

SHAH ABDUL LATIF UNIVERSITY
KHAIRPUR

INSTITUTE OF MICROBIOLOGY

SELF-ASSESSMENT REPORT (SAR)

2022



Submitted to:

Quality Enhancement Cell (QEC) Shah Abdul Latif University, Khairpur

By:

Program Team (PT) Members:

- (1) Professor Dr. Zulfiqar Ali Malik
- (2) Professor Dr. Mir Muhammad Ali Talpur
- (3) Dr. Sham Lal

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Introduction:

The Department of Microbiology was established in 1976 and upgraded as Institute of Microbiology in 2017. It is among one of the best departments in the university. We have 15 faculty members of which 10 are permanent and 05 are teaching assistants. Seven faculty members are Ph.D. holders. The department carries out the fundamental microbiology courses for undergraduate students and also advanced microbiology courses and multi-disciplinary research programs for the graduate and postgraduate students.

The current BS/MS/M. Phil. and Ph. D. programs are comprehensive and run according to HEC criteria. The subject courses cover wide variety of topics/options for students.

The diverse and extensive research programs are available in the Institute including Health and medical Microbiology, Industrial and Environmental Microbiology, Agricultural Microbiology, and Food & Dairy Microbiology.

The laboratories in Institute are sufficiently equipped for fundamentals of microbiology. We take great pride in launching our trainees into success and productive mainstream careers who are serving in various capacities at different private and public establishments of the country.

Criterion 1: Program Mission, Objective and Outcomes.

Standards 1.1: The program must have documented measurable Objectives that support Faculty / Institution Mission Statements.

Mission Statement of the University:

- ✓ To achieve and attain Quality Standards and become a Model by providing an outstanding educational environment.
- ✓ Taking measures for capacity building of faculty and supporting staff.
- ✓ Establishing a system to enhance research objectively developed, avoid those policies which encourage malicious activities.

Mission Statement of the Department:

To rise as Centre of Excellence of Microbiology to disseminate information and knowledge in all the fields of Microbiology at National and Regional Level.

Program Objectives:

1. To promote quality education and research in microbiology.

2. To produce graduates at the Bachelor's, Master's and Doctorate's degree levels.
3. To produce quality research in the field of Microbiology and Microbial technology.
4. To serve the general public through awareness and training programs or other means.

Table 1. Shows how Objectives are measured and Improvements have been identified			
Program Objectives Assessment			
Objectives	How Measured	When measured	Improvement Identified
To promote quality education and research in microbiology	Most of the students are employed in educational, research and other related institutions including pathological and diagnostic laboratories	At the end of every academic year.	At least two classrooms needed to be equipped with multi-media & computer facility
To produce graduates at the Bachelor's, Master's and Doctorate's degree levels who can uplift the education and ultimately economy of Pakistan	Highest number of the graduates of the Institute qualify for various posts especially in education, health and research Institutes (Public and Private sectors)	During yearly Alumni association meeting of Institute.	There is great need to improve lab. facilities in the department.
To produce quality research in the field of Microbiology	Students are publishing national and international publications which shows students are doing best in research.	When students pass MS/ M.Phil./Ph.D.	There is a need of training for students to publish in W category journals.

☞ **Note: Improvement Made:** This will be informed after AT visits.

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.

Table: 2. The following Table shows how program outcomes support the Program Outcomes.

Program Objectives	Program Outcomes		
	1.	2.	3.
To promote quality education and research in microbiology	Skilled microbiologists are to be produced.	Most of the students are employed in educational, research and other related institutions including pathological and diagnostic laboratories	Students develop ability to apply knowledge of various fields of Microbiology
To produce graduates at the Bachelor's, Master's and Doctorate's degree levels who can uplift the education and ultimately economy of Pakistan	Highest number of the graduates of the Institute qualify for various posts especially in education, health and research Institutes (Public and Private sectors)	Students buildup confidence and communicate effectively in writing and oral demonstration.	Graduates develop ability to demonstrate progress in various fields of Microbiology
To produce quality research in the field of Microbiology	Students are publishing national and international publications which shows students are doing best in research.	To make students/researchers self-motivated in pursuing research.	The students after graduation are employed in public and private-sector education, research and health care facilities

Survey of Graduating Students:

To be filled out by graduating students in last semester/year before the award of degree

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

S. No.	Question	Percentage/Status				
		A	B	C	D	E
1.	The work in the program is too heavy and induces a lot of pressure.	29%	45%	21%	02%	03%
2.	The program is effective in enhancing team-working abilities.	47%	49%	02%	01%	1%
3.	The program is effective in developing analytical and problem solving skills.	48%	47%	2%	03%	00%
4.	The program is effective in developing written communication skills.	41%	35%	21%	01%	02%
5.	The program is effective in developing planning abilities.	49%	31%	11%	9%	00%
6.	The objectives of the program have been fully achieved	A	B	C	D	E

		50%	24%	13%	13%	00%
7.	Faculty was able to meet the program objectives	A	B	C	D	E
		50%	31%	8%	9%	2%
8.	Environment was conducive for learning	A	B	C	D	E
		51%	32%	8%	7%	02%
9.	Whether the Infrastructure of the department was good.	A	B	C	D	E
		56%	31%	03%	07%	03%
10.	Whether the program was comprised of Co-curricular and extra-curricular activities	A	B	C	D	E
		15%	21%	29%	21%	14%
11.	Whether scholarships/ grants were available to students in case of hardship	A	B	C	D	E
		5%	03%	2%	11%	79%

Strengths

- The program is satisfactory in team-working capabilities.
- Developing independent and written communication is also satisfactory.
- Objectives are almost achieved.

Weaknesses

- The program is too heavy and stressful
- Infrastructure of the Institute needs to be improved.
- Scarcity of scholarships for students in case of hardship.
- There is uncertainty in developing analytical and problem solving skills.

