

Admission Autumn 2024

PROSPECTUS

BS (Face to Face)

- Faculty of Sciences
- Faculty of Education

AIOU



Allama Iqbal Open University, Islamabad

www.aiou.edu.pk

Help Line: (051) 111-112-468

PROSPECTUS
OF
BS (Face to Face) Programmes
For
SEMESTER: Autumn, 2024



Allama Iqbal Open University, Islamabad

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Semester:.....	Autumn, 2024
Printing Incharge.....	Dr. Sarmad Iqbal
Composed by:	Muhammad Zia Ullah
Printer:.....	AIOU Printing Press
Publisher:	Allama Iqbal Open University

Vice-Chancellor's Message

Dear Student,

السلام عليكم

Allama Iqbal Open University (AIOU) is one of the mega universities of the world and it occupies a unique position in the education sector of Pakistan, because of its affordability and high quality distance and online academic programs. AIOU has now turned into the most favorite university of the country with high international repute. The university made a landmark progress by ensuring access to quality education for rural areas under-privileged students and the people of all ages particularly the females can now select and join the programs of their choice, while sitting at their residence and simultaneously with continuing their jobs. After assessing the success of many degree programs in Pakistan, AIOU is now going to offer a variety of range programs for the students residing worldwide. More than 1.3 million students are getting benefits from the high quality educational services of AIOU in all regions of the country through more than fifty regional offices of the university. It offers-suggests many undergraduate and postgraduate programs at rural and remote areas providing an unparalleled opportunity to all the poor and deprived segments of the society at an affordable cost. The university has recently digitalized all its student-support services for facilitating its students on priority basis. This digitization of the system, it is hoped, will enable AIOU students to get all discipline of educational programmes using their Learning Management system (LMS) portal support online.



Committed to your bright future

Prof. Dr. Nasir Mahmood
Vice Chancellor

IMPORTANT ACTIVITIES TO BE REMEMBERED

Activity	Spring Semester	Autumn Semester
Admissions	March-April	September- October
Study Period	June- October	December- April
Examinations	October- November	April- May
Result	January	July

Note: Contact concerned Regional office for exact schedule of activities. Continuing students are sent information for all activities by LMS/SMS. Simultaneously information is placed on website (www.aiou.edu.pk), students can download if not received by post.

Note: The University reserves the right to cancel the admission in BSC based 2.5 years and ADS based 2 years programme, where a viable group is not formulated. The fee to such applicants will be refunded.

Note: All students who meet the general eligibility requirements outlined in the prospectus will be granted admission to all BS Programme. The challan form will be generated immediately upon completion of the application process.

**MINIMUM AND MAXIMUM DURATION/SEMESTERS
FOR FACE TO FACE PROGRAMMES**

Sr. No.	Degree Level	Minimum Duration	Maximum Duration
1	Ph.D	3 years / 5 semesters	8 years *
2	MS/M.Phil/M.Sc (Hons)/MBA/COL MBA/MPA	2 years / 4 Semesters	4 Years **
3	M.A/M.Sc (2-Year)	2 Years / 4 Semesters	4 Years
4	BS (4-Year)	4 years / 8 Semesters	6 Years
5	Postgraduate Diploma (1-Year)	1 Year / 2 Semesters	2 Years
6	Certificate (6-Months)	6 Months / 1 Semester	1 Years
7	BS 2.5 years	2.5 Years/5 Semester	4 Years
8	BS 2 Years	2 years/ 8 Semester	4 Years

Evaluation/Assessment Criteria for all PGD/ADS/BS Face to Face Programmes

For Theory Courses:

S.No.	Components	Total Marks	Weightage	Passing Marks
1	Assignment	10	20%	50% (In aggregate)
2	Assignment 2	10		
3	Mid Term	30		
4	Attendance	100	Nil	70%
5	Final Exam	100	50%	50%

For Theory-Practical Courses:

S.No.	Components	Total Marks	Weightage	Passing Marks
1	Assignment	10	20%	50% (In aggregate)
2	Assignment 2	10		
3	Mid Term	30		
4	Practical	15	30%	
5	Attendance	100	Nil	70%
6	Final Exam	100	50%	50%

For Practical/FYP Courses:

S.No.	Components	Total Marks	Weightage	Passing Marks
1	Attendance	100	Nil	70%
2	Final Exam	100	100%	50%

COMPLETE PROCEDURE TO ENROLL IN AIOU PROGRAMMES AND SUBMISSION OF FORM IN AIOU ISLAMABAD

All fresh and continue students can submit their admission using online system.

Follow these instructions to apply:

APPLY ONLINE (FRESH STUDENTS)

1. Visit website: <https://aiou.edu.pk/oas-fresh-admission>
2. Press link “**Application for New Admission** ⇒ **Click here**”
3. Get register by entering your email or mobile phone number
4. Login into your registered account
5. Fill all the requisite fields of admission form
6. After filling the admission form, print out your “Challan Form”.
7. Using printed challan form and submit your fee in any branch of FWBL, ABL, MCB, UBL or NBP.
8. **You can also deposit fee through Upaisa, Jazzcash & Easypaisa.**

APPLY ONLINE (CONTINUE STUDENTS):

1. Visit website: <https://aiou.edu.pk/cms-continuing-students>
2. Press link “**CMS for Continuing Students**”; (<https://enrollment.aiou.edu.pk>)
3. Enter your “User ID & Password
4. Select courses and print challan form.
5. Using printed challan form, submit your fee in any branch of FWBL, UBL, MCB or ABL NBP. Keep save copy of your challan form after submission of fee. **You need not to send challan to the University**, but University can ask for copy of challan form any time, if required.
6. You can also deposit fee through Upaisa, Jazzcash & Easypaisa.

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ALLAMA IQBAL OPEN UNIVERSITY

Allama Iqbal Open University, a mega university was established in 1974 under an Act of Parliament. The main campus of the university is situated in sector H-8, Islamabad. It was the second open university of the world and the first of its kind in Asia and Africa. The aim of establishing AIOU was to provide affordable and accessible education through distance learning at the doorsteps to those people who could not continue their educational journey through formal system of education. The University (AIOU) operates on semester system and admits students in Autumn and Spring semesters, Undergraduate admissions are being offered in both the semesters, whereas postgraduates are being offered once a year. The enrolled students are given course books specially prepared by the university on self instructional principles. However, at post graduate level reprints of foreign books alongwith allied material and university prepared study guides help students to polish their skills.

At present, the AIOU is offering programmes from Matric to PhD level in diverse disciplines comprised four faculties. The university has established study centres across the country where distance education students are provided necessary guidance by their respective tutors. AIOU is also offering four years under-graduate degrees.

Apart from curricular and extra-curricular activities during the academic year, the AIOU and its regional centres actively participate in the co-curricular activities by arranging educational and literary seminars, workshops and conferences, attended not

only by the students and faculties of the university, but also by the renowned dignitaries and scholars. For the science students and the research scholars, a science complex has been constructed, where they use the latest equipment of international standard for experiments and research. To meet the present-day challenges, internet facility is also available in the student hostel and the Central Library, where computers have been provided to enable students to access the latest information available through open source databases.

FACULTY OF SCIENCES

Faculty of Sciences form an integral part of the University, Since its establishment in 1982 with five teaching departments, it has undergone major development changes. It now comprises nine teaching and research departments which are offering courses at the undergraduate and postgraduate levels to more than ten thousand students. The Faculty operates under the basic guidelines of the University Act and on “Education for All as Convenient” basis so that maximum students get benefit from its academic programs and educational facilities. This principle has necessitated some structural changes in the non-formal mode, particularly at the postgraduate level, in the offering of theory courses and practical lab work. This conceptual adjustment has been quite successful and many in-service students are benefiting from postgraduate study programs. Improvement in qualification for a better life is a right of everyone and the faculty’s programs meet this challenge by offering opportunities to all. In particular, a significant number of beneficiaries are those who cannot afford education in formal institution due to a variety of reasons.

