	0%
The learning and teaching methods encouraged participation.	75%	0%	25%	0%	0%
The overall environment in the class was conducive to learning.	50%	25%	25%	0%	0%
Learning materials (Lesson Plans, Course Notes etc.) were relevant and useful.	100%	0%	0%	0%	0%
The provision of learning resources in the library was adequate and appropriate	50%	0%	25%	25%	0%
The provision of learning resources on the Web was adequate and appropriate (if relevant)	50%	0%	25%	25%	0%
The Course stimulated my interest and thought on the subject area.	50%	25%	0%	25%	0%
The pace of the Course was appropriate.	75%	25%	0%	0%	0%
Ideas and concepts were presented clearly.	75%	0%	0%	25%	0%
The method of assessment were reasonable.	75%	0%	25%	0%	0%
Feedback on assessment was timely and helpful.	75%	0%	25%	0%	0%
The instructor was responsive to student needs and problems	50%	25%	25%	0%	0%
The material in the tutorials was useful and well organized.	75%	25%	0%	0%	0%

I was happy with the amount of work needed for tutorials.	75%	0%	25%	0%	0%
The tutor dealt effectively with my problems.	75%	0%	25%	0%	0%
	Full Time	Part-Time			
Full/part time study:	100%	0%			
	Yes	NO			
Do you consider yourself to be disabled:	0%	100%			
	Gujrat	Other			
Domicile:	100%	0%			
	Male	Female			
Gender:	50%	50%			
	Less	22-29	Over		

Instructor Name: **Mr Dr Habib Ur Rehaman**

Course: MLT-307 Anatomy & Physiology-I

The student's response has been observed satisfactory about the completion of course, demonstration and about the provision of additional course material. The 92% were strongly. All students were strongly agreed teacher integrates theoretical course concepts with real-world applications and maintains an environment that is conducive to learning.

Course Evaluation Summary					
S. A:(Strongly Agree) A:(Agree) UC:(Uncertain) D:(Disagree) S. D:(Strongly Disagree)					
Description	**S.A**	**A**	**UC**	**D**	**S.D**
The course objectives were clear.	92%	8%	0%	0%	0%
The Course workload was manageable.	83%	17%	0%	0%	0%
The Course was well organized (e.g. timely access to materials, notification of changes, etc.).	92%	8%	0%	0%	0%
Approximate level of your own attendance during the whole Course	92%	8%	0%	0%	0%
I participated actively in the Course	92%	8%	0%	0%	0%
I think I have made progress in this Course	92%	8%	0%	0%	0%
I think the Course was well structured to achieve the learning outcomes (there was a good balance of lectures, tutorials, practical etc.)	92%	8%	0%	0%	0%
The learning and teaching methods encouraged participation.	83%	17%	0%	0%	0%
The overall environment in the class was conducive to learning.	92%	8%	0%	0%	0%
Learning materials (Lesson Plans, Course Notes etc.) were relevant and useful.	92%	8%	0%	0%	0%
The provision of learning resources in the library was adequate and appropriate	92%	8%	0%	0%	0%
The provision of learning resources on the Web was adequate and appropriate (if relevant)	92%	8%	0%	0%	0%
The Course stimulated my interest and thought on the subject area.	92%	8%	0%	0%	0%
The pace of the Course was appropriate.	92%	8%	0%	0%	0%
Ideas and concepts were presented clearly.	92%	8%	0%	0%	0%
The method of assessment were reasonable.	92%	8%	0%	0%	0%
Feedback on assessment was timely and helpful.	83%	17%	0%	0%	0%
The instructor was responsive to student needs and problems	92%	8%	0%	0%	0%

The material in the tutorials was useful and well organized.	92%	8%	0%	0%	0%
I was happy with the amount of work needed for tutorials.	92%	8%	0%	0%	0%
The tutor dealt effectively with my problems.	92%	8%	0%	0%	0%
	Full Time	Part-Time			
Full/part time study:	100%	0%			

Annexure E : Teacher Feedback on Teacher and Course Evaluation

Performa 10/1: Teacher & Course Evaluation Feedback

Fall-2023

S. no	Instructor Name	Courses	Class	Remarks
5	Mr Mirza Bahashat Baig	IS-302 Islamic Studies/Ethics	BBA(1st) BBA(2nd) BS-CS(9th)	A
		IS-401 Islamic Studies Class:	BS HND(3) MLT(3)	A
		TOQ-401 Translation Of Quran-II	BBA(3rd BBA(5th) BS MLT(3)	A

Note: write your remarks as per the instructions i.e.

S.A:(Strongly Agree) **A**:(Agree) **UC**:(Uncertain) **D**:(Disagree) **S.D**:(Strongly Disagree)

Feedback:

NIL

Mention area of improvement:

Please give your suggestions for academic improvements:

Maria Ashraf

Head QED | Maria Ashraf

Bahashat

Signature

Date:-Feb 29th,2024.

Performa 10/1: Teacher & Course Evaluation Feedback

Fall-2023

S. no	Instructor Name	Courses	Class	Remarks
12	Dr Zartash Zahra	MLT-401 Clinical Biochemistry	BS MLT(3)	A
		HND-410 Food Microbiology	BS HND (4)	A
		BIOT-503 Biosafety and Bioethics	BS BIOTECH(5)	A
		HND-509 Clinical Biochemistry	BS HND (5)	A

Note: write your remarks as per the instructions i.e.

S.A:(Strongly Agree) **A**:(Agree) **UC**:(Uncertain) **D**:(Disagree) **S.D**:(Strongly Disagree)

Feedback:

Mention area of improvement:

More time required for some of partial applications of the courses.

Please give your suggestions for academic improvements:

Need collaboration with hospital for better partial skills.

Maria Ashraf

Head QED | Maria Ashraf

Zartash

Signature

Date: March,7th 2024.

Performa 10/1: Teacher & Course Evaluation Feedback

Fall-2023

S. no	Instructor Name	Courses	Class	Remarks
14	Ms. Naumana Kanwal	MGT-404 Communication Skills	BBA(2nd)	A
		ENG-302 Communication Skills	BS MLT(3)	A
		ENG-301 Functional English	BS (HND)(1)	A
		ENG-301 Functional English	BS MLT(1)	A

Note: write your remarks as per the instructions i.e.

S.A:(Strongly Agree) **A**:(Agree) **UC**:(Uncertain) **D**:(Disagree) **S.D**:(Strongly Disagree)

Feedback:

Mention area of improvement:

N/A

Please give your suggestions for academic improvements:

Maria Ashraf

Head QED | Maria Ashraf

Naumana

Signature

Date: March,7th 2024.

Performa 10/1: Teacher & Course Evaluation Feedback

Fall-2023

S. no	Instructor Name	Courses	Class	Remarks
17	Mr. Usman Adress	MLT-302 Phlebotomy	BS-MLT(1)	A
		MIC-311 Medical Microbiology	BS-MLT(1)	A
		MLT-404 Laboratory Instrumentation and Techniques	BS-MLT(3)	A
		MLT-402 Bacteriology and Parasitology	BS-MLT(3)	A

Note: write your remarks as per the instructions i.e.

S.A:(Strongly Agree) **A**:(Agree) **UC**:(Uncertain) **D**:(Disagree) **S.D**:(Strongly Disagree)

Feedback:

Mention area of improvement:

kindly add hospital rotation and hire some technical person for lab.

Please give your suggestions for academic improvements:

Provide multimedia.

Maria Ashraf

Head QED I Maria Ashraf

Usman Adrees

Signature

Date: March,7th 2024.

Performa 10/1: Teacher & Course Evaluation Feedback

Fall-2023

S. no	Instructor Name	Courses	Class	Remarks
19	Mr. Usman Amjad	QR-401 Quantitative Reasoning-I	BS MLT(1)	SA
		QR-401 Quantitative Reasoning -1	BBA(1st)	SA
		CS-572 Numerical Analysis	BS-CS(5th)	D
		SE-442 Formal Methods in Software Engineering	BS-SE(5)	SA

Note: write your remarks as per the instructions i.e.