Alumni Survey:

Alumni Survey

(To be filled by Alumni- after the completion of each academic year)

A: Excellent B: Very Good C: Good D: Fair E: Poor

S. NO	QUESTION	PERCENTAGE / STATUS				
		A	B	C	D	E
1	Knowledge Did you learn?					
	1.1 Problem formulation and solving skills.	70%	19%	6%	05%	0%
	1.2 Collecting and analyzing appropriate data.	80%	15%	0%	2%	3%
	1.3 Ability to link theory to practice.	55%	35%	5%	3%	2%
	1.4 Ability to design a system component or process	79%	21%	0%	0%	0%
	1.5 IT knowledge	55%	43%	2%	0%	0%
2	Communications Skills					
	2.1 Oral communication	78%	17%	6%	0%	0%
	2.2 Report writing	81%	15%	4%	0%	0%
	2.3 Presentation skills	72%	22%	6%	0%	0%
3	Interpersonal Skills.					
	3.1 Ability to work in teams.	80%	11%	6%	2%	1%
	3.2 Ability to work in arduous / challenging situation.	70%	25%	5%	0%	0%
	3.3 Appreciation of ethical Values.	60%	33%	7%	0%	0%
4	Management / leadership Skills.					
	4.1 Resource and Time management skills	73%	20%	6%	1%	0%
	4.2 Judgment	71%	22%	7%	0%	0%
	4.3 Discipline	72%	22%	1%	3%	2%

The data have been collected by the students, who graduated from the university and working at different institutes/departments, regarding the quality of education they received and experienced in the university. The next will be conducted after 2 years.

General Assessment Alumni Survey:

- Poor in IT knowledge, Collecting and analyzing appropriate data, Report writing and presentation skills.

- √. Excellent ability working in team
- √. Good in oral presentation,
- √. Independent thinking and
- √. Sound in discipline
- √. Ability Problem formulation and solving skills

General Comments:

Almost all have given comments that there must be very comprehensive computer related teaching method, group discussion, research project preparation & presentation.

Employer survey:

The employer survey has been conducted. The same will be conducted after couple of years. The following overall outputs have been obtained by the employer regarding the performance of the graduates' educated form the university and working at their departments/institutes.

A: Excellent B: Very good C: Good D: Fair E: Poor

KNOWLEDGE						
1.	Math, Science, Humanities and professional discipline, (if applicable)	A	B	C	D	E
		01%	39%	40%	20%	0%
2.	Problem formulation and solving skills	A	B	C	D	E
		0%	20%	55%	20%	05%
3.	Collecting and analyzing appropriate data	A	B	C	D	E
		19%	0%	41%	0%	40%
4.	Ability to link theory to Practice	A	B	C	D	E
		0%	20%	20%	20%	40%
5.	Ability to design a system component or process	A	B	C	D	E
		0%	20%	20%	60%	0%
6.	Computer knowledge	A	B	C	D	E

	20%	0%	20%	40%	20%
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COMMUNICATION SKILLS

1.	Oral communication	A 20%	B 0%	C 30%	D 40%	E 0%
2.	Report writing	A 20%	B 10%	C 0%	D 50%	E 20%
3.	Presentation skills	A 20%	B 0%	C 0%	D 40%	E 40%

INTERPERSONAL SKILLS

1.	Ability to work in teams	A 20%	B 05%	C 20%	D 55%	E 0%
2.	Leadership	A 20%	B 0%	C 10%	D 20%	E 50%
3.	Independent thinking	A 10%	B 10%	C 0%	D 60%	E 20%
4.	Motivation	A 05%	B 15%	C 0%	D 20%	E 60%
5.	Reliability	A 0%	B 20%	C 60%	D 0%	E 20%
6.	Appreciation of ethical values	A 0%	B 40%	C 40%	D 0%	E 20%

WORK SKILLS

1.	Time management skills	A 10%	B 30%	C 20%	D 20%	E 20%
2.	Judgment	A 05%	B 15%	C 20%	D 40%	E 20%
3.	Discipline	A 0%	B 60%	C 20%	D 10%	E 10%

Table: 6. Weaknesses & Strengths of the program.

Weaknesses	Strengths	General Comments
1. Computer knowledge. Report writing 2. Report writing & Presentation skills 3. Time management skills	1. Ability to work in teams, Motivations 2. Discipline	1. The employees may be given computer skills, collecting data, analysis, report preparation and finally presentation.

☞ 75% Percentage of the employers that is strongly satisfied with performance of the Institutes' graduates.

Program Objectives	Program Outcomes		
	1	2	3
To produce graduates who can execute enthusiastically in education and research.	X X X X	X X X	X X X
To build up the graduates with a sense of dedication, motivation and hard work so that they can play their role to maintain and uplift the quality culture of life sciences in the country.	X X X	X X X	X X X
To Guide students for independent and self-motivated in the field of research.	X X X X	X X X	X X X
X	Relevant & satisfactory to some extent		
XX	Relevant & satisfactory		
XXX	Very relevant & satisfactory		
XXXX	Highly relevant & highly satisfactory		

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

Major Future Improvement Plans:

- ☞ To impart quality education in the Institute using audio visual aids and modern tools along with provision of latest literature, journals, books, reviews and access to internet.
- ☞ To upgrade Graduate & Post Graduate Laboratories with the modern equipment
- ☞ To emphasize problem oriented research work on specific areas related to microbiology and biotechnology.
- ☞ Overall enhancement of knowledge and skills of faculty members in relation to the latest global advancements in various discipline through exchange programs, short trainings and collaborative research projects within and outside country.

Table: 4. Shows Program Strengths & Weakness.

Program Strengths and weaknesses.				
Program	Strengths	Weaknesses	Things to be developed	Activities taken for improvements
BS.I-BS.IV	Good teaching and research facilities in the areas of basic Microbiology	Insufficient modern equipment and especially lack of chemicals and media.	<ol style="list-style-type: none"> 1. Relevant books & Journal 2. Multimedia facility 3. Laboratory facilities (Reagents, media) 4. IT training 	Budget has been allocated for the purchasing of equipment

Standard 1.4: The department must assess its overall performance periodically using quantifiable measures.