DEPARTMENT OF BIOLOGY

The approval for the establishment of the Department of Biology Science was granted by the Executive Council in February 1998. The objective of its establishment is to provide human resources/skilled personnel in various areas of Biology. Furthermore, the purpose is to educate future generation and improvement in quality of life and welfare of human being through research for the environmentally sustainable and socially equitable use of the natural resources. The Department is imparting face-to-face education in Pakistan in different disciplines of Biological Sciences.

The mission of Department of Biology is to educate students in various disciplines of Life Sciences including those who could not continue their education due to economic or job constraints. The purpose of its establishment is to educate future generation and improvement in quality of life and welfare of human being through research and self-sufficiency.

The Department is striving to uplift the teaching standards and provide a congenial environment for research in the field of Biology. The Department always seeks to introduce more disciplines at graduate and postgraduate levels as per demand of the society, so as to keep the undergraduate and postgraduate scholars well informed with the recent advances in the field. This will help produce well-trained manpower to serve science both at national and International levels.

The Department is offering following programmes:

- i. BS Botany
- ii. BS Biochemistry

iii. BS Microbiology

The department is enriched with highly qualified regular faculty to fulfill teaching and research requirements. Well equipped labs and Biology are available to cater practical and research requirements.

BS Biochemistry

1. Introduction

Biochemistry can be considered as *chemistry of life* and is central to all areas of the biological or life sciences. It deals with chemical processes taking place in all living organisms from viruses and bacteria to plants and animals. It specifically focuses on the study of biomolecules and vital processes that give rise to complexities of life. It comprehensively demonstrates human biochemical aspects pertaining to the wellbeing and in the pathological state.

BS Biochemistry has an interdisciplinary and multidisciplinary approach enabling students to understand the core principles and experimental basis of Biochemistry. The scope of the discipline is extremely broad and graduates in Biochemistry can progress to a wide range of careers. They can work in national and international organization in either public or private sectors, biochemical industries, food production companies, hospitals and diagnostic laboratories, pharmaceutical industries and research institutes etc.

Biochemists may emerge as *Genetic counselor, Forensic scientists, Healthcare officials, Sequencing data analyst, Research scientists, Project officers, Quality control officers, Genetic engineers* etc.

The programme aims at developing human resources in the field of Biochemistry through appropriate education and research.

2. Objectives

Objectives of this programme are

- i. To equip students with the in-depth knowledge and skills necessary for understanding basic as well as advanced and recent trends in Biochemistry and Molecular Biology
- ii. To impart skills to carry out independent scientific and technical research in key areas of Biochemistry
- iii. To equip students with laboratory procedures and techniques necessary to understand the life processes and enable them to serve in diagnostics and research labs
- iv. To inculcate confidence among students to pursue higher education in their specialized areas of interest

3. Eligibility Criteria

F.Sc (Pre-medical) OR Equivalent "A" Level qualification with Biology as major subject.

Foreign certificate holders will need to produce equivalence certificate from IBCC to seek admission in 4 years BS Biochemistry.

4. Duration of the Programme

In order to be eligible for the award of BS in Biochemistry, the student will have to earn a total of 128 credit hours including Capstone. Project of three credit hours within a minimum period of 4 years (8 semesters) failing which, a student can be given an extension of upto 2 years in maximum after completion of initial period.

5. Scheme of Studies (BS Biochemistry 4- years)

6. Semester wise lay out for BS Programs (Total CH Semester 128)

Semester 1			
Code	Course Title	CH	
BIO3507	Cell Biology	3(2+1)	Major
ITHC3501/	Islamic	2(2+0)	General

HADH3501	studies/Ethics		
PKST3502	Ideology & constitution of Pakistan	2(2+0)	General
MATH3508	Quantitative Reasoning	3(3+0)	General
ENGL3505	Functional English	3(3+0)	General
URD3503	Pakistani Adab-1	2(2+0)	General (Arts and Humanities)
Bio 3509	Introductory Biochemistry	3(2+1)	Major
	Total Credits	18	
Semester-2			
Code	Course Title	CH	
ENGL3504	Expository Writing	3(3+0)	General
BIO 3510	Fundamentals of Microbiology	3(2+1)	Major
SOC3503	Civics and Community Engagement	2(2+0)	General
CS3503	Application of Information communication & Technologies	3(2+1)	General
MATH4505	Quantitative Reasoning II	3(3+0)	General
SOC3506	Introduction to Sociology	2(2+0)	General
	Total Credits	16	

Semester-3			
Code	Course Title	CH	
CHEM3501	Inorganic Chemistry	4(3+1)	General
TBA	Diversity of Plants	3(2+1)	Major
ENVS3505	Diversity of Animals	3(2+1)	Major
ENVS4501	Basics of Environmental science	3(2+1)	General (Natural Science)
MGT3503	Entrepreneurship	2(2+0)	General
BIO4504	Genetics and Evolution	3(2+1)	Major
	Total Credits	18	
Semester 4			
Code	Course Title	CH	
CHEM3502	Organic Chemistry	4(3+1)	General
BIO4505	Biosafety; Principles and applications	3(2+1)	Major
TBA	Biotechnology	3(2+1)	Major
BIO4506	Animal Physiology and Ecology	3(3+0)	Major
BIO4507	Plant Physiology and Ecology	3(3+0)	Major
	Total Credits	16	
Semester 5			
Code	Course Title	CH	
BIO5520	Amino acids and Proteins	3(2+1)	Major
BIO5521	Carbohydrates and Lipids	3(2+1)	Major
TBA	Human Physiology	3(2+1)	Major

BIO6503	Immunology	3(2+1)	Major
BIO5519	Biochemical Techniques	3(2+1)	Major
BIO5501	Microbial Genetics	3(2+1)	Interdisciplinary
TFSR3501	Fahm-e-Quran(Tajwid, Translation & Tafsir)	NC	
	Total Credits	18	
Semester 6			
Code	Course Title	CH	
BIO6514	Enzymology	3(2+1)	Major
BIO5515	Nutritional Biochemistry	3(2+1)	Major
BIO5507	Molecular Biology	3(2+1)	Major
BIO6521	Metabolism-1	3(3+0)	Major
BIO6515	Principles of Clinical Biochemistry	3(2+1)	Major
SERT3501	Seerat -e- Tayyaba	NC	
	Total Credits	15	
Semester-7			
Code	Course title	CH	
BIO6516	Bio-membrane and Cell Signaling	3(3+0)	Major
ENVS3507	Scientific Research and Report writing	3(2+1)	Major
STAT3506	Biostatistics	3(3+0)	Interdisciplinary
BIO6523	Bioinformatics	3(2+1)	Interdisciplinary
BIO6522	Metabolism 2	3(3+0)	Major
	Total Credits	15	
Semester-8			

Code	Course Title	CH	
BIO6519	Capstone Project	3(0+3)	Mandatory
BIO6520	Field Experience	3(0+3)	Mandatory
BIO6505	Genetic Engineering	3(2+1)	Major
BIO6512	Epidemiology	3(2+1)	Interdisciplinary
Total Credits		12	
Total Credit Hours: Semester 5 – 8 =60 and Total CH: 68+60=128			

7. Fee Tariff for 1st Semester

Item	Rates
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.600/-
Per 1 Credit course 2420	Rs. 43560
LAB CHARGES	Rs.3630/-
Total	Rs. 51100/-

The fee structure for remaining semesters will be provided in due course of time.