S.A:(Strongly Agree) **A**:(Agree) **UC**:(Uncertain) **D**:(Disagree) **S.D**:(Strongly Disagree)

Feedback:

Mention area of improvement:

Improve coordination between coordinators and lecturer.

Please give your suggestions for academic improvements:

Books required for new courses .

Maria Ashraf

Head QED | Maria Ashraf

Usman Amjad

Signature

Date: March,7th 2024.

Annexure F: Faculty Survey

Performa: 5 Faculty Survey Report (Spring 2022)

Department of Sciences

S.no	Statements	VS	SA	UC	DS	VD
1	Your mix of research teaching and community service	60%	40%	0%	0%	0%
2	The intellectual stimulation of your work	80%	20%	0%	0%	0%
3	Type of teaching / research you currently do	60%	40%	0%	0%	0%
4	Your interaction with students	40%	60%	0%	0%	25%
5	Cooperation you receive form colleagues	60%	40%	0%	0%	0%
6	The mentoring (guidance) available to you	20%	60%	20%	0%	0%
7	Administrative support from the department	20%	60%	20%	0%	0%
8	Providing clarity about the faculty promotion process	0%	60%	40%	25%	0%
9	Your prospects for advancement and progress through ranks	0%	80%	20%	0%	0%
10	Salary and compensation package	0%	20%	60%	20%	0%
11	Job security and stability at the department	100%	0%	0%	0%	0%
12	Amount of time you have for yourself and family	0%	40%	40%	20%	0%
13	The overall climate at the department	20%	80%	0%	0%	0%
14	Whether the department is utilizing your experience and knowledge	100%	0%	0%	0%	0%

VS: Very Satisfied SA: Satisfied UC: Uncertain DS: Dissatisfied VD: Very Dissatisfied

Performa: 5 Faculty Survey Report (Spring 2023)

Department of Sciences

S.no	Statements	VS	SA	UC	DS	VD
1	Your mix of research teaching and community service	12.5%	75%	0%	12.5%	0%
2	The intellectual stimulation of your work	25%	62.5%	0%	12.5%	0%
3	Type of teaching / research you currently do	12.5%	75%	0%	12.5%	0%
4	Your interaction with students	37.5%	50%	0%	12.5%	25%
5	Cooperation you receive form colleagues	25%	50%	12.5%	12.5%	0%
6	The mentoring (guidance) available to you	12.5%	87.5%	0%	0%	0%
7	Administrative support from the department	25%	62.5%	0%	12.5%	0%
8	Providing clarity about the faculty promotion process	0%	50%	25%	12.5%	12.5%
9	Your prospects for advancement and progress through ranks	0%	62.5%	12.5%	25%	0%
10	Salary and compensation package	0%	62.5%	25%	12.5%	0%
11	Job security and stability at the department	0%	75%	25%	0%	0%
12	Amount of time you have for yourself and family	0%	50%	50%	0%	0%
13	The overall climate at the department	25%	75%	0%	0%	0%
14	Whether the department is utilizing your experience and knowledge	0%	75%	12.5%	12.5%	0%

VS: Very Satisfied SA: Satisfied UC: Uncertain DS: Dissatisfied VD: Very Dissatisfied

Performa: 5 Faculty Survey Report (Fall 2023)

Department of Sciences

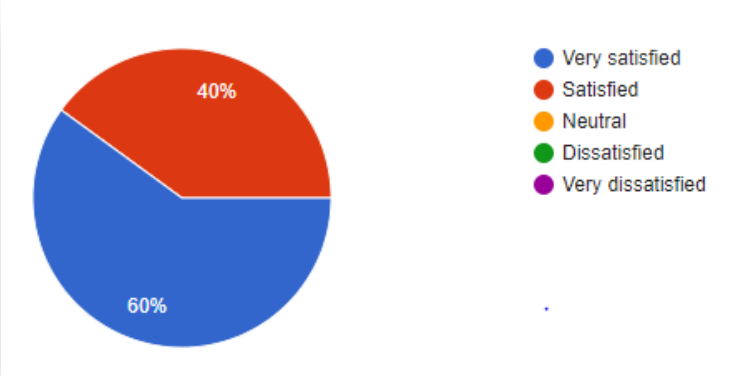
S.no	Statements	VS	SA	UC	DS	VD
1	Your mix of research teaching and community service	14.3%	85.7%	0%	0%	0%
2	The intellectual stimulation of your work	14.3%	85.7%	0%	0%	0%
3	Type of teaching / research you currently do	14.3%	85.7%	0%	0%	0%
4	Your interaction with students	42.9%	42.9%	0%	0%	14.3%
5	Cooperation you receive form colleagues	28.6%	71.4%	0%	0%	0%
6	The mentoring (guidance) available to you	42.9%	57.1%	0%	0%	0%
7	Administrative support from the department	42.9%	57.1%	0%	12.5%	0%
8	Providing clarity about the faculty promotion process	14.3%	42.9%	42.9%	0%	0%
9	Your prospects for advancement and progress through ranks	14.3%	57.1%	28.6%	0%	0%
10	Salary and compensation package	0%	85.7%	14.3%	0%	0%
11	Job security and stability at the department	0%	57.1%	42.9%	0%	0%
12	Amount of time you have for yourself and family	0%	71.4%	14.3%	14.3%	0%
13	The overall climate at the department	28.6%	71.4%	0%	0%	0%
14	Whether the department is utilizing your experience and knowledge	14.3%	85.7%	12.5%	12.5%	0%

VS: Very Satisfied SA: Satisfied UC: Uncertain DS: Dissatisfied VD: Very Dissatisfied

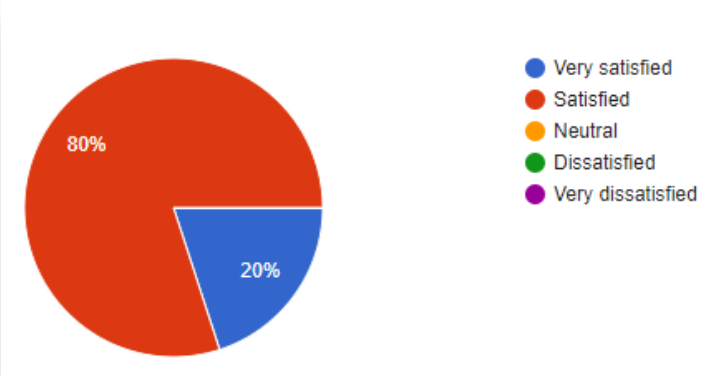
Performa: 5 Faculty Survey Report (Spring 2022)

Department of Sciences

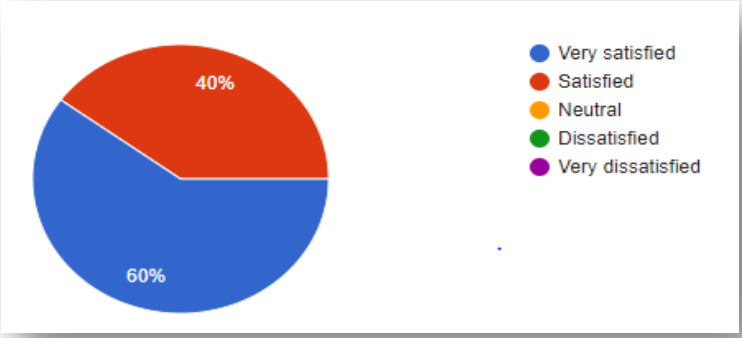
1. Your mix of research teaching and community service.



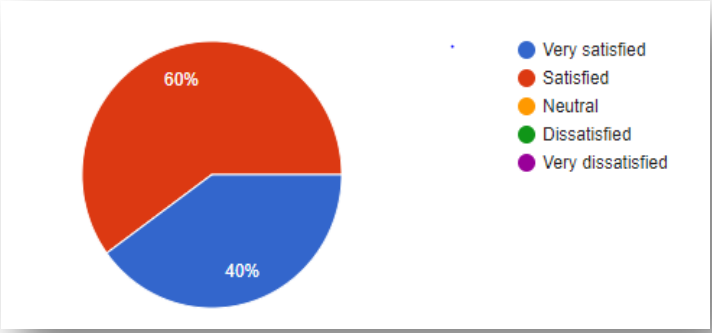
2. The intellectual stimulation of your work.