Table: 5. Number of student enrolment during last three years and student faculty ratio:

Program	Year 2020	Students/ Faculty Ratio	Year 2021	Students/ Faculty Ratio	Year 2022	Students/ Faculty Ratio
BS 4Yr	211	14:1	235	15:1	253	17:1
M.PHIL	29	2.9:1	40	4:1	21	2:1
PH.D	5	0.5:1	4	0.4:1	6	0.6:1

Student Course Evaluation:

Student Course Evaluation Questionnaire

(To be filled by each student at the time of Course Completion)

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

CORE QUESTIONS		A	B	C	D	E
Course Content and Organization						
1	The course objectives were clear.	58%	20%	5%	9%	8%
2	The Course workload was manageable.	70%	30%	0%	0%	0%
3	The Course was well organized (e.g. timely access to materials, notification of changes, etc.)	75%	25%	0%	0%	0%
Student Contribution						
4	Approximate level of your own attendance during the whole Course.	70%	18%	9%	03%	0%
5	I participated actively in the Course.	81%	9%	01%	9%	0%
6	I think I have made progress in this Course.	77%	10%	9%	04%	9%
Learning Environment and Teaching Methods						
7	I think the Course was well structured to achieve the learning outcomes.	67%	23%	5%	5%	0%
8	The learning and teaching methods encouraged participation.	75%	15%	03%	04%	3%
9	The overall environment in the class was academic & friendly.	82%	9%	0%	9%	0%
10	Classrooms environment were satisfactory.	60%	36%	4%	0%	0%
Learning Resources						
11	Learn materials provided by teacher were relevant and useful.	80%	9%	7%	4%	0%
12	Recommended reading Books etc. were relevant and appropriate	77%	21%	2%	0%	0%
13	The provision of learning resources in the library was adequate and appropriate.	71%	9%	5%	10%	5%
14	The provision of learning resources on the Web was adequate and appropriate (if relevant)	36%	30%	31%	3%	0%
Quality of Delivery						
15	The Course stimulated my interest and thought on the subject area Teaching techniques of the teacher were interesting and conducive.	40%	51%	9%	0%	0%

16	The pace of the Course was appropriate	53%	37%	5%	5%	0%
17	Ideas and concepts were presented by the teacher were clear.	77%	10%	7%	06%	0%
Assessment						
18	The method of assessment were reasonable.	74%	26%	0%	0%	0%
19	Feedback on assessment was timely.	67%	18%	10%	0%	5%
20	Feedback on assessment was helpful.	60%	23%	10%	07%	0%
Additional Core Questions						
Teaching Assistant Evaluation						
21	I understood the lectures.	80%	11%	09%	0%	0%
22	The material was well organized and presented.	84%	9%	07%	0%	0%
23	The teacher was responsive to student needs and problems.	93%	0%	7%	0%	0%
24	Had the teacher been regular throughout the course?	83%	17%	0%	0%	0%
Practical						
25	The material in the practicals was useful.	60%	36%	04%	0%	0%
26	The demonstrators dealt effectively with my problems.	74%	26%	0%	0%	0%

Program Assessment Analysis:

The Student Course Evaluation Questionnaire filled by the students at the time of course completion. The following are overall views of the students. The data for the performance has been collected from more than 20 students selected randomly.

Student Course Evaluation Assessment:

Weaknesses:

- The provision of learning resources in the library is insufficient. Only 67% students think that the required learning resources in the library are adequate and appropriate.
- Assessment methods and timely feedback of assessment is poor, it requires more attention.
- Practical material is weak, needs to be improved.
- Students may be encouraged more to participate in the lecture/group discussion.

Strengths:

- Course objectives very clear and organized.
- Teaching methods, learning and learning outcomes encouraging, but need to be improved.
- Class environment satisfactory.
- Courses are interesting, useful and helpful for future.

General comments by the students:

- Usage of visual demonstrations and multimedia can make the course interesting and effective. Multimedia should be used to deliver lectures.

Table: 7. Number of publications, awards, workshops & seminars organized by the faculty: (Last three years)

Publications (HEC recognized only)		Research Projects		Monograph	Awards	Scholars produced		Organized National & International Conferences
National	International	Completed	Ongoing			M.Phil	Ph.D.	
3	27	2	1	NA	NA	27	1	NA

Criterion 2: The curriculum must be designed and organized to achieve the program's objectives and outcomes. Also course objectives must be in line with the program outcomes.

Program:

BS Degree: (4 Years; 8 Semesters)

(1st Semester)

Course No.	Title of Course	Th. H	Pr.H	Marks	Credits
ENGL:300	English-I	3	0	100	3
PKST: 300	Pakistan Studies	2	0	100	2
MATH: 300	Mathematics-I	3	0	100	3
MICR: 310	General Microbiology-I:	3	0	100	3
MICR: 311	General Microbiology-I: Lab	0	3	100	3
BIOC: 320	Biochemistry	2	0	100	2
BIOC: 321	Biochemistry: Lab.	0	3	100	1
PHSL/BOTN/ZOOL/320	H: Physiology/ Botany/Zoology	2	0	100	2
PHSL/BOTN/ZOOL/321	H: Physiology/ Botany/Zoology: Lab.	0	3	100	1
Total					18

(2nd Semester)

Course No.	Title of Course	Th. H	Pr.H	Marks	Credits
ENGL:310	English-II	3	0	100	3
ISST/ETHS: 301	Islamic studies / Ethics	2	0	100	2
MATH: 301	Mathematics-II	3	0	100	3
MICR: 312	General Microbiology-II	3	0	100	3
MICR: 313	General Microbiology-II: Lab.	0	3	100	1
BIOC: 322	Biochemistry	2	0	100	2
BIOC: 323	Biochemistry: Lab.	0	3	100	1
PHSL/BOTN/ZOOL/322	H: Physiology/ Botany/Zoology	2	0	100	2
PHSL/BOTN/ZOOL/323	H: Physiology/ Botany/Zoology: Lab.	0	3	100	1
Total					18