1. Mode of Study:

i. Medium of Instruction

The Medium of Instructions for BS Bio chemistry will be English.

ii. Study Material

Lecture handouts will be provided by the department. The students are also advised to consult other reference books recommended by the department.

iii. Mode of Teaching

- University will provide face to face teaching to the students.
- The schedule of classes and dates of submission of assignments will be announced by the department.

iv. Assessment and Evaluation

See page (vi)

1.2 Scheme of Studies (BSc Based) BS Biochemistry

Semester wise lay out for BSc based Biochemistry (Total CH Semester 1-4 = 68)

Bridging Semester as per 2023 Policy for

BS Biochemistry (2.5 Years)

BS Microbiology (2.5 Years)

BS Botany (2.5 years)

Course Code	Course Title	Ch
BIO 4508	Diversity of Plants	3 (2+1)
BIO 4509	Diversity of Animals	3 (2+1)
BIO 4510	Biotechnology	3 (2+1)
Bio 4505	Biosafety, principle	3 (2+1)

	and applications	
BIO 3509	Introductory Biochemistry	3 (2+1)
BIO 3510	Fundamental of Microbiology	3 (2+1)
Total Ch		18

Total CH for BS Biochemistry 2.5 Years (18+60)=78

Total CH for BS Microbiology 2.5 Years (18+60)=78

Total CH for BS Botany 2.5 Years (18+62)=80

Eligibility BSc based BS Programme

1. Students holding a BSc degree with 45% marks shall be eligible for admission.
2. Students with associate degree (14 years of education) having less than 60 credit hours shall be eligible for admission.
3. Students with a discipline-specific associate degree who wish to switch to another discipline shall also be eligible for admission.

Semester 1			
Code	Course Title	CH	
BIO5520	Amino acids and Proteins	3(2+1)	Major

BIO5521	Carbohydrates and Lipids	3(2+1)	Major
BIO4502	Human Physiology	3(2+1)	Major
BIO6503	Immunology	3(2+1)	Major
BIO5519	Biochemical Techniques	3(2+1)	Major
BIO5501	Microbial Genetics	3(2+1)	Interdisciplinary
TFSR3501	Fahm-e-Quran(Tajwid, Translation & Tafsir	NC	
Total Credits		18	
Semester 2			
Code	Course Title	CH	
BIO6514	Enzymology	3(2+1)	Major
BIO5515	Nutritional Biochemistry	3(2+1)	Major
BIO5507	Molecular Biology	3(2+1)	Major
BIO6521	Metabolism-1	3(3+0)	Major
BIO6515	Principles of Clinical Biochemistry	3(2+1)	Major

SERT3501	Seerat -e- Tayyaba	NC	
	Total Credits	15	
Semester-3			
Code	Course title	CH	
BIO6516	Bio-membrane and Cell Signaling	3(3+0)	Major
ENVS3507	Scientific Research and Report writing	3(2+1)	Major
STAT3506	Biostatistics	3(3+0)	Interdisciplinary
BIO6523	Bioinformatics	3(2+1)	Interdisciplinary
BIO6522	Metabolism 2	3(3+0)	Major
	Total Credits	15	
Semester-4			
Code	Course Title	CH	
BIO6519	Capstone Project	3(0+3)	Mandatory
BIO6520	Field Experience	3(0+3)	Mandatory
BIO6505	Genetic Engineering	3(2+1)	Major
BIO6512	Epidemiology	3(2+1)	Interdisciplinary
	Total Credits	12	
Total Credit Hours: Semester 5 – 8 =78			

1.3 Fee Tariff for 1st Semester

Item	
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs.1500
Technology Fee	Rs.600/-
Per 1 Credit hour fee: Rs. 2420	Rs. 43560
LAB CHARGES	Rs.3630/-
Total	Rs. 51100/-

3. Contact Details

Incharge

Department of Biology
 Research Complex, 1st Floor, AIOU, H-8, Islamabad
 Tel: 051-9057726; Email: biology@aiou.edu.pk

Coordinator BS-Biochemistry

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 Research Complex, 1st Floor, AIOU, H-8, Islamabad
 Tel: 051 9575273; Email: biology@aiou.edu.pk

BS BOTANY

1. Introduction

The study of plants is vital because they underpin almost all life forms on Earth by generating a large proportion of oxygen and food that allow humans and other organisms to subsist. Plants are one of the major groups of organisms that carry out photosynthesis, a process that absorbs carbon dioxide, a greenhouse gas that is a small but important variable that influences global climate. Plants are crucial to the future of human society as they provide food, oxygen, medicine, and products for people, as well as creating and preserving soil.

This programme has an interdisciplinary and multidisciplinary scope enabling students to understand the concepts of Botany. It covers a wide range of scientific disciplines including the study of plant structure, growth, reproduction, metabolism, development, diseases, chemical properties, evolutionary relationships, and plant taxonomy. Graduates with Botany can work in national and international organization in public and private sectors as Biodiversity Researchers, Environmental Scientists, Nature Reserve Managers, Wildlife Management Advisors, Ecological Consultants and Conservation Officers, Quality Control Officers, Salesperson etc.

2. Objectives

On accomplishing the course, the students will be able to:

- i. Demonstrate comprehensive understanding of Botany as an interdisciplinary and multidisciplinary subject.
- ii. Achieve awareness about the evolutionary trends and plants systematic in pursuit of nature conservation.
- iii. Understand the relationship between economic growth and importance of indigenous plant resources.

3. BS Botany (4 Year)

Eligibility Criteria for admission in BS Programs(4 years) is:

1. Students holding FSC (Pre Medical) or equivalent/ 'A' level with Biology as a major subject shall be eligible for admission.

BS BOTANY (4 Years)

Semester 1			
Code	Course Title	CH	
BIO3507	Cell Biology	3(2+1)	Major
ITHC3501/ HADH3501	Islamic studies/Ethics	2(2+0)	General
PKST3502	Ideology & constitution of Pakistan	2(2+0)	General
MATH3508	Quantitative Reasoning	3(3+0)	General
ENGL3505	Functional English	3(3+0)	General
URD 3503	Pakistani Adab-1	2(2+0)	General (Arts and Humanities)
Bio 3509	Introductory Biochemistry	3(2+1)	Major
	Total Credits	18	
Semester-2			
Code	Course Title	CH	
ENGL3504	Expository Writing	3(3+0)	General
TBA	Fundamentals of Microbiology	3(2+1)	Major

SOC3503	Civics and Community Engagement	2(2+0)	General
CS3503	Application of Information communication & Technologies	3(2+1)	General
MATH4505	Quantitative Reasoning II	3(3+0)	General
SOC3506	Introduction to Sociology	2(2+0)	General
	Total Credits	16	
	Semester-3		
Code	Course Title	CH	
CHEM3501	Inorganic Chemistry	4(3+1)	General
TBA	Diversity of Plants	3(2+1)	Major
ENVS3505	Diversity of Animals	3(2+1)	Major
ENVS4501	Basics of Environmental science	3(2+1)	General (Natural Science)
MGT3503	Entrepreneurship	2(2+0)	General
BIO4504	Genetics and Evolution	3(2+1)	Major
	Total Credits	18	
	Semester 4		
Code	Course Title	CH	
CHEM3502	Organic Chemistry	4(3+1)	General
BIO4505	Biosafety;	3(2+1)	Major

	Principles and applications		
TBA	Biotechnology	3(2+1)	Major
BIO4506	Animal Physiology and Ecology	3(3+0)	Major
BIO4507	Plant Physiology and Ecology	3(3+0)	Major
	Total Credits	16	
	Semester 5		
Code	Course Title	CH	
BIO5509	Diversity of Vascular Plants	3(2+1)	Major
BIO5510	Plant Anatomy	3(2+1)	Major
BIO5511	Phycology and Bryology	3(3+0)	Major
BIO5508	Biodiversity and Conservation	4(3+1)	Major
ENVS3506	Environmental Biology	4(3+1)	Interdisciplinary
TFSR3501	Fahm-e-Quran(Tajwid, Translation & Tafsir		NC
	Total Credits	17	
	Semester 6		
Code	Course Title	CH	
BIO5512	Plant Ecology -I	3(2+1)	Major
BIO5513	Plant Physiology – I	3(2+1)	Major

BIO5507	Molecular Biology	3(3+1)	Major
BIO6513	Plant Systematics	3(2+1)	Major
BIO5514	Mycology and Plant Pathology	3 (2+1)	Major
SERT3501	Seerat -e- Tayyaba	NC	
	Total Credits	15	
	Semester-7		
Code	Course Title	CH	
BIO6508	Plant Ecology -II	3(2+1)	Major
BIO6509	Plant Physiology – II	3 (2+1)	Major
BIO6517	Bioinformatics	3 (2+1)	Interdisciplinary
ENVS3507	Scientific Research and Report writing	3 (3+0)	Major
STAT3506	Biostatistics	3 (3+0)	Interdisciplinary
BIO6516	Bio-membrane and cell signaling	3(3+0)	Interdisciplinary
	Total Credits	18	
	Semester-8		
Code	Course title	CH	
BIO6519	Capstone Project	3(0+3)	Mandatory
BIO6520	Field Experience	3(0+3)	Mandatory
BIO6505	Genetic Engineering	3 (2+1)	Major
BIO6512	Ethnobotany	3 (3+0)	Major
	Total Credits	12	
Total Credit Hours: Semester 5 – 8 =62			

BS Botany (BSc Based)

Eligibility Criteria

1. Students holding a BSc degree with 45% marks shall be eligible for admission.
2. Students with associate degree (14 years of education) having less than 60 credit hours shall be eligible for admission.
3. Students with a discipline-specific associate degree who wish to switch to another discipline shall also be eligible for admission.