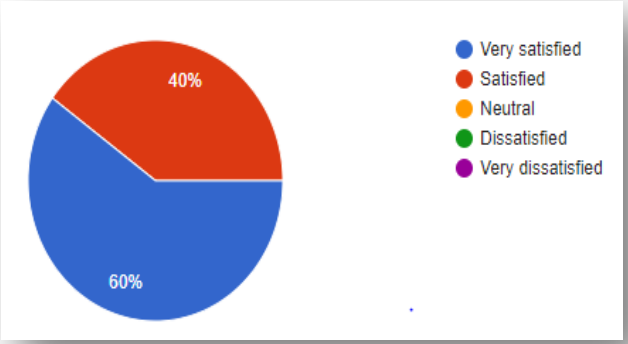
3. Type of teaching / research you currently doing.



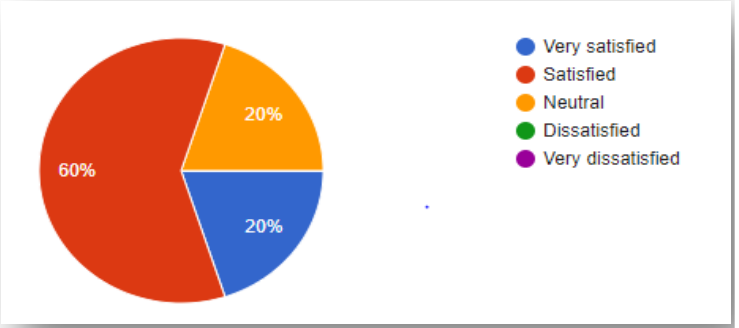
4. Your interaction with students.



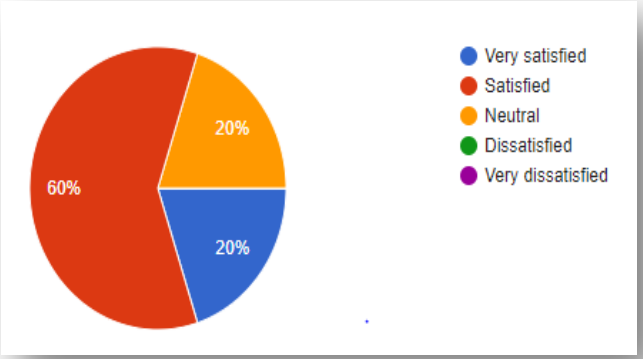
5. Cooperation you receive form colleagues.



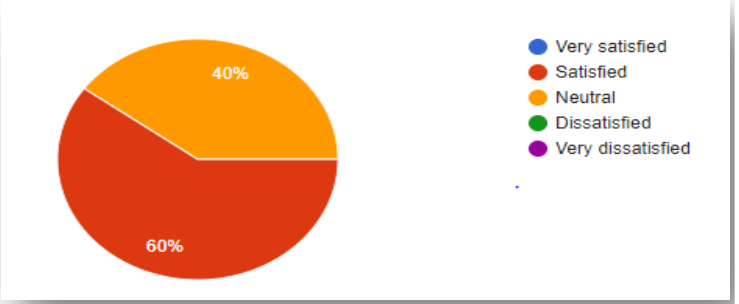
6. The mentoring (guidance) available to you.



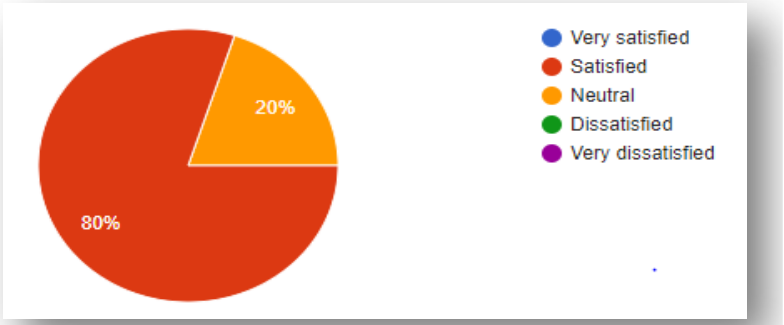
7. Administrative support from the department.



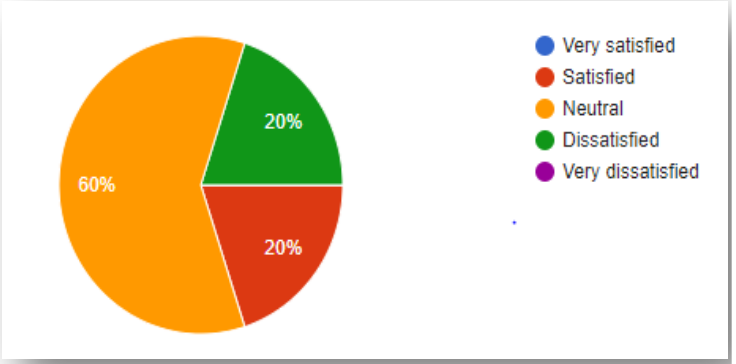
8. Providing clarity about the faculty promotion process.



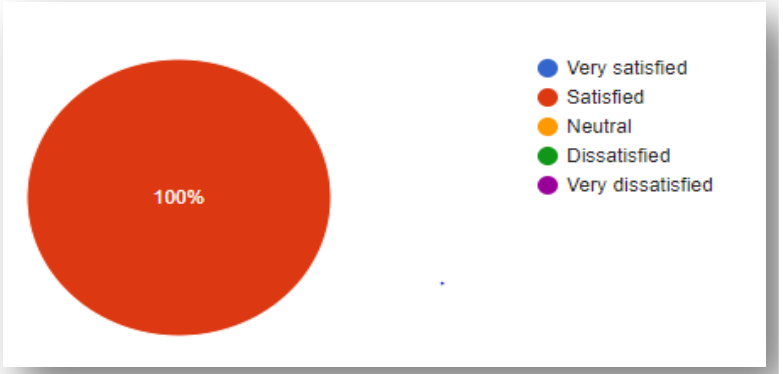
9. Your prospects for advancement and progress through ranks.



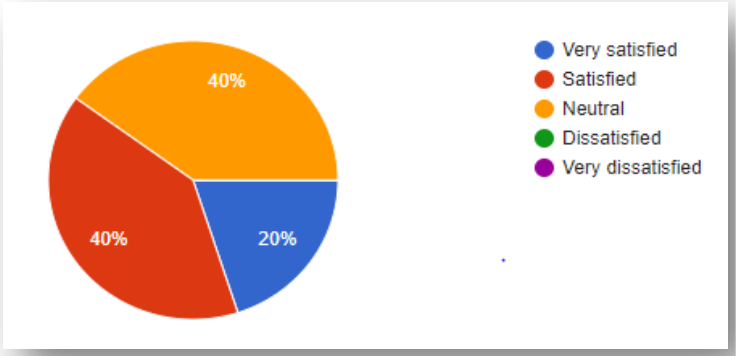
10. Salary and compensation package.



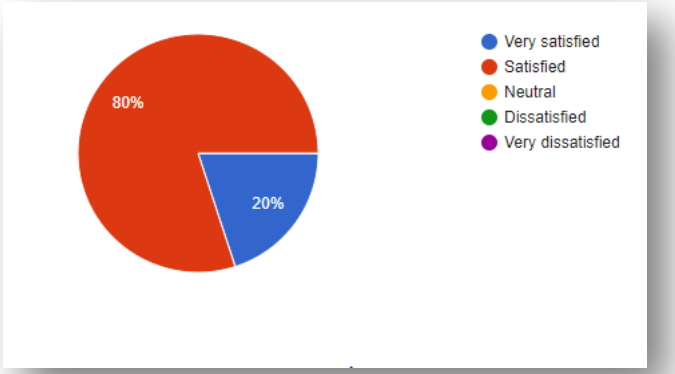
11. Job security and stability at the department.