(3rd Semester)

Course No.	Title of Course	Th. H	Pr.H	Marks	Credits
ENGL:400	English-III	3	0	100	3
CIVZ: 400	Civilization	3	0	100	3
MATH: 400	Mathematics-III				
MICR: 410	Microbial Taxonomy	3	0	100	3
MICR: 411	Microbial Taxonomy: Lab.	0	3	100	1
BIOC: 420	Biochemistry	2	0	100	2
BIOC: 421	Biochemistry Lab.	0	3	100	1
PHSL/BOTN/ZOOL/420	H: Physiology/ Botany/Zoology	2	0	100	2
PHSL/BOTN/ZOOL/421	H: Physiology/ Botany/Zoology: Lab.	0	3	100	1
Total					18

(4th Semester)

Course No.	Title of Course	Th. H	Pr.H	Marks	Credits
ENGL:401	English-IV	3	0	100	3

ENVS: 401	Environmental Science	2	0	100	2
STAT: 401	Statistics & Computer Skills	3	0	100	3
MICR: 412	Fundamentals of Immunology	3	0	100	3
MICR: 413	Fund: Immunology: Lab.	0	3	100	1
BIOC: 422	Biochemistry	2	0	100	2
BIOC: 423	Biochemistry: Lab.	0	3	100	1
PHSL/BOTN/ZOOL/422	H: Physiology/ Botany/Zoology	2	0	100	2
PHSL/BOTN/ZOOL/423	H: Physiology/ Botany/Zoology: Lab.	0	3	100	1
Total					18

(B.S. Part-III, 5th Semester) M.Sc. (Prev.) 1st Semester

Course No.	Title of Course	Th. H	Pr.H	Marks	Credits
MICR:520	Fundamental Microbiology	3	0	100	3
MICR: 521	Fundamental Microbiology: Lab.	0	3	100	1
MICR:500	Soil Microbiology	3	0	100	3
MICR:501	Soil Microbiology: Lab.	0	3	100	1
MICR: 504	Immunobiology	3	0	100	3
MICR:505	Immunobiology: Lab.	0	3	100	1
MICR:506	General Mycology	2	0	100	2
MICR:507	General Mycology: Lab.	0	3	100	1
MICR:508	Biostatistics	2	0	100	2
MICR:509	Biostatistics: Lab.	0	3	100	1
Total					18

(B.S. Part-III, 6th Semester) M.Sc. (Prev.) 2nd Semester

Course No.	Title of Course	Th. H	Pr.H	Marks	Credits
MICR:502	Bacterial Genetics	3	0	100	3
MICR: 503	Bacterial Genetics: Lab.	0	3	100	1
MICR: 510	Medical Microbiology	3	0	100	3
MICR: 511	Medical Microbiology: Lab.	0	3	100	1
MICR: 512	Veterinary & Plant Microbiology	2	0	100	2
MICR: 513	Veterinary & Plant Microbiology: Lab.	0	3	100	1
MICR: 518	General Virology	0	3	100	3
MICR: 519	General Virology: Lab.	3	0	100	1
MICR: 516	Diagnostic Chemistry for Diseases	2	0	100	2
MICR: 517	Diagnostic Chemistry for Diseases: Lab.	0	3	100	1
Total					18

SYLLABUS FOR BS-IV & M.SC. (FINAL.)

(Field of Specialization)

Clinical Microbiology

1 st Semester			
S.No.	Course title	Course code	Credit hours
1.	Clinical Bacteriology (Th:/Pr:)	MIC-602-603	(3+1)
2.	Applied Microbiology (Th:/Pr:)	MIC-602-603	(3+1)
3.	Diagnostic Virology (Th:/Pr:)	MIC-604-605	(3+1)
4.	Molecular Mechanisms of Antimicrobial Agents (Th:/Pr:)	MIC-606-607	(3+1)
5.	Fundamentals of Biotechnology (Th:/Pr:)	MIC-608-609	(2+1)
Total			19

2 st Semester			
S.No.	Course title	Course code	Credit hours
6.	Medical Mycology (Th:/Pr:)	MIC-610-611	(3+1)
7.	Environmental Microbiology & Public Health (Th:/Pr:)	MIC-612-613	(3+1)
8.	Genetic Engineering (Th:/Pr:)	MIC-614-615	(3+1)
9.	DNA damage, Repair & Carcinogenesis (Th:/Pr:)	MIC-616-617	(3+1)
10.	Epidemiology, Public Health and Bioethics (Th:/Pr:)	MIC-618-619	(2+1)
11.	Degree comprehensive Viva Voce / Thesis	MIC-620	(2+0)
Total			21

(Field of Specialization)

Environmental Microbiology

1 st Semester			
S.No.	Course title	Course code	Credit hours
1.	Applied Microbiology	MIC-602-603	(3+1)
2.	Fresh Water and Marine Microbiology	MIC-635-636	(3+1)
3.	Principles And Applications Of Bioremediation	MIC-623-624	(3+1)
4.	Recombinant DNA Technology	MIC-625-626	(3+1)
5.	Environmental Biotechnology	MIC-627-628	(2+1)
Total			19

2 st Semester			
S.No.	Course title	Course code	Credit hours
6.	Water And Waste Water Treatment	MIC-629-630	(3+1)
7.	Environmental Risk Assessment And Management	MIC-631-632	(3+1)
8.	Bioinformatics	MIC-633-634	(3+1)
9.	Environmental Microbiology & Public Health	MIC-621-622	(3+1)
10.	Epidemiology, Public Health And Bioethics	MIC-618-619	(2+1)
11.	Degree comprehensive Viva Voce / Thesis	MIC-620	(2+0)
Total			21