Bridging Semester as per 2023 Policy for

BS Biochemistry (2.5 Years)

BS Microbiology (2.5 Years)

BS Botany (2.5 years)

Course Code	Course Title	Ch
TBA	Diversity of Plants	3 (2+1)
TBA	Diversity of Animals	3 (2+1)
TBA	Biotechnology	3 (2+1)
Bio 4505	Biosafety, principle and applications	3 (2+1)
TBA	Introductory Biochemistry	3 (2+1)

TBA	Fundamental of Microbiology	3 (2+1)
Total Ch		18

Total CH for BS Biochemistry 2.5 Years (18+60) =78

Total CH for BS Microbiology 2.5 Years (18+60) =78

Total CH for BS Botany 2.5 Years (18+62) =80

Semester wise lay out for Associate Degree Program (Total CH Semester 1-4 = 68)

Semester 1			
Code	Course Title	CH	
BIO5509	Diversity of Vascular Plants	3(2+1)	Major
BIO5510	Plant Anatomy	3(2+1)	Major
BIO5511	Phycology and Bryology	3(3+0)	Major
BIO5508	Biodiversity and Conservation	4(3+1)	Major
ENVS350	Environmental Biology	4(3+1)	Interdisciplinary
TFSR350	Fahm-e-Quran(Tajwid, Translation & Tafsir		NC

		Total Credits	17
Semester 2			
Code	Course Title	CH	
BIO5512	Plant Ecology -I	3(2+1)	Major
BIO5513	Plant Physiology – I	3(2+1)	Major
BIO5507	Molecular Biology	3(3+1)	Major
BIO6513	Plant Systematics	3(2+1)	Major
BIO5514	Mycology and Plant Pathology	3 (2+1)	Major
SERT350	Seerat -e- Tayyaba	NC	
		Total Credits	15
Semester 3			
Code	Course Title	CH	
BIO6508	Plant Ecology -II	3(2+1)	Major
BIO6509	Plant Physiology – II	3 (2+1)	Major
BIO6517	Bioinformatics	3 (2+1)	Interdisciplinary
ENVS350	Scientific Research and Report writing	3 (3+0)	Major
STAT350	Biostatistics	3 (3+0)	Interdisciplinary
BIO6516	Bio-membrane and cell signaling	3(3+0)	Interdisciplinary
		Total Credits	18

Semester-4			
Code	Course title	CH	
BIO6519	Capstone Project	3(0+3)	Mandatory
BIO6520	Field Experience	3(0+3)	Mandatory
BIO6505	Genetic Engineering	3 (2+1)	Major
BIO6512	Ethnobotany	3 (3+0)	Major
	Total Credits	12	

Total Credit Hours: Semester 5 – 8 =62

8. 3.4 Fee Tariff for 1st Semester Eligibility for BS (AD Based 2 years)

Item	Rates
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.600/-
Per 1 Credit course 2420	Rs. 43560
LAB CHARGES	Rs.3630/-
Total	Rs. 51100/-

4. Mode of Study

4.1 Medium of Instruction

The Medium of Instructions for BS Botany will be English.

4.2 Study Material

Reprinted or compiled course books/lecture handouts will be provided by the University however, the students are advised to consult other reference books recommended by the department.

4.3 Mode of Teaching

- University will provide face to face teaching
- The schedule of classes and dates of submission of assignments will be handed over along with study material.

Assessment and Evaluation:

See page vi

5. Contact Details

Incharge

Department of Biology
Research Complex, 1st Floor, AIOU, H-8, Islamabad
Tel: 051-9057726; Email: biology@aiou.edu.pk

Coordinator BS Botany

Department of Biology, Research Complex, 1st Floor,
AIOU, H-8, Islamabad, Tel: 051 905 7185; Email:
biology@aiou.edu.pk

BS MICROBIOLOGY

2. Introduction

The Department of Biology is well aware of the fact that this is an era of scientific revolutions. Microbiology, which is parallel to molecular biology as well as biotechnology, is an emerging scientific field. Lots of work is being done at international level but Pakistan is still behind in this field. The trained manpower well versed with laboratory techniques and disease diagnostic facilities is limited in the country.

Keeping this in view, the Department of Biology has launched four years BS Programme in Microbiology from the semester Spring, 2009.

This programme is designed to:

- i. Provide skilled laboratory personnel for catering general public needs.
- ii. Provide research atmosphere for the support of laboratory facilities.

3. Objectives

After completing this programme, students will acquire the necessary knowledge based in the area of Bio-medical sciences, which is very important to diagnose the infectious diseases as well as epidemics.

The overall objectives of this programme is to **promote education of Applied/Life Sciences in the country.**

- i. To provide human resources/skilled Microbiologist for catering the needs of medical laboratories in hospitals and research institutes.
- ii. To provide foundation for higher studies in Microbiology.

- iii. To create awareness about application of Microbiology for public benefit.

4. Eligibility Criteria (BS Microbiology 4 years)

F.Sc (Pre-medical) OR Equivalent A Level qualification with Biology as major subject.

5. Duration of Programme

In order to be eligible for the award of BS in Microbiology, the student will have to earn a total of 128 credit hours including three credit hours for research within a minimum period of 4 years (8 semesters) failing which, a student can be given an extension of 2 years (4 semesters) in maximum, after completion of initial period.

6. Scheme of Studies:

Semester 1			
Code	Course Title	CH	
BIO3507	Cell Biology	3(2+1)	Major
ITHC3501/ HADH3501	Islamic studies/Ethics	2(2+0)	General
PKST3502	Ideology & constitution of Pakistan	2(2+0)	General
MATH3508	Quantitative Reasoning-I	3(3+0)	General
ENGL3505	Functional English	3(3+0)	General
URD3503	Pakistani Adab-1	2(2+0)	General (Arts and Humanities)
Bio 3509	Introductory Biochemistry	3(2+1)	Major
	Total Credits	18	
Semester-2			

Code	Course Title	CH	
ENGL3504	Expository Writing	3(3+0)	General
TBA	Fundamentals of Microbiology	3(2+1)	Major
SOC3503	Civics and Community Engagement	2(2+0)	General
CS3503	Application of Information communication & Technologies	3(2+1)	General
MATH4505	Quantitative Reasoning II	3(3+0)	General
SOC3506	Introduction to Sociology	2(2+0)	General
	Total Credits	16	
	Semester-3		
Code	Course Title	CH	
CHEM3501	Inorganic Chemistry	4(3+1)	General
TBA	Diversity of Plants	3(2+1)	Major
ENVS3505	Diversity of Animals	3(2+1)	Major
ENVS4501	Basics of Environmental science	3(2+1)	General (Natural Science)
MGT3503	Entrepreneurship	2(2+0)	General
BIO4504	Genetics and Evolution	3(2+1)	Major
	Total Credits	18	
	Semester 4		
Code	Course Title	CH	