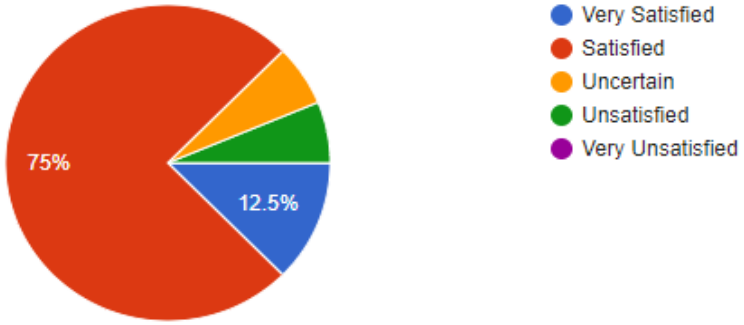
12. Amount of time you have for yourself and family.



13. The overall environment at the department.

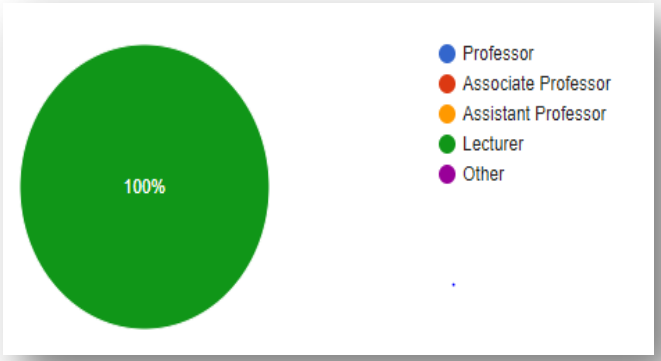


14. Whether the department is utilizing your experience and knowledge.

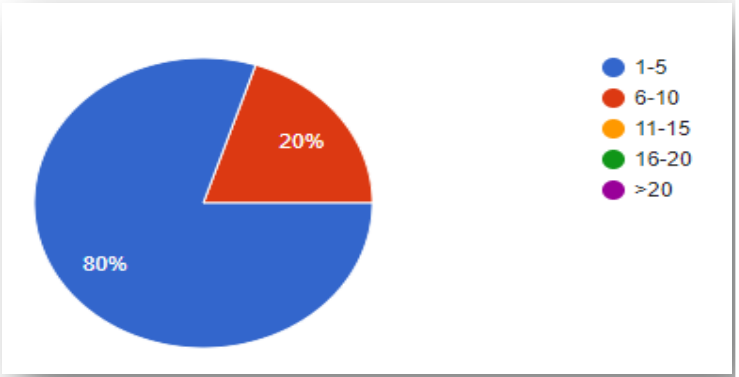


Information About Faculty

i. Academic Rank

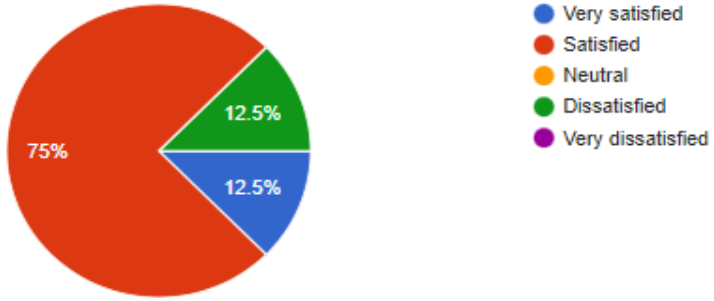


ii. Years of Service

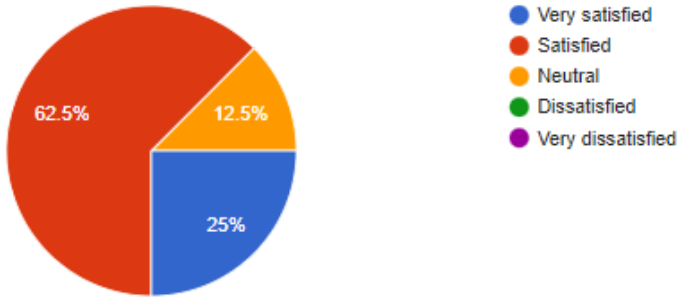


Performa: 5 Faculty Survey Report (Spring 2023)
Department of Sciences

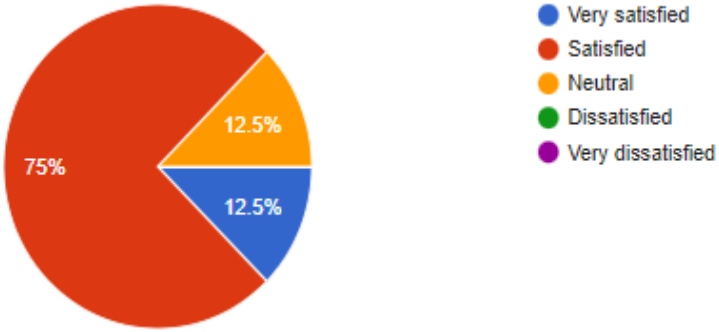
1. Your mix of research teaching and community service.



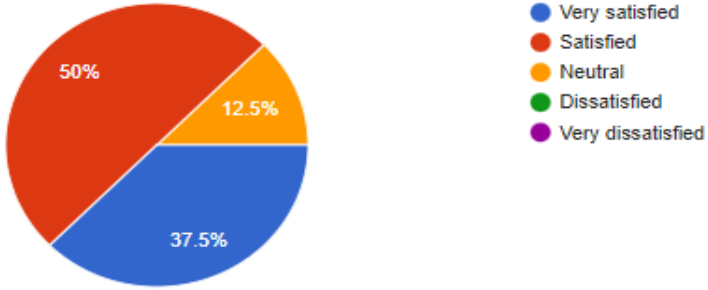
2. The intellectual stimulation of your work.



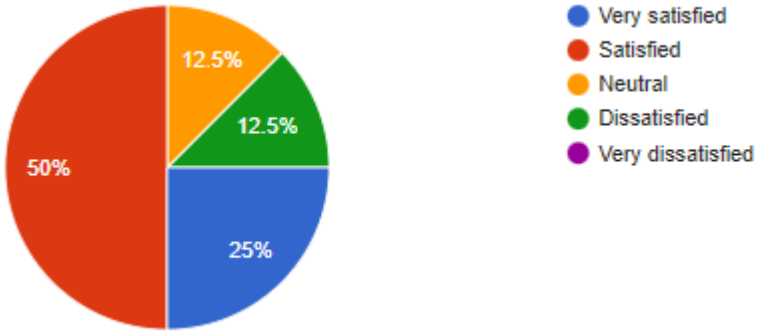
3. Type of teaching / research you currently doing.



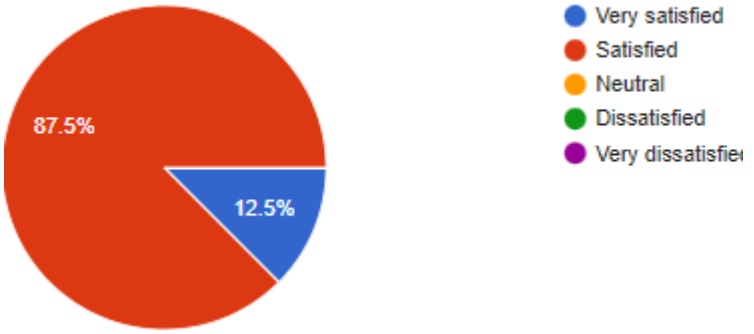
4. Your interaction with students.