(Field of Specialization)

Food Microbiology

1st Semester			
S.No.	Course title	Course code	Credit hours
1.	Applied Microbiology	MIC-602-603	(3+1)
2.	Recombinant DNA Technology	MIC-625-626	(3+1)
3.	Food Microbiology	MIC-639-640	(3+1)
4.	Food Born Diseases	MIC-641-642	(3+1)
5.	Food Biotechnology	MIC-643-644	(2+1)
Total			19

2st Semester			
S.No.	Course title	Course code	Credit hours
6.	Food and Dairy Microbiology	MIC-645-646	(3+1)
7.	Food Processing, Preservation and Packaging	MIC-647-648	(3+1)
8.	Bioinformatics	MIC-633-634	(3+1)
9.	Industrial Biotechnology	MIC-651-652	(3+1)
10.	Epidemiology, Public Health and Bioethics	MIC-618-619	(2+1)
11.	Degree comprehensive Viva Voce / Thesis		(2+0)
Total			21

(Field of Specialization)

Applied Microbiology/Biotechnology

1 st Semester			
S.No.	Course title	Course code	Credit hours
1.	Applied Microbiology	MIC-602-603	(3+1)
2.	Recombinant DNA Technology	MIC-625-626	(3+1)
3.	Probiotics	MIC-639-640	(3+1)
4.	Prebiotics	MIC-641-642	(3+1)
5.	Biotechnology	MIC-643-644	(2+1)
	Total		19

2 nd Semester			
S.No.	Course title	Course code	Credit hours
6.	Food and Dairy Microbiology	MIC-645-646	(3+1)
7.	Food Processing, Preservation and Packaging	MIC-647-648	(3+1)
8.	Bioinformatics	MIC-633-634	(3+1)
9.	Industrial Biotechnology	MIC-651-652	(3+1)
10.	Epidemiology, Public Health and Bioethics	MIC-618-619	(2+1)
11.	Degree comprehensive Viva Voce / Thesis		(2+0)
	Total		21

Standard: 2.1: The curriculum must be consistent and support the program's documented objectives.

Table: Courses versus program outcomes

Courses/Group of Courses	Objectives
Clinical Microbiology	Providing the cause of infection and antimicrobial susceptibility data to physicians
Food Microbiology	Explain the interactions between microorganisms and the food environment, and factors influencing their growth and survival.
Biotechnology	To create pharmaceutical, diagnostic, agricultural, environmental, and other products to benefit society.
Environmental Microbiology	To get the knowledge about microbes interacting with the environment and each other, including their effects on the landscape, the spread of viruses and bacteria, the distribution of algae, fungi and parasitical organisms and the associated implications for human health and the environment.

Weaknesses:

Laboratory work be encouraged including short courses on laboratory training, professional ethics and social impact of the Microbiology need to be introduced.

Strengths:

- The curriculum fulfills all basic requirements of program's objective.
- The curriculum design, theoretical background within program's core material and requirements.

Program Learning Outcomes	Program Objectives				
	Skills in critical thinking, Program solving and communication	Initiate and manage change	Understand Professional ethics and responsibility	Employ I. S. Technology	Enable organization to make optimal decision
Students can be able to work individual as well as in team	x	x	x		x
Research oriented graduates	x		x		x

Self determent, and reliance Graduates		x	x		
The graduates produce to render their services in biodiversity & conservation	x	x	x		x
Capable to manage the renewable resources	x	x	x		x
Use up to date tools			x		
Life Long learning	x				
Professional ethics and responsibility	x		x		x

Standard: 2.2. Theoretical background, problems analysis and solution design must be stressed within the program's core material.

Table: 8. Shows Theoretical background, problem analysis and solution of the courses.

Elements	Courses
Theoretical background	ENGL:300
	PKST: 300
	MATH: 300
	MICR: 310
	MICR: 311
	BIOC: 320
	BIOC: 321
	PHSL/BOTN/ZOOL/320
	PHSL/BOTN/ZOOL/321ENGL:310
	ISST/ETHS: 301
	MATH: 301
	MICR: 312
	MICR: 313
	BIOC: 322
	BIOC: 323
	PHSL/BOTN/ZOOL/322
	PHSL/BOTN/ZOOL/323
	ENGL:400
	CIVZ: 400
	MATH: 400
MICR: 410	
MICR: 411	
BIOC: 420	
BIOC: 421	
PHSL/BOTN/ZOOL/420	
PHSL/BOTN/ZOOL/421ENGL:401	

	ENVS: 401 STAT: 401 MICR: 412 MICR: 413 BIOC: 422 BIOC: 423 PHSL/BOTN/ZOOL/422 PHSL/BOTN/ZOOL/423
Problems analysis	MICR:520 MICR: 521 MICR:500 MICR:501 MICR: 504 MICR:505 MICR:506 MICR:507 MICR:508 MICR:509MICR:502 MICR: 503 MICR: 510 MICR: 511 MICR: 512 MICR: 513 MICR: 518 MICR: 519 MICR: 516 MICR: 517 MICR: 701-740
Solution design	MICR: 801, 802,803,804,805,806,807

Standard: 2.3: The curriculum must satisfy the core requirements for the program, as specified by the respective accreditation body. Examples of such requirements are given in Table A.1, Appendix A.

Standard 2-4: The curriculum must satisfy the major requirements for the program as specified by HEC, the respective accreditation body / councils. Examples of such requirements are given in Table A.1, Appendix A.

Standard 2-5: The curriculum must satisfy general education, arts, and professional and other discipline requirements for the program, as specified by the respective accreditation body / council. Examples of such requirements are given in Table A.1, Appendix A.