CHEM3502	Organic Chemistry	4(3+1)	General
BIO4505	Biosafety; Principles and applications	3(2+1)	Major
TBA	Biotechnology	3(2+1)	Major
BIO4506	Animal Physiology and Ecology	3(3+0)	Major
BIO4507	Plant Physiology and Ecology	3(3+0)	Major
	Total Credits	16	
	Semester 5		
Code	Course Title	CH	
BIO5518	Applied Environmental Microbiology	3(2+1)	Major
BIO5501	Microbial Genetics	3(2+1)	Major
BIO5502	Virology	3(2+1)	Major
BIO6501	Soil Microbiology	3(2+1)	Major
TBA	Human Physiology	3(2+1)	Major
BIO5519	Biochemical Techniques	3(2+1)	Interdisciplinary
TFSR3501	Fahm-e-Quran(Tajwid, Translation & Tafsir	NC	
	Total credits	18	
	Semester 6		
Code	Course Title	CH	
BIO5507	Molecular Biology	3(2+1)	Major
BIO5506	Antimicrobial and Antiviral Agents	3(2+1)	Major
BIO5505	Food and Dairy	3(2+1)	Major

	Microbiology		
BIO5504	Microbial Anatomy and Physiology	3(2+1)	Major
BIO6504	Industrial Microbiology	3(2+1)	Major
SERT3501	Seerat -e- Tayyaba	NC	
	Total credits	15	
Semester-7			
Code	Course title	CH	
STAT3506	Biostatistics	3(3+0)	Interdisciplinary
ENVS3507	Scientific Research and Report writing	3(2+1)	Interdisciplinary
BIO6503	Immunology	3(2+1)	Major
BIO6502	Medical Microbiology	3(2+1)	Major
BIO6523	Bioinformatics	3(2+1)	Interdisciplinary
	Total credits	15	
Semester-8			
Code	Course title	CH	
BIO6506	Epidemiology	3(2+1)	Major
BIO6519	Capstone Project	3(0+3)	Mandatory
BIO6520	Field Experience	3(0+3)	Mandatory
BIO6505	Genetic Engineering	3(2+1)	Major
	Total credits	12	
Total Credit Hours: Semester 128			

9. Fee Tariff For 1st Semester

Item	Rates
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-

Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.600/-
Per 1 Credit course 2420	Rs. 43560
LAB CHARGES	Rs.3630/-
Total	Rs. 51100/-

7. The fee structure for remaining semesters will be provided in due course of time.

BS MICROBIOLOGY (BSc based)

Eligibility Criteria

1. Students holding a BSc degree with 45% marks shall be eligible for admission.
2. Students with associate degree (14 years of education) having less than 60 credit hours shall be eligible for admission.
3. Students with a discipline-specific associate degree who wish to switch to another discipline shall also be eligible for admission.

Bridging Semester as per 2023 Policy for

BS Biochemistry (2.5 Years)

BS Microbiology (2.5 Years)

BS Botany (2.5 years)

Course Code	Course Title	Ch
TBA	Diversity of Plants	3 (2+1)
TBA	Diversity of Animals	3 (2+1)

TBA	Biotechnology	3 (2+1)
Bio 4505	Biosafety, principle and applications	3 (2+1)
TBA	Introductory Biochemistry	3 (2+1)
TBA	Fundamental of Microbiology	3 (2+1)
Total Ch		18

Total CH for BS Biochemistry 2.5 Years (18+60)=78

Total CH for BS Microbiology 2.5 Years (18+60)=78

Total CH for BS Botany 2.5 Years (18+62)=80

4.1 Scheme of Studies

BS Microbiology (AD-Based)			
Semester 1			
Code	Course Title	CH	
BIO5518	Applied Environmental Microbiology	3(2+1)	Major
BIO5501	Microbial Genetics	3(2+1)	Major
BIO5502	Virology	3(2+1)	Major
BIO6501	Soil Microbiology	3(2+1)	Major
BIO4502	Human Physiology	3(2+1)	Major
BIO5519	Biochemical Techniques	3(2+1)	Interdisciplinary
TFSR3501	Fahm-e-Quran (Tajwid, Translation &	NC	

	Tafsir		
	Total credits	18	
Semester 2			
Code	Course Title	CH	
BIO5507	Molecular Biology	3(2+1)	Major
BIO5506	Antimicrobial and Antiviral Agents	3(2+1)	Major
BIO5505	Food and Dairy Microbiology	3(2+1)	Major
BIO5504	Microbial Anatomy and Physiology	3(2+1)	Major
BIO6504	Industrial Microbiology	3(2+1)	Major
SERT3501	Seerat -e- Tayyaba	NC	
	Total credits	15	
Semester-3			
Code	Course title	CH	
STAT3506	Biostatistics	3(3+0)	Interdisciplinary
ENVS3507	Scientific Research and Report writing	3(2+1)	Interdisciplinary
BIO6503	Immunology	3(2+1)	Major
BIO6502	Medical Microbiology	3(2+1)	Major
BIO6523	Bioinformatics	3(2+1)	Interdisciplinary
	Total credits	15	
Semester-4			
Code	Course title	CH	

BIO6506	Epidemiology	3(2+1)	Major
BIO6519	Capstone Project	3(0+3)	mandatory
BIO6520	Field Experience	3(0+3)	mandatory
BIO6505	Genetic Engineering	3(2+1)	Major
	Total credits	12	
Total Credit Hours: Semester 5 – 8 = 78			

10. Fee Tariff For 1st Semester

Item	Rates
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.600/-
Per 1 Credit course 2420	Rs. 43560
LAB CHARGES	Rs.3630/-
Total	Rs. 51100/-

4.2 5. Mode of Study

4.3 Medium of Instruction

The Medium of Instructions for BS Microbiology will be English.

4.4 Study Material

Lecture handouts will be provided by the department. The students are also advised to consult other reference books recommended by the department.

4.5 Mode of Teaching

- University will provide face to face teaching to the students.
- The schedule of classes and dates of submission of assignments will be announced by the department.

4.6 Assessment and Evaluation

See page vi

4. Contact Details

Incharge

Department of Biology
Research Complex, 1st Floor, AIOU, H-8, Islamabad
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Coordinator BS-Microbiology

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5. Faculty Members

1. Dr. Hina Fatimah

Incharge, Department of Biology
Ph. 051-9575271

2. Dr. Muhammad Waseem

Assistant Professor, Ph. 051-9575274

3. Dr. Rizwana Kousar

Assistant Professor, Ph. 051-9575273

4. **Dr. Sobia Kanwal,**
Assistant Professor, Ph. 051-9575275
5. **Dr. Saba Farooq**
Lecturer, Ph. 051-9575284
6. **Ms. Samar Naseer**
Lecturer, Ph. 051-9057185
7. **Ms. Zainab Syed**
Lecturer, Ph. 051-9575283
8. **Dr. Sadia Latif**
Research Associate, Ph. 051-9575286

DEPARTMENT OF ENVIRONMENTAL SCIENCE

The approval for the establishment of the Department of Environmental Science was granted by the Executive Council in February 1998. The department was initiated with the aim of creating awareness and understanding of knowledge and skills required for sustainable environmental management. The purpose of its establishment is to educate future generation and improvement of quality of life and welfare of human being through research for the environmentally sustainable and socially equitable use of the natural resources. The department is determined to provide quality education to its wards through scientific and project-based learning curriculum.

The Department of Environmental Science is committed to educate its students for sustainable development of society, ensuring economic stability with eco-centric approach of development. The students from different fields can opt environmental sciences not only as a degree of substantial market value but also for their personal development on important moral values of environmental stewardship, so they can contribute significantly in achievement of better and sustainable society.

The Department is continuously growing and flourishing both on quality teaching and research facilities to facilitate its students in better learning. Undoubtedly the current era is a modern new world of environmental challenges that questions the safety and stability of life on earth. Though is developing

labs and faculty, the Department of Environmental Science promises to develop a holistic educational approach for the students to deal with challenges of the modern era.