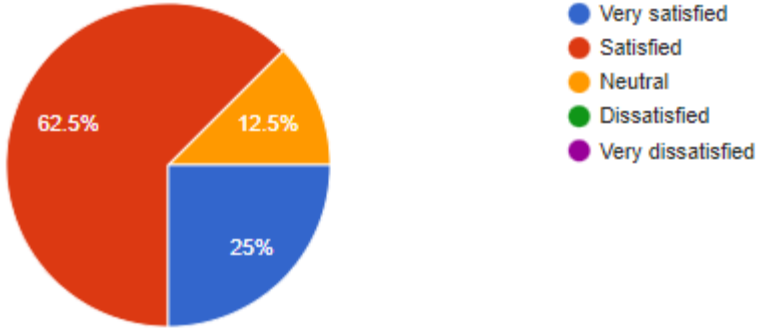
5. Cooperation you receive form colleagues.



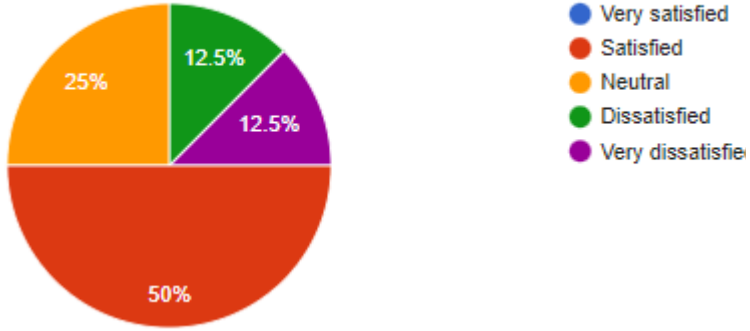
6. The mentoring (guidance) available to you.



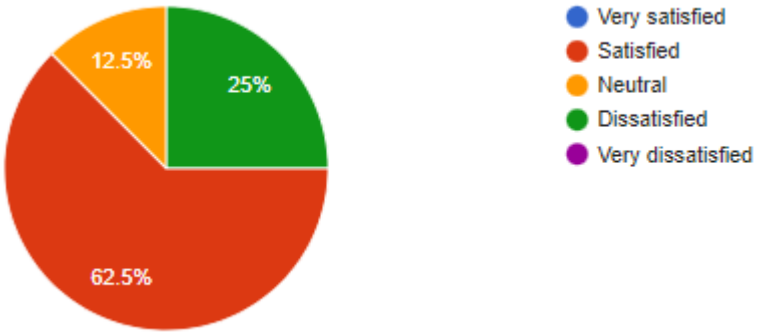
7. Administrative support from the department.



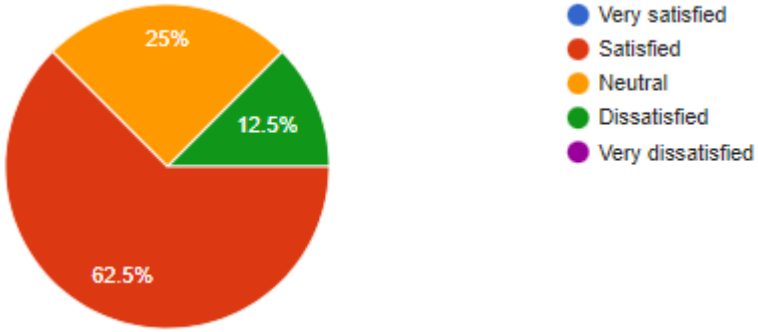
8. Providing clarity about the faculty promotion process.



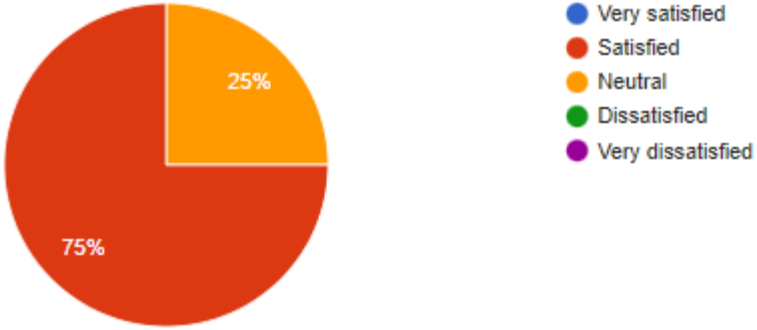
9. Your prospects for advancement and progress through ranks.