Minimum Requirements for Each Program
(Program Semester Credit Hours)

Program	Math & Basic Science	Engineering Topics	General Education	Others
B.S – 4 Years	138		20	
M.S – 2 years	24 course work 6 research		0	
M.Phil	24 course work 6 research			

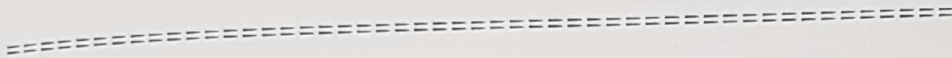
Ph.D	48 including coursework and research			
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Standard 2-6: Information technology component of the curriculum must be integrated throughout the program.

Has the IT program been included in the course: Yes No.

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

Is there any oral/written communication skills have been included in the program:
 Yes No.



Criterion 3: LABORATORIES AND COMPUTING FACILITIES

Standards: 3-1. Laboratories and computing facilities must be adequately available and accessible to faculty members and students to support teaching and research activities.

Laboratory Facilities/Provision:

At present, there are only three laboratories established in the Institute. However, there is a need of more laboratories for M.Sc final and research students.

Laboratory in the Institute:

Lab 1:

- Courses being taught BS1, BSII
- Software available **No**
- All major apparatus/equipments available: Some extent
- Proper safety regulations **Observed**

Title: Location	Institute of Microbiology
Subjects:	To study various subjects of BS I and BSII
Major Apparatus/Equipments	Basic microbiology equipment
Non-functional Equipment	Microscopes
Safety Regulations	Observed accordingly

Lab 2:

- Course being taught: BSIII
- Software available **No**
- All major apparatus/equipments available **No**
- Proper safety regulations **Yes**

Location	Institute of Microbiology
Objectives	To study various subject of BSIII
Major Apparatus/Equipments	Basic microbiology equipment
Non-functional Equipment	Microscope, hot plate, colony counter
Safety Regulations	Observed accordingly

Collaborative Lab 3 (M.Sc (Final) and Research students):

- Courses being taught **M.Sc (Final) and Research students**
- Software available **No**
- All major apparatus/equipments available **Yes**

d) Proper safety regulations **Yes**

Location	Institute of Microbiology
Objectives	To study various subject of BSIII
Major Apparatus/Equipments	Basic microbiology equipment
Non-functional Equipment	Microscope, hot plate, colony counter
Safety Regulations	Observed accordingly

Standard: 3/2 Laboratory manuals/ documentation instruction for experiments must be available and readily accessible to faculty and students.

(1) None (2) Available for students (3) Available for Faculty (4) **Both** ✓

Standard: 3/3 There must be adequate support personnel for instruction and maintaining the program. ✓ **YES**

Standard: 3/4 The University computing infrastructure and facilities must be adequate to support program's objectives Computing Facilities.

NO computing facility in the Institute for the students.

Weaknesses:

- At least TWO well equipped/furnished laboratories be established one for BS and research students
- The Institute lacking some of the basic equipments/instruments.
- Need well trained technicians and equipment operators.
- Technicians may be required for long –term maintenance of equipments
- Some basic lab precautionary facilities like, fire extinguisher apparatus, Fire-Alarm in the building, and First Aid Facilities.
- No access Computer & Internet facilities for the students

Strengths:

- Lab manuals/instructions available and students have adequate access
- Each laboratory has laboratory attendant and assistant for support to students and faculty

Criterion 4: STUDENT SUPPORT AND ADVISING: Students must have adequate support to complete the program in a timely manner and must have ample opportunity to interact with their instructors and receive timely advice about program requirements and career alternatives.

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

Table: 9. Shows classes/week of Major Courses offered in 4 –Year program.

Major Courses offered: BS. 4 Year Program, M.Sc. (Prev), & M.Phil/Ph.D.@ the Ratio of 4:3		
Course offered/Year	Classes/week /CrHs	Practical/week/CrHs
BS.I.1 st Semester	4	3
BS.I.2 nd Semester	3	3
BS. II. 1 st Semester	3	3
BS. II. 2 nd Semester	3	3
BS. III.1 st Semester	12	9
BS. III. 2 nd Semester	12	9
BS. IV. 1 st Semester	12	9
BS. IV. 2 nd Semester	12	9
M.Sc. (Prev) 1 st Semester	12	9
M.Sc. (Prv) 2 nd Semester	12	9
M.Sc. Final 1 st Semester	12	10
M.Sc. Final 2 nd Semester	12	9

The above mentioned classes are strictly followed throughout the academic year. The core courses, optional can be easily completed under the favorable environment.

The compulsory courses managed by Institute of Microbiology, however, other compulsory disciplines and optional subjects are managed by the related Institutes. The details of the compulsory subjects other than the offered by Institute of Microbiology are mentioned above (see section titled **criterion 2**)

Standard: 4:2. Courses in the major are must be structured to ensure effective interaction between students and faculty and teaching and teaching assistance?

(1) Well structured ✓

Standard: 4:3. Guidance on how to complete the program must be available to all students and access to academic advising must be available to make course decisions and career choices.

Are students informed about program requirements?

(1) No (2) ✓ To some extent (3) Fully

Does there student advising system exist and how effective it is?

(1) ✓ No (2) To some extent (3) completely

Have students access to professional counseling?
(1) No (2) To some extent (3) Full

Do the students have interact with practitioners and to have membership in technical & professional societies?
(1) No (2) To some extent (3) Full

Criterion 5: The processes by which major functions are delivered must be in place, controlled, periodically reviewed, evaluated and continuously improved. To meet this criterion a set of standards must be satisfied.

Standard 5:1. The process by which students are admitted to the program must be based on quantitative and qualitative criteria and clearly documented.

Program/credit transfer: NA

Transfer of a student from outside the university: NA

Admission Criteria: The admission policy is constituted by the "Admission Committee" consists of Deans, and senior faculty members of the university. The departments/institutes have no any role. The departments/institutes follow policy made by them which is also mentioned in "Prospectus of the university". However, the admission criteria are evaluated but not regularly.