The Department is offering undergraduate programs:

- i. BS Environmental Science 4- Year Program
- ii. BS Environmental Science 2.5- Year Program
- iii. BS Environmental Science 2- Year Program
- iv. M.Phil. Environmental Science 2-Year Program

The Department has well established lab facilities to foster the developing research ideas of the enrolled students, with competent faculty to guide them.

BS ENVIRONMENTAL SCIENCE

Introduction

The increasing environmental degradation due to urbanization has highlighted the need of Environmental Sciences. It is an integrated discipline designed to provide a comprehensive knowledge of the fundamentals of biological and natural sciences in solving environmental problems. The Environmental Sciences department is currently running BS and MSc Environmental Sciences Program under the Faculty of Science at AIOU. Where currently offers undergraduate program of BS Environmental Science. The courses offered in the department are designed considering the multidisciplinary nature of the discipline and focus on understanding of the fundamental processes that contribute to environmental pollution and natural resource degradation

with the aim to train students to combat pollution and ensure sustainable development in the country.

Graduates from the Department of Environmental Science can find potential opportunities and career in a national and international organization working for sustainable development.

Objectives

The 4 years' degree program will enable the students to apply interdisciplinary skills, systems approaches and perspectives to understand and analyze environmental issues and policies of global and local concerns. It aims at producing dynamic young environmentalists by developing academic foundation, technical skills, communication abilities and professionalism enabling them to compete in both the governmental and non-governmental sectors.

On accomplishing the course, the students will be able to:

- i. Deal with local and global environmental challenges, both academically and practically
- ii. Contribute in informed decision making, strategic planning and leadership in the society through interdisciplinary understanding and problem-solving abilities

BS Environmental Science (4-Year Program)

Eligibility Criteria

- i. F. Sc (pre-Medical) or (pre-Engineering) or equivalent qualification.
- ii. Foreign certificate/ degree holders will need to produce equivalence certificate from IBCC.

Duration of Program

To be eligible for the award of BS in Environmental Science, the student will have to complete 132 credit hours including three credit hours for capstone project, within a minimum period of 4 years (8 semester) failing which a student can be given an extension of two years (4 semester) in minimum, after completion of initial period.

Semester wise lay out for BS Programs (Total CH Semester 1-8 = 132)

Semester I		Course Category	
Course Code	Course Title	CH	
ENGL 3505	Functional English	3 (3+0)	GC
ITHC 3501/ HADH3501	Islamic Studies/ Ethics	2 (2+0)	GC
PKST3502	Ideology and Constitution of Pakistan	2 (2+0)	GC
MATH3508	Quantitative Reasoning	3 (3+0)	QR (GC)
URD3503	Pakistani Adab-I	2 (2+0)	Arts & Humanities (GC)
ENVS4501	Basics of Environmental Science	3 (2+1)	Natural Science
	Credit hours	15	

SEMESTER II			
Course Code	Course Title	CH	
ENGL 3504	Expository Writing	3 (3+0)	GC
SOC3503	Civics and Community Engagement	2 (2+0)	GC
SOC3506	Introduction to Sociology	2(2+0)	GC
MATH4505	Quantitative Reasoning II	3 (3+0)	GC
CS3503	Application of Information and Communication Technologies	3 (2+1)	GC
ENVS 3508	Community Ecology	3(3+0)	Major
	Credit hours	16	
SEMESTER III			
Course Code	Course Title	CH	
MGT3503	Entrepreneurship	2 (2+0)	GC
ENVS4502	Introduction to Earth Sciences	3 (3+0)	Major
ENVS4503	Water and Wastewater Treatment	3 (2+1)	Major
ENVS 5502	Environmental Policies and Regulations	3 (3+0)	Major

ENVS 3502	Environmental Pollution	4 (3+1)	Major
	Credit hours	15	
SEMESTER IV			
Course Code	Course Title	CH	
ENVS4503	Climate Change	4 (3+1)	Major
ENVS 5501	Environmental Chemistry	4(3+1)	Major
ENVS4504	Solid and Hazardous Waste Management	3(3+0)	Major
ENVS 3506	Environmental Biology	4 (3+1)	Major
ENVS4505	Environmental Geography	3(3+0)	Major
	Credit hours	18	
SEMESTER V			
Course Code	Course Title	CH	
BIO 3508	Applies Environmental Microbiology	3 (2+1)	Interdisciplinary
BIO 5508	Biodiversity and Conservation	4 (3+1)	Interdisciplinary
ENVS 5503	Physics of the Environment	4 (3+1)	Major
TFSR3501	Fahm-e-Quran(Tajwid, Translation &	NC	Non-Credit

	Tafsir		
ENVS5507	Analytical Techniques	4 (3+1)	Major
ENVS 5508	Environment Data Visualization & Processing	3(3+0)	Major
	Credit hours	18	
SEMESTER VI			
Course Code	Course Title	CH	
ENVS3507	Scientific Research and Report Writing	3 (2+1)	Major
ENVS 5505	Intro to Environmental Economics	3 (3+0)	Major
ENVS 5504	Natural Resource Management	3 (3+0)	Major
ENVS 5506	Energy and Environment	3 (3+0)	Major
ENVS 6501	Environmental Impact Assessment	4 (3+1)	Major
STAT 3506	Biostatistics	3(3+0)	Interdisciplinary
SERT3501	Seerat-e-Tayyaba	NC	Non-Credit
	Credit hours	19	
SEMESTER VII			
Course Code	Course Title	CH	
ENVS6508	Field Experience/Internship	3 (0+3)	Major

ENVS 6503	Health, Safety & Environmental Management Systems	4(3+1)	Major
ENVS 6502	Sustainable Development	3(3+0)	Major
ENVS 6504	Environmental Toxicology	3(3+0)	Major
BIO3507	Cell Biology	3 (2+1)	Interdisciplinary
	Credit hours	16	
SEMESTER VIII			
Course Code	Course Title	CH	
ENVS6509	Capstone Project	3 (0+3)	Major
ENVS6510	Disaster Risk Reduction and Management	4 (3+1)	Major
ENVS 6506	GIS and Remote Sensing	4 (3+1)	Major
ENVS 6505	Project Management	4 (3+1)	Major
	Credit hours	15	

11. Fee Tariff

Item	Rates
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.600/-

Per 1 Credit course 2420	Rs. 43560
LAB CHARGES	Rs.3630/-
Total	Rs. 51100/-

BS Environmental Science (BA/ BSc or AD Based Program)

Eligibility Criteria

- Students holding a BSc Degree with at least 45% marks shall be eligible for admission.
- Student with Associate Degree in relevant field with less than 60 credit hours.
- Students with a Associate Degree other than the field with 50% marks who wish to switch to another discipline shall also be eligible for admission

Semester wise lay out for BS B.Sc Based Programs (Total CH Semester 86)

SEMESTER I (BRIDGING SEMESTER)			
Course Code	Course Title	Credit hours	
ENVS3508	Community Ecology	3(3+0)	
ENVS 5501	Environmental Chemistry	4(3+1)	
ENVS 3506	Environmental Biology	4 (3+1)	
ENVS 4502	Introduction to Earth Sciences	3(3+0)	
ENVS 4503	Climate Change	4(3+1)	
	Credit hours	18	

SEMESTER V			
Course Code	Course Title	CH	
BIO 3508	Applies Environmental Microbiology	3 (2+1)	Interdisciplinary
BIO 5508	Biodiversity and Conservation	4 (3+1)	Interdisciplinary
ENVS 5503	Physics of the Environment	4 (3+1)	Major
TFSR3501	Fahm-e-Quran(Tajwid, Translation & Tafsir	NC	Non-Credit
ENVS5507	Analytical Techniques	4 (3+1)	Major
ENVS 5508	Environmental Data Visualization & Processing	3(3+0)	Major
	Credit hours	18	
SEMESTER VI			
Course Code	Course Title	CH	
ENVS3507	Scientific Research and Report Writing	3 (2+1)	Major
ENVS 5505	Intro to Environmental Economics	3 (3+0)	Major
ENVS 5504	Natural Resource Management	3 (3+0)	Major
ENVS 5506	Energy and Environment	3 (3+0)	Major