10. Salary and compensation package.

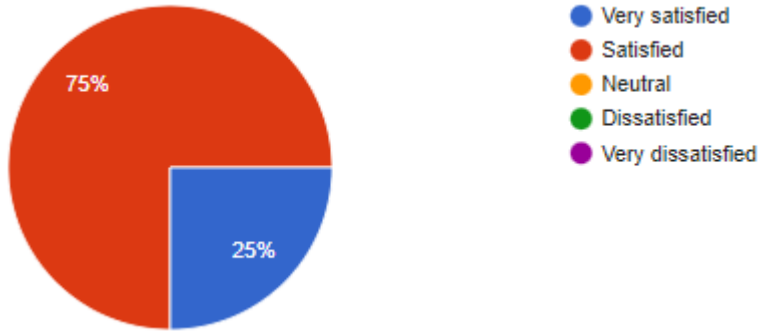


11. Job security and stability at the department.

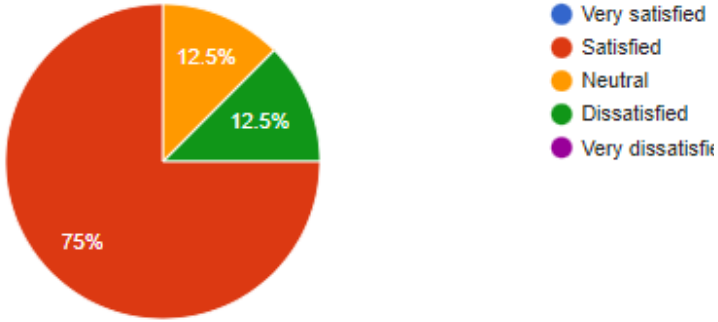


12. Amount of time you have for yourself and family.

13. The overall environment at the department.

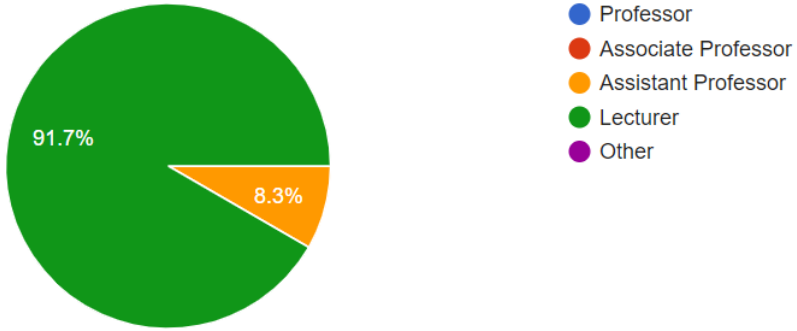


14. Whether the department is utilizing your experience and knowledge.

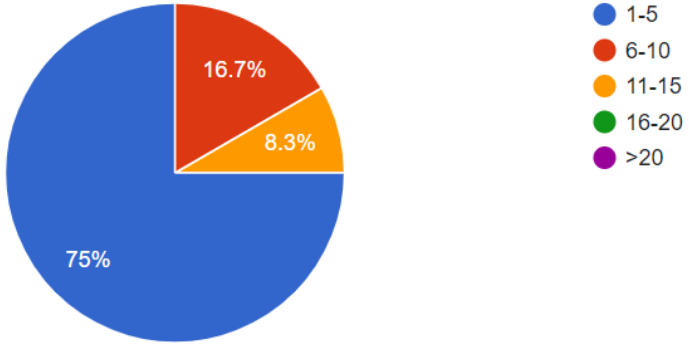


Information About Faculty

iii. Academic Rank

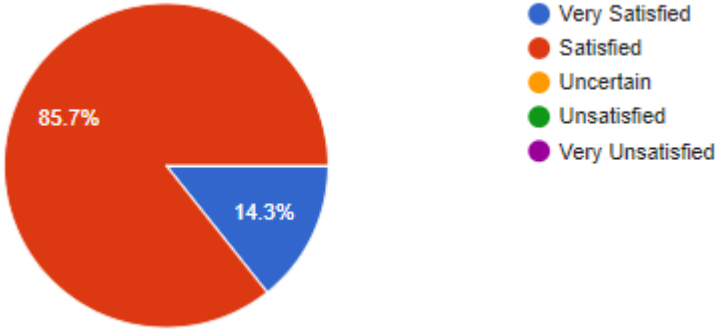


iv. Years of Service

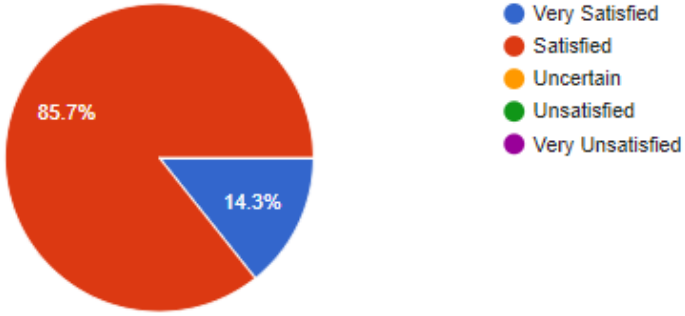


Performa: 5 Faculty Survey Report (Fall 2023)
Department of Sciences

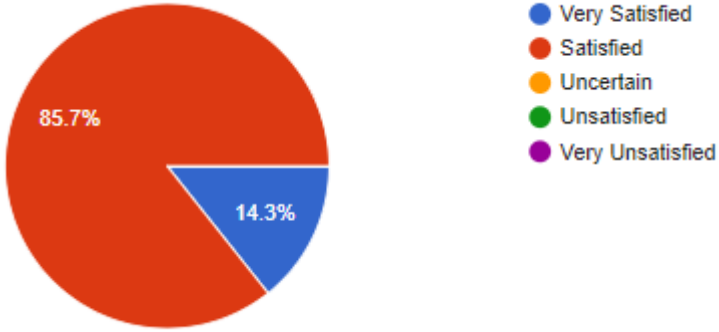
1. Your mix of research teaching and community service.



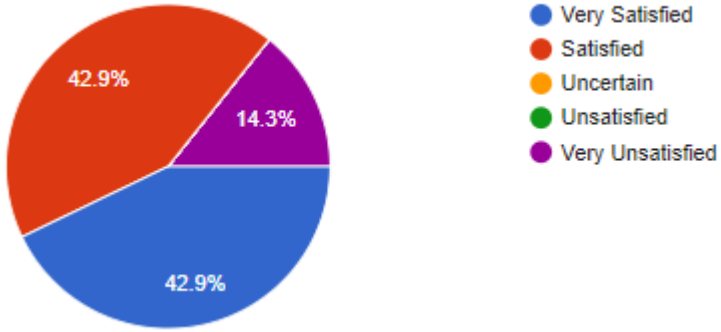
2. The intellectual stimulation of your work.



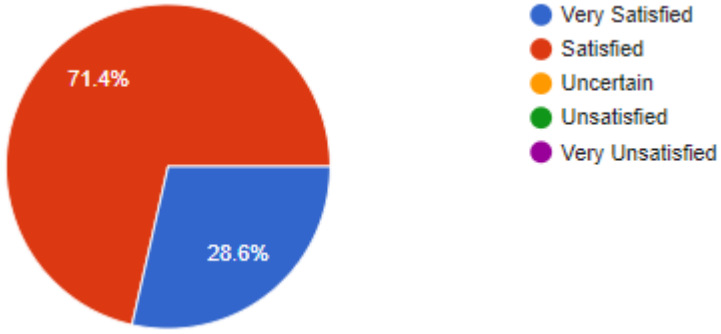
3. Type of teaching / research you currently doing.



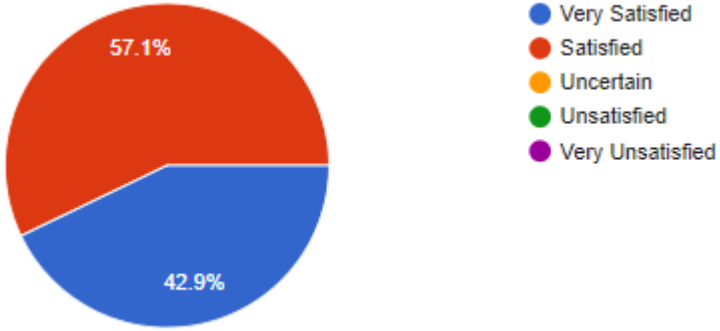
4. Your interaction with students.



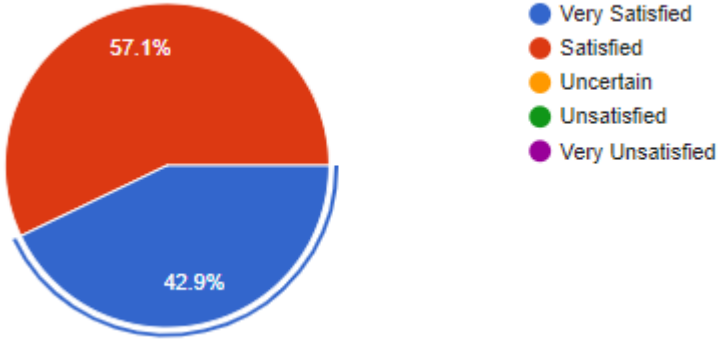
5. Cooperation you receive form colleagues.



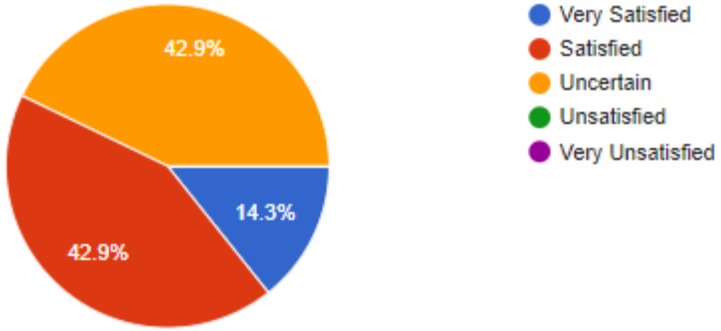
6. The mentoring (guidance) available to you.



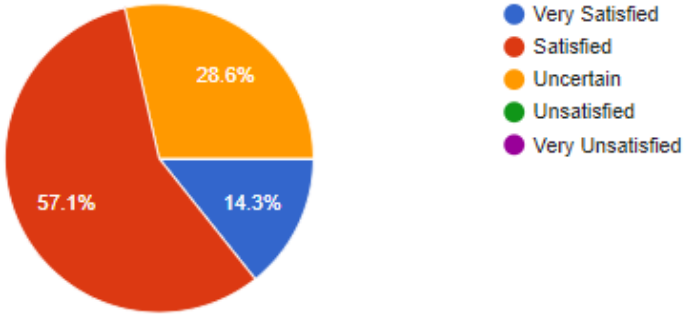
7. Administrative support from the department.



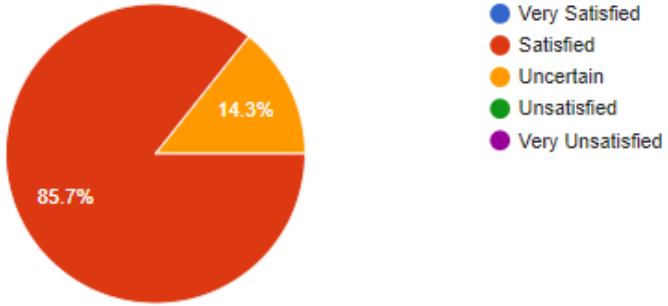
8. Providing clarity about the faculty promotion process.