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:

How frequently admission criteria are evaluated?

(1) None (2) Not regularly (3) Every Year

Are the evaluated results used to improve the results?

(1) No (2) To some extent (3) Yes

Is there any policy regarding program /credit transfer?

(1) No (2) To some extent (3) Well defined

Is there any mechanism of student's registration in the program?

(1) No (2) To some extent (3) Well defined

How frequently process of registration is monitored?

(1) None (2) within 1 year (3) After 1 year (4) When needed

Are the evaluation results used to improve the results?

- (1) No 2) To some extent (3) Yes ✓

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

☞ Shah Abdul Latif University strictly follows the policy of "Equal Opportunity" regardless religion, race, faith, cast & creed, gender regarding recruiting faculty including admissions, educational programs and employment.

☞ The University applies standard operating methodology for evaluation, such as Annual Confidential Report (ACR), required research papers, teaching experience and all other conditions as directed by the HEC. Thus

☞ This process ensures the objectives of the program mission.

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

☞ It is strictly observed that the time table is followed by the faculty. However, **Weaknesses & Strengths** have been observed through the student feedback for the "Course Evaluation". The Institute needs to improve in various aspects.

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

The process for the degrees of M.Phil/Ph.D. has been well designed by the Board of Advanced Studies & Research (BASR) followed by the HEC directions. Details are as under.

under.

Degree	GPA/Class/GRE	Interview	
BS-4 Year/M.Sc.	Pre-Admission Test (NTS) style	X	
M.Phil.	Subject GRE	✓	

Ph.D.	Subject GRE & GPA more > 3.0	√	
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This process must be periodically evaluated to ensure that it is meeting its objectives. √ (Yes)

The department ensures that the graduates actively participate in laboratory work, punctual in the classes, maintaining attendance over 75%.

Assessment of Teacher Evaluation. (Filled by the student)

Teacher Evaluation (Filled by the student)

(A: Strongly Agree, B: Agree, C: Uncertain, D: Disagree, E: Strongly Disagree :)

INSTRUCTOR		A	B	C	D	E
1	The Instructor is prepared for each class.	80%	15%	0%	5%	0%
2	The Instructor demonstrates knowledge of the subject.	75%	25%	0%	0%	0%
3	The Instructor has completed the whole course.	80%	20%	0%	0%	0%
4	The Instructor provides additional material apart from the textbook.	47%	23%	20%	7%	3%
5	The Instructor gives citations regarding current situations with reference to Pakistani context.	30%	24%	23%	20%	3%
6	The Instructor communicates the subject matter effectively.	70%	20%	10%	0%	0%
7	The Instructor shows respect towards students and encourages class participation.	77%	20%	0%	3%	0%
8	The Instructor maintains an environment that is conducive to learning.	75%	20%	5%	0%	0%
9	The Instructor arrives on time.	90%	10%	0%	0%	0%
10	The Instructor leaves on time.	A	B	C	D	E

		90%	5%	5%	0%	0%	
11	The Instructor is fair in examination.	A	B	C	D	E	
		80%	10%	10%	0%	0%	
12	The Instructor returns the graded scripts etc. in a reasonable amount of time.	A	B	C	D	E	
		20%	20%	50%	10%	0%	
13	The Instructor was available during the specified office hours and for after class consultations.	A	B	C	D	E	
		90%	5%	5%	3%	0%	
COURSE							
1	The Subject matter presented in the course has increased your knowledge of the subject.	A	B	C	D	E	
		73%	23%	0%	0%	3%	
2	The syllabus clearly states course objectives requirements, procedures and grading criteria.	A	B	C	D	E	
		77%	21%	2%	0%	0%	
3	The course integrates theoretical course concepts with real world applications.	A	B	C	D	E	
		40%	40%	17%	0%	3%	
4	The assignments and exams covered the materials presented in the course.	A	B	C	D	E	
		47%	40%	13%	0%	0%	

Criterion: 6. Faculty. Faculty members must be current and active in their discipline and have the necessary technical depth and breadth to support the program. There must be enough faculty members to provide continuity and stability, to cover the curriculum adequately and effectively. To meet this criterion the following standards must be satisfied.

Standard: 6: 1. There must be enough full time faculty who are committed to the program to provide adequate coverage of the program areas / courses with continuity and stability. The interest of all faculty members must be sufficient to teach all courses, plan, modify and update courses. The majority must hold a Ph.D. degree in the discipline.

Table: 10. Program areas and number of faculty in each area.

Program Areas of specialization	Courses in the area.	Number of faculty members in each area	Number of faculty with Ph.D. degree
Clinical Microbiology	Mentioned above in criterion 2	9	2
Food Microbiology	Mentioned above in criterion 2	1	0
Biotechnology	Mentioned above in criterion 2	2	2
Environmental Microbiology	Mentioned above in criterion 2	3	3
Total			

* One visiting professor

Faculty Resume:

Note: Faculty resumes are well documented as per policy/criteria of HEC. Names of the faculty members and field of specialization are as under.

Name:	Position	Qualification	Field of specialization
Dr. Abdul Hussain Shar	Professor	Ph. D	Clinical Microbiology
Dr. Zulfiqar Ali Malik	Professor	Ph. D	Environmental Microbiology
Dr. Mir Muhammad Ali Talpur	Professor	Ph. D	Biotechnology
Dr. Muneer Ahmed Qazi	Associate Professor	Ph. D	Environmental Microbiology
Dr. Sham Lal	Associate Professor	Ph. D	Clinical Microbiology
Ms. Khalida Unar	Assistant Professor	(Ph. D)	Environmental Microbiology
Dr. Anwar Ali Phulpoto	Assistant Professor	Ph. D	Environmental Microbiology
Dr. Irfan Ali Phulpoto	Assistant Professor	Ph. D	Biotechnology
Mr. Majid Ali maitlo	Assistant Professor	M.Phil	
Ms. Saira Bano Chandio	Curator cum Lecturer	(M.Phil)	
Miss Nadia Aftab Shaikh	Teaching Assistant	M.Phil	
Miss Rabial Ghumro	Teaching Assistant	M.Phil	
Miss Fiza Tabassum	Teaching Assistant	(M.Phil)	

Fiaz Hussain Shah	Teaching Assistant	M.Phil	
Abdul Ghani Gad	Teaching Assistant	M.Sc.	