ENVS 6501	Environmental Impact Assessment	4 (3+1)	Major
SERT3501	Seerat-e-Tayyaba	NC	Non-Credit
STAT 3506	Biostatistics	3(3+0)	Interdisciplinary
	Credit hours	19	
SEMESTER VII			
Course Code	Course Title	CH	
ENVS6508	Field Experience/Internship	3 (0+3)	Major
ENVS 6503	Health, Safety & Environmental Management Systems	4(3+1)	Major
ENVS 6502	Sustainable Development	3(3+0)	Major
ENVS 6504	Environmental Toxicology	3(3+0)	Major
BIO3507	Cell Biology	3 (2+1)	Interdisciplinary
	Credit hours	16	
SEMESTER VIII			
Course Code	Course Title	CH	
ENVS6509	Capstone Project	3 (0+3)	Major
ENVS6510	Disaster Risk Reduction and Management	4 (3+1)	Major
ENVS 6506	GIS and Remote Sensing	4 (3+1)	Major

ENVS 6505	Project Management	4 (3+1)	Major
	Credit hours	15	

12. Fee Tariff

Item	Rates
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.600/-
Per 1 Credit course 2420	Rs. 43560
LAB CHARGES	Rs.3630/-
Total	Rs. 51100/-

BS Environmental Science (AD Based)

Eligibility Criteria

Students having associate degree in relevant field with at least 60 credit hours

- Students with an Associate degree in the relevant field with at least 60 credit hours shall be eligible for admission, for the award of BS degree in Environmental Science, the student will have to complete minimum 65 credit hours including six credit hours for research project.

Semester wise lay out for BS Associate Degree Based

Programs (Total CH Semester 5-8 = 68)

SEMESTER V			
Course Code	Course Title	CH	

BIO 3508	Applies Environmental Microbiology	3 (2+1)	Interdisciplinary
BIO 5508	Biodiversity and Conservation	4 (3+1)	Interdisciplinary
ENVS 5503	Physics of the Environment	4 (3+1)	Major
TFSR3501	Fahm-e-Quran(Tajwid, Translation & Tafsir)	NC	Non-Credit
ENVS5507	Analytical Techniques	4 (3+1)	Major
ENVS5508	Environment Data Visualization & Processing	3(3+0)	Major
	Credit hours	18	
SEMESTER VI			
Course Code	Course Title	CH	
ENVS3507	Scientific Research and Report Writing	3 (2+1)	Major
ENVS 5505	Intro to Environmental Economics	3 (3+0)	Major
ENVS 5504	Natural Resource Management	3 (3+0)	Major
ENVS 5506	Energy and Environment	3 (3+0)	Major
ENVS 6501	Environmental Impact Assessment	4 (3+1)	Major
SERT3501	Seerat-e-Tayyaba	NC	Non-Credit

STAT 3506	Biostatistics	3(3+0)	Interdisciplinary
	Credit hours	19	
SEMESTER VII			
Course Code	Course Title	CH	
ENVS6508	Field Experience/Internship	3 (0+3)	Major
ENVS 6503	Health, Safety & Environmental Management Systems	4 (3+1)	Major
ENVS 6502	Sustainable Development	3 (3+0)	Major
ENVS 6504	Environmental Toxicology	3 (3+0)	Major
BIO3507	Cell Biology	3 (2+1)	Interdisciplinary
	Credit hours	16	
SEMESTER VIII			
Course Code	Course Title	CH	
ENVS6509	Capstone Project	3 (0+3)	Major
ENVS6510	Disaster Risk Reduction and Management	4 (3+1)	Major
ENVS 6506	GIS and Remote Sensing	4 (3+1)	Major
ENVS 6505	Project Management	4 (3+1)	Major
	Credit hours	15	

Fee Tariff

Item	Rates
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.600/-
Per 1 Credit course 2420	Rs. 43560
LAB CHARGES	Rs.3630/-
Total	Rs. 51100/-

6.1 Medium of Instruction

The Medium of Instructions for BS Environmental Science will be English.

6.2 Study Material

Reprinted or compiled course books/lecture handouts will be provided by the University as per AIOU policy.

12.3 Mode of Teaching

- University will provide face to face teaching to the students.
- The schedule of classes and dates of submission of assignments will be handed over along with study material.

Assessment and Evaluation:

See page vi

i. Chairperson,

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- ii. **Dr. Samia Qadeer**
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Faculty Members

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- ii. **Dr. Zahid Ullah**
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- iii. **Dr. Samia Qadeer**
Assistant Professor
Ph: 051-9575674

DEPARTMENT OF CHEMISTRY

Department of Chemistry is a major department of the Faculty of Science. It was established in 1998 to offer postgraduate programs in Chemistry. In the beginning only MSc programme was started, which was later extended to include MPhil and PhD programs. The faculty of the department comprises of one Professor, three Associate Professors, four Assistant Professor and three Lecturers. In addition, the department also uses services of experienced professors as visiting faculty.

The department is situated in Science Block on the main campus where it occupies the ground floor and a portion of the lower floor. With the expansion of lab facilities, the department has extended its academic activities by launching the BS programme from Spring, 2009. BS programme is visualized in the new scheme of higher education as a fundamental step in improving the standard of graduate and postgraduate studies.

The study programs in chemistry have been developed by the Faculty according to the guidelines provided by the Higher Education Commission (HEC). Necessary changes have been made time to time to suit our students, but without deviating fundamentally from the principles set by the HEC. The Committee of Courses of the department comprising distinguished professors and scientists of the country thoroughly screened the proposed syllabi.

Chemistry is an experimental science. Students learn basic techniques in the labs. Therefore, it is essential to provide best lab facilities to students of various levels. The chemistry department takes pride in offering the most modern lab facilities in the country to its students in all branches of chemistry. Its research labs are equipped with CHNS Analyzer, Thermal Analyzer, UV-Visible, Fluorescence and FTIR Spectrophotometer, GC-MS, Flash Column Chromatography and HPLC units, Atomic Absorption Spectrometer, and Electrochemical work stations. Teaching labs are well equipped with routine apparatus and basic instruments. These lab facilities make us one of the leading teaching and research departments of the country.

The department firmly believes in the promotion of chemistry as a science and in maintaining the highest standards. The department is in mission to promote chemistry as a science and provide opportunities of professional growth and updating knowledge to chemistry graduates.

BS CHEMISTRY

1 Introduction

There has been a continuous effort at the national level to upgrade the standard of college education. It is realized that our existing BSc programme does not meet international standards. The Higher Education Commission has recommended a four year BS programme to be followed by a two-year MS programme. The BS degree is considered equivalent to MSc Chemistry. However, BS degree holders are given preference for the relevant job over MSc graduates as

their knowledge is more focused on Chemistry. It is a major structural change in our existing educational system. The country will enormously benefit from the fruits of this change in terms of improved and balanced knowledge and skill.

The department of Chemistry offers the best facilities for this programme in the country. Its new labs and modern equipment together with qualified faculty makes it place to which students would like to be a part of it.

2 Objectives

The objectives of this programme are:

- i) To provide a nurturing environment that facilitates and stimulate the active and explorative learning of Chemistry for the students.
- ii) To provide chemical knowledge and laboratory skills required for professional chemist.
- iii) To contribute to national effort in human resource development. Currently department of Chemistry is offering following programs.

3 BS Chemistry (4-year program)

3.1 Eligibility Criteria

- i) FSc with Chemistry as one of the major subject.
- ii) DAE (Diploma Holders) in Chemical Engineering / Chemical Technology from a Polytechnic Institute.
- iii) "A"-Level with Chemistry or Equivalent.

3.2 Duration of Program

The minimum duration of BS Chemistry Programme is **Four years (8 Semesters)** and maximum duration to complete BS Chemistry Programme is **six years (12 Semesters)**.

3.3 Scheme of Studies

The BS program is minimum of four years duration, split into eight semesters. In the first four semesters, the main emphasis will be on basic chemistry, general and compulsory subjects. In the 5th and 6th semesters, Physical, Inorganic, Organic and Analytical Chemistry will be offered as core courses. The specialized courses will be dealt in the 7th and 8th semester with specialization in Organic, Inorganic/Analytical and Physical Chemistry.

Total Credit Hours = 137

Semester Wise	Title of Courses	Alphanumeric Course Code	CH	Category
1 BS 1 st	Fundamentals of Chemistry	CHEM3505	4(3+1)	Major
	Quantitative Reasoning	MATH3508	3(3+0)	General
	Pakistani Adab-1	URD3503	2(2+0)	General
	Ideology and Constitution of Pakistan	PKST3502	2(2+0)	General
	Functional English	ENGL3505	3(3+0)	General
	Islamic Studies/Ethics	ITHC3501 / HADH 3501	2(2+0)	General
	Credits		16	
2 BS 2 nd	Inorganic Chemistry	CHEM3501	4(3+1)	Major
	Quantitative Reasoning -II	MATH4505	3(3+0)	General
	Application of information communication & Technologies	CS3503	3(2+1)	General

	Expository English	ENGL3504	3(3+0)	General
	Civics and Community Engagement	SOC3503	2(2+0)	General
	Basics of Environmental Sciences	ENVS4501	3(2+1)	Natural Sciences
	Credits		18	
3 BS 3 rd	Organic Chemistry	CHEM3502	4(3+1)	Major
	Basic Biochemistry	CHEM4501	4(3+1)	Major
	Environmental Chemistry	ENVS5501	4(3+1)	Major
	Entrepreneurship	MGT3503	2(2+0)	General
	Pre-Calculus	MATH3501	3(3+0)	Interdisciplinary
	Credits		17	
4 BS 4 th	Physical Chemistry	CHEM3503	4(3+1)	Major
	Analytical Chemistry	CHEM3504	3(2+1)	Major
	Statistics for Chemists	STAT3507	4(3+0)	Major
	Calculus – I	MATH3502	3(3+0)	Interdisciplinary
	Introduction to Sociology	SOC3506	2(2+0)	General
	Credits		16	
5	Physical Chemistry – I	CHEM3507	3(3+0)	Major
	Organic Chemistry – I	CHEM3508	3(3+0)	Major
	Inorganic Chemistry – I	CHEM3509	3(3+0)	Major
	Analytical Chemistry-I	Chem 3506	3(3+0)	Major
	Mathematics for Chemists	CHEM3510	2(2+0)	Major

	Chemistry Lab – I	CHEM3511	4(0+4)	Major
	Fahm-e-Quran(Tajwid, Translation & Tafsir)	TFSR3501	NC	
	Credits		18	
6	Analytical Chemistry – II	CHEM5501	3(3+0)	Major
BS 6 th				
	Physical Chemistry – II	CHEM5502	3(3+0)	Major
	Organic Chemistry – II	CHEM5503	3(3+0)	Major
	Inorganic Chemistry – II	CHEM5504	3(3+0)	Major
	Chemistry Lab – II	CHEM5505	4(0+4)	Major
	Seerat-e-Tayyaba	SERT3501	NC	
	Credits		16	
7 th Specialization: Organic Chemistry	Heterocyclic Chemistry	CHEM6501	3(3+0)	Major
	Stereochemistry of Organic Compounds	CHEM6502	3(3+0)	Major
	Spectroscopic Methods in Organic Chemistry	CHEM6503	3(3+0)	Major
	Advanced Organic Chemistry Lab-I	CHEM6504	3(0+3)	Major
	Field Experience/Internship	CHEM6531	3(0+3)	Major
	Scientific Research	ENVS3507	3(2+1)	ID
	Credits		18	
8 th Specialization:	Chemistry of Natural Products	CHEM6516	3(3+0)	Major

on: Organic Chemistry	Special Organic Reactions	CHEM 6517	3(3+0)	Major
	Organic Synthesis	CHEM 6518	3(3+0)	Major
	Advanced Organic Chemistry Lab-II	CHEM 6505	3(0+3)	Major
	Capstone Project	CHEM 6532	3(0+3)	Major
	Water and Wastewater Treatment		3(2+1)	ID
Credit			18	

7 th Specialization: Inorganic / Analytical Chemistry	Coordination Chemistry	CHEM6506	3(3+0)	Major
	Non-Spectroscopic Instrumental Methods of Analysis	CHEM6507	3(3+0)	Major
	Basic Instrumental Methods of Analysis	CHEM6508	3(3+0)	Major
	Advanced Inorganic Chemistry Lab – I	CHEM6509	3(0+3)	Major
	Field Experience/Internship	CHEM6531	3(0+3)	Major
	Scientific Research	ENVS3507	3(2+1)	ID
	Credits		18	
8 th Specialization: Inorganic / Analytical Chemistry	Organometallic Chemistry	CHEM6521	3(3+0)	Major
	Group Theory for Chemist and Its Applications	CHEM6522	3(3+0)	Major
	Advanced Environmental Chemistry	CHEM6523	3(3+0)	Major
	Advanced Inorganic Chemistry	CHEM6510	3(0+3)	Major

	Lab – II			
	Capstone Project	CHEM6532	3(0+3)	Major
	Water and Wastwater Treatment	TBA	3(2+1)	ID
	Credits		18	

7 th Specialization: Physical Chemistry	Chemical Kinetics	CHEM6511	3(3+0)	Major
	Quantum Chemistry	CHEM6512	3(3+0)	Major
	Electrochemistry	CHEM6513	3(3+0)	Major
	Advanced Physical Chemistry Lab – I	CHEM6514	3(0+3)	Major
	Field Experience/ Internship	CHEM6531	3(0+3)	Major
	Scientific Research	ENVS3507	3(2+1)	ID
	Credits		18	
8 th Specialization: Physical Chemistry	Molecular Spectroscopy	CHEM6526	3(3+0)	Major
	Chemical Thermodynamics	CHEM6527	3(3+0)	Major
	Surface Chemistry	CHEM6528	3(3+0)	Major
	Advanced Physical Chemistry Lab – II	CHEM6515	3(0+3)	Major
	Capstone Project	CHEM6532	3(0+3)	Major
	Water and	TBA	3(2+1)	ID

	Wastwater Treatment			
	Credits		18	

3.4 Fee Tariff

Item	
Registration Fee:	Rs.600/-
Admission Fee:	Rs.1210/-
Degree Fee (Once at time of admission)	Rs. 1500
Technology Fee (per semester)	Rs.600/-
Course Code / Lab	Fee
BIO3501	Rs.9680/-
CHEM3505	Rs.9680/-
MATH3501	Rs.7260/-
ENGL3501	Rs.7260/-
PKST3501	Rs.4840/-
Lab fee (per semester)	Rs.7260/-
First Semester Fee	Rs.49490/-

4 BS Chemistry (BSc Based)

Eligibility Criteria for BS Programs (BSc/AD Based with less than 60 credit hours) with Bridging Semester:

1. Students holding a BSc degree with 45% marks shall be eligible for admission.
2. Students with an Associate degree with 50% marks (14 years of education) having less than 60 credit hours shall be eligible for admission.
3. Students with a discipline-specific Associate degree with 50% marks who wish to switch to another discipline shall also be eligible for admission.

4.2 Duration of Programme

The minimum duration of BS Chemistry Programme is 2.5 years 5 Semesters and maximum duration to complete BS program in **4 years**.

4.3 Scheme of Studies

The BS programme is minimum of 2.5 years duration, split into five semesters. In the bridging semester, the main emphasis will be on basic chemistry courses with one mathematic course. In the 2nd and 3rd semesters, Physical, Inorganic, Organic and Analytical Chemistry will be offered as core courses. The specialized courses will be dealt in the 4th and 5th semester with specialization in Organic, Inorganic/Analytical and Physical Chemistry.

SEMESTER WISE COURSE OFFERING

Total Credit Hours = 88

Bridging Semester