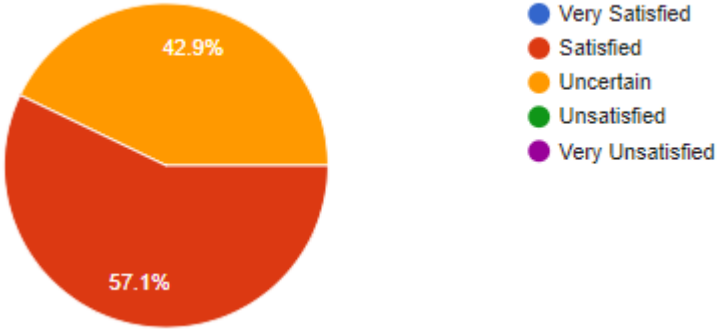
9. Your prospects for advancement and progress through ranks.



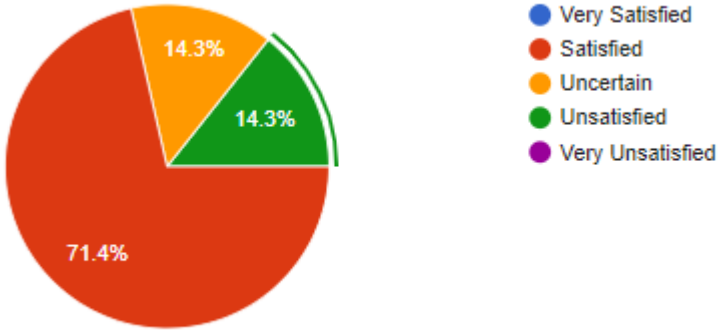
10. Salary and compensation package.



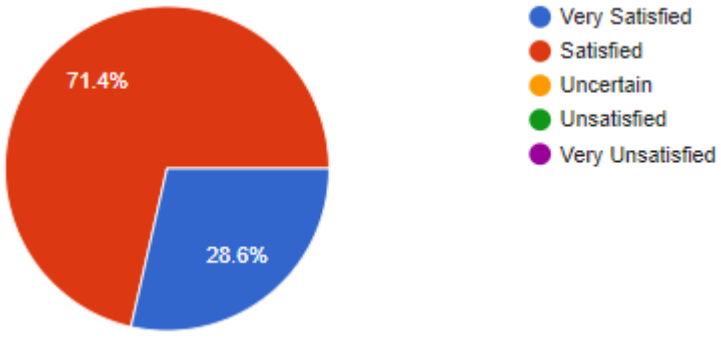
11. Job security and stability at the department.



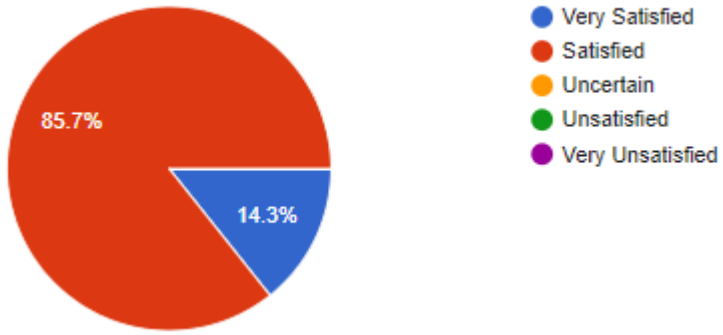
12. Amount of time you have for yourself and family.



13. The overall environment at the department.



14. Whether the department is utilizing your experience and knowledge.



Annexure G: Faculty Course Review

Faculty Course Review Report

(To be filled by each teacher at the time of Course Completion)
For completion by the course instructor and transmission to Head of Department of his/her nominee (Dept. Quality Officer) together with copies of the Course Syllabus outline

Department:	Medical Lab Technology			Faculty:	Sciences
Course Code:	MLT-406	Title:		Clinial Pathalogy	
Session:	2022-2026	Semester:	4^{th}		
Credit Value:	3(2-2)	Level:	Bs(hons)	Prerequisites:	
Name of Course Instructor:	Usman Adrees	No. of Students Contact Hours	Lectures	32	
			Seminars	Nil	
Assessment Methods: give precise details (no & length of assignments, exams, weightings etc.)	Quiz (3),assignments(2),presentations(1),project(1)(10%)midterm (40%), final term(50%) ,Practical, viva, copy ,semester performance (2%)				

Undergraduate	Originally Registered	%Grade A	%Grade B	%Grade C	D	F	F	With drawl	Total
No. of Students	24	32 %	44 %	8.%	4%	12 %	0%	0	24

Course instructor :Usman Adrees Date: 17/08/2024

Faculty Course Review Report

(To be filled by each teacher at the time of Course Completion)
For completion by the course instructor and transmission to Head of Department of his/her nominee (Dept. Quality Officer) together with copies of the Course Syllabus outline

Department:	Medical Lab Technology			Faculty:	Sciences
Course Code:	MLT-407	Title:		Hematology-I	
Session:	2022-2026	Semester:	4th		
Credit Value:	3(2-2)	Level:	Bs(hons)	Prerequisites:	
Name of Course Instructor:	Usman Adrees	No. of Students Contact Hours		Lectures	32
				Seminars	Nil
Assessment Methods: give precise details (no & length of assignments, exams, weightings etc.)		Quiz (3),assignments(2),presentations(1),project(1)(10%)midterm (40%), final term(50%) ,Practical, viva, copy ,semester performance (2%)			

Undergraduate	Originally Registered	%Grade A	%Grade B	%Grade C	D	F	F	With drawl	Total
No. of Students	24	60 %	20 %	12%	4%	4 %	0%	0	24

Course instructor : Usman Adrees Date: 17/08/2024

Faculty Course Review Report

(To be filled by each teacher at the time of Course Completion)
For completion by the course instructor and transmission to Head of Department of his/her nominee (Dept. Quality Officer) together with copies of the Course Syllabus outline

Department:	Medical Lab Technology			Faculty:	Sciences
Course Code:	MLT-305	Title:		Anatomy And Embryology	
Session:	2022-2026	Semester:	4th		
Credit Value:	3(2-2)	Level:	Bs(hons)	Prerequisites:	
Name of Course Instructor:	Prof. Dr. Muhammad Habib Ur Rehman	No. of Students Contact Hours		Lectures	32
				Seminars	Nil
Assessment Methods: give precise details (no & length of assignments, exams, weightings etc.)	Quiz (3),assignments(2),presentations(1),project(1)(10%)midterm (40%), final term(50%) ,Practical, viva, copy ,semester performance (2%)				

Undergraduate	Originally Registered	%Grade A	%Grade B	%Grade C	D	F	F	With drawl	Total
No. of Students	24	42.86 %	47.62 %	9.52 %	0%	0 %	0%	0	24

Course instructor : Prof. Dr. Muhammad Habib Ur Rehman

Date: 17/08/2024

Faculty Course Review Report

(To be filled by each teacher at the time of Course Completion)
For completion by the course instructor and transmission to Head of Department of his/her nominee (Dept. Quality Officer) together with copies of the Course Syllabus outline

Department:	Medical Lab Technology			Faculty:	Sciences
Course Code:	MLT-405	Title:		Fundamentals Of Enzymology	
Session:	Fall 2022-2026	Semester:	4th		
Credit Value:	3(2-2)	Level:	Bs(hons)	Prerequisites:	
Name of Course Instructor:	Mahnoor Zaheer	No. of Students Contact Hours		Lectures	2 hours theory,2 hours lab
		99		Seminars	Nil
Assessment Methods: give precise details (no & length of assignments, exams, weightings etc.)	Quiz (3),assignments(2),presentations(1),project(1)(10%)midterm (40%), final term(50%) ,Practical, viva, copy ,semester performance (2%)				

Undergraduate	Originally Registered	%Grade A	%Grade B	%Grade C	D	F	F	With drawl	Total
No. of Students	24	60 %	28 %	8%	4%	0 %	0%	0	24

Course instructor : Mahnoor Zaheer Date: 17/08/2024

Faculty Course Review Report

(To be filled by each teacher at the time of Course Completion)
For completion by the course instructor and transmission to Head of Department of his/her nominee (Dept. Quality Officer) together with copies of the Course Syllabus outline

Department:	Medical Lab Technology			Faculty:	Sciences
Course Code:	MLT-408	Title:		Molecular Biology	
Session:	2022-2026	Semester:	4th		
Credit Value:	3(2-2)	Level:	Bs(hons)	Prerequisites:	
Name of Course Instructor:	Zartash Zahra	No. of Students Contact Hours		Lectures	33
		99		Seminars	Nil

Assessment Methods: give precise details (no & length of assignments, exams, weightings etc.)	Quiz (3),assignments(2),presentations(1),project(1)(10%)midterm (40%), final term(50%) ,Practical, viva, copy ,semester performance (2%)

Undergraduate	Originally Registered	%Grade A	%Grade B	%Grade C	D	F	F	With drawl	Total
No. of Students	38	16 %	28 %	36%	16%	4%	0 %	0	24

Course instructor : Zartash Zahra Date: 17/08/2024

Annexure H: Faculty Resume

<table>
<tr><th colspan="4">Performa-09
Faculty Resume</th></tr>
<tr><td>Name</td><td colspan="3">Naumana Kanwal</td></tr>
<tr><td>Personal</td><td colspan="3">Department: English Lecturer
Date of Appointment: October 4, 2021
Email Address: numanakanwal11@gmail.com
Contact No : 0300-9623380ndidate feels is pertinent.</td></tr>
<tr><td rowspan="4">Experience</td><td>Designation</td><td>Institute</td><td>No. of Years</td></tr>
<tr><td>Translator</td><td>University of Gujrat</td><td>3</td></tr>
<tr><td>Lecturer</td><td>University of Gujrat</td><td>2</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Honor and Awards</td><td colspan="3">N/A</td></tr>
<tr><td>Memberships</td><td colspan="3">N/A</td></tr>
<tr><td>Post Graduate Students</td><td colspan="3">N/A</td></tr>
<tr><td>Undergraduate Students</td><td colspan="3">N/A</td></tr>
<tr><td>Honour Students</td><td colspan="3">N/A</td></tr>
<tr><td>Service Activity</td><td colspan="3">N/A</td></tr>
<tr><td>Brief Statement of Research Interest</td><td colspan="3">Application of Minimalist Theory on Legal Translated Document</td></tr>
<tr><td>Research grants and Contracts.</td><td colspan="3"></td></tr>
<tr><td>Other Research or Creative Accomplishments</td><td colspan="3"></td></tr>
<tr><td>Selected Professional Presentations</td><td colspan="3"></td></tr>
</table>

Performa-09
Faculty Resume

Name	Mahnoor Zaheer		
Email	noor110499@gmail.com		
Experience	Designation	Institute	No. of Years
	Lecturer	GIMS	6months
	MPhil research scholar	UOG	1 year
Honor and Awards	Winner of Provincial and National level Essay writing and Speech Competitions entitled as Chief Minister's program. Young Summit 2021 participant at National Convention Centre Islamabad Hayat Award for being an organizer of the national event Hayat Rang at UOG.		
Memberships	N/A		
Post Graduate Students	N/A		
Undergraduate Students	48 students were taught by me in previous semester		
Honour Students	N/A		
Service Activity	N/A		

Brief Statement of Research Interest	Antimicrobial resistance, protein biochemistry and genetic manipulations.

Publications	In process
Research grants and Contracts.	None
Other Research or Creative Accomplishments	None

Selected Professional Presentations	Abstract presentation having title as: Drug resistance in *Staphylococcus aureus:* an insight into virulence factors to devise an ultimate therapeutic strategy, in the 2nd international brain and biomedicine conference (IBBC-2024) organized by department of physiology GCUF.

Performa-09
Faculty Resume

<table>
<tr><td>Name</td><td colspan="3">Danish Ilyas Baig</td></tr>
<tr><td>Personal</td><td colspan="3">Department: Sciences
Date of Appointment: October 3, 2022
Email Address: danishbaig802@gmail.com
Contact No : 0305-4212374didate feels is pertinent.</td></tr>
<tr><td rowspan="4">Experience</td><td>Designation</td><td>Institute</td><td>No. of Years</td></tr>
<tr><td>Teacher Assistant</td><td>National University of Sciences and Technology (NUST), Islamabad</td><td>1.5</td></tr>
<tr><td>Lecturer</td><td>Gujrat Institute of Management Sciences (GIMS), Gujrat</td><td>Less than 1</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Honor and Awards</td><td colspan="3">ICT-Endowment Award of NUST
Being granted, based on top merit in the batch
FICS (Finding Innovative & Creative Solutions for Society) 2022-International
https://fics.nust.edu.pk/idea/best.php?year=2022
Winner in the domain of SDG 9 (Industry, Innovation & Infrastructure) based on the idea of fungal bio-materials production having potential to replace plastic, packaging and building materials, with the brand name of “Myco-Mat”</td></tr>
<tr><td>Memberships</td><td colspan="3">N/A</td></tr>
<tr><td>Post Graduate Students</td><td colspan="3">N/A</td></tr>
<tr><td>Undergraduate Students</td><td colspan="3">N/A</td></tr>
<tr><td>Honour Students</td><td colspan="3">N/A</td></tr>
<tr><td>Service Activity</td><td colspan="3">N/A</td></tr>
<tr><td>Brief Statement of Research Interest</td><td colspan="3">A passionate biotechnologist seeking a creative environment to utilize my skills for the betterment of all, especially</td></tr>
<tr><td>Publications</td><td colspan="3">✓ Khan, Haris Ahmed, Danish Ilyas Baig, and Muhammad Faraz Bhatti. "An Overview of Mycoviral Curing Strategies Used in Evaluating Fungal Host Fitness." Molecular Biotechnology (2023): 1-18.</td></tr>
</table>

	https://doi.org/10.1007/s12033-023-00695-1 ✓ 6 publications are under-review
Research grants and Contracts.	
Other Research or Creative Accomplishments	**FICS (Finding Innovative & Creative Solutions for Society) 2022-International** **https://fics.nust.edu.pk/idea/best.php?year=2022** Winner in the domain of SDG 9 (Industry, Innovation & Infrastructure) based on the idea of fungal bio-materials production having potential to replace plastic, packaging and building materials, with the brand name of "Myco-Mat"
Selected Professional Presentations	Presentation of my work at FICS-2022 (as mentioned above)

Performa-09 Faculty Resume			
Name	Usman adrees		
Personal	Department: bio-sciences Date of Appointment: 23/09/2023 Email Address: usmanadrees0@gmail.com Contact No: 03002929336		
Experience	Designation	Institute	No. of Years
	lecturer	Gims	2023 to til
	Lecturer	Gujranwala Institute of Medical and Emerging Sciences	2021-22
	Coordinator	Laboratory Quality Control Coordinator	2017-21
Honor and Awards	Best management award from UOL, Received merit-based laptop.		
Memberships	Conference on Recent Advances in Applied Biosciences" (CRAABS) Member of the literature society (UOL), Member of the dramatic club (UOL).		
Postgraduate students	Nill		
Undergraduate students	400		
Honor Students	200		
Service Activity	Book reading		

Brief Statement of Research Interest	A total of 240 samples of mastectomy specimens (left and right breast) and lump at the right and the left breast were collected from Shaukat Khanum Memorial Cancer Hospital & Research Centre, Lahore, and Institute of Nuclear Medicine and Oncology (INMOL), Lahore within the age range of 26-69 years. The tissues were paraffin-embedded and then applied cancer marker on them through immuno-histochemistry.

Publications	• Variation in Hyperbilirubinemia level of male and female newborns in physiological jaundice: A Retrospective study. • Sources and Prevalence of Aflatoxin B1 in different rice paddies of Punjab and Sindh • Effect of Fluctuation of Covid Positive Cases in Transition Conditions • Expression of Hormone Receptors and Human Epidermal Growth Factor2/Neu in Pre and Postmanopausal Female Breast Cancer Patients
Research grants and Contracts.	Funded by UOL during my research publication
Other Research or Creative Accomplishments	Microbiological Techniques, Molecular Biology Techniques, Histotechnology and Cytotechnology
Selected Professional Presentations	