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.

☞ **Faculty Survey:**

Are all faculty members current in their disciplines?

(a) Up to 20 % (b) Up to 50% (c) Up to 75% (d) Over 75%

Is there sufficient time for faculty members for scholarly activities and professional development?

(a) No (b) To some extent (c) **Full**

- I. Participation in seminars, conferences at National/International levels.
- II. Research proposals for funding and linkage with other Institutions.
- III. Taking classes, involved in research and reading new books in the relevant field.
- IV. Publications in HEC recognized journals or journals having impact factors.
- V. Organize workshops, seminars and conferences.
- VI. The Institute arranges lectures from eminent scholars on various topics of the subject for its students and faculty at National level.
- VII. Prepare their resume in line with HEC guidelines.

Faculty Development Program: Faculty development programme is needed through Ph.D and Post doc scholarships.

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

The following criteria are under practice in order to satisfy the faculty members in their profession.

- I. Fair, timely selection, appointment / promotion as per HEC policy.
- II. Providing Tenure Track salary package
- III. Excellent working environment.

Faculty Survey:

The following information has been collected through the Proforma from the faculty members: The data is shown as percentage:

A: Very satisfied B: Satisfied C: Uncertain D: Dissatisfied E: Very dissatisfied.

- Your mix of research, teaching and community service. A: 15%, B: 85%
- The intellectual stimulation of your work. A: 13%, B: 87%
- Type of teaching / research you currently do. A: 70, B: 30%

- Your interaction with students. A: 84%, B: 16%
- Cooperation you receive from colleagues. B: 80%, C: 20%
- The mentoring available to you: B: 66.66% , D: 16.66%, C: 16.66%
- Administrative support from the Institute. A: 13%, B: 87%
- Providing clarity about the faculty promotion process. B: 66.66% , D: 16.66%, C: 16.66%
- Your prospects for advancement and progress through ranks. A: 11%, B: 89%
- Salary and compensation package. A: 33.33% B: 66.66%
- Job security and stability at the Institute. A: 33.33%, B: 50%, C: 16.66%
- Amount of time you have for yourself and family. B: 87%, D: 13%
- The overall climate at the Institute. B: 84%, C: 16%
- Whether the Institute is utilizing your experience and knowledge. A: 20%, B: 60%, C: 20%
- What are the best programs / factors currently available in your Institute that enhance your motivation and job satisfaction:

1) General Comments:

a) Teachers have expressed their views that seminars, symposiums and conferences, in general, have motivated to impart the new techniques and methods of teaching.

Suggest programs / factors that could improve your motivation and job satisfaction?

b) More faculty members may be appointed on the regular basis or contract to cover the workload as per HEC policy.

Criterion: 7. Institutional Facilities. Institutional facilities, including library, clean rooms and offices must be adequate to support the objectives of the program. To satisfy this criterion, the following standards must be met.

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

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.

Standard 7:3. Class rooms must be adequately equipped and offices must be adequate to enable faculty to carry out their responsibility.

Details of facilities available in the department:

Item	Position	Remarks
Seminar Library & Books/Journals	√ Yes. Good number of books available.	Needs more books including research journals
Computing Laboratory	X	At least 1 Computing needed for research scholars.
Laboratory	3, but incomplete	2 well equipped needed
Class Rooms	4	Need more classrooms and to be equipped with Multimedia, internet facility
Girls Common Room	X	Need with complete facility of washroom/dressing room.
Boys Common Room	X	Needed
Faculty offices	√ Yes	More offices are needed, since some faculty members are sitting in cabins
Internet & Digital Library Facility	X	1 room needed with complete facility of internet.
Computers	X	Facility needed for the research scholars/ Postgraduate students and faculty members

Criterion: 8. Institutional Support. The institution's support and the financial resources for the program must be sufficient to provide an environment in which the program can achieve its objectives and retain its strength.

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

The Institute has 3 laboratories. There is need of some more laboratories for BS and research students. There are qualified faculty members who provide facility for all faculty and students to maintain competence. The expenses for regular purchase of chemicals, glass wares are born by the university, while the funds are very limited that to be enhanced. The major financial source is the University which allocates budget for the Institute.

Standard 8:2. There must be an adequate number of high quality graduate students, research students

Program	Year 2020	Students/ Faculty Ratio	Year 2021	Students/ Faculty Ratio	Year 2022	Students/ Faculty Ratio
BS 4Yr	211	14:1	235	15:1	253	17:1
M.PHIL	29	2.9:1	40	4:1	21	2:1
PH.D	5	0.5:1	4	0.4:1	6	0.6:1

Standard 8-3: Financial resources must be provided to acquire and maintain library holding, laboratories and computing facilities.

☞ The University provides resources to maintain library & laboratories.

Does the Institute provide opportunities to the faculty members to attend international / national conferences?

(1) No (2) To some extent (3) Full✓


PT Members

- 1) Professor Dr. Zulfiqar Ali Malik
- 2) Professor Dr. Mir Muhammad Ali Talpur
- 3) Dr. Sham Lal


Signature

Signature

Signature


11-03-2022

Chairman's/Directors Comments

The self-Assessment Report (SAR) of Institute of Microbiology has been finalized by PT members with great dedication and efforts. They have written real facts and figures of Institute of Microbiology. The strengths and weakness of Institute are clearly mentioned. The quality of education in Institute of Microbiology can be assessed from students, alumni and employees responses.

Name and Signature

Professor Dr. Zulfiqar Ali Malik


11-03-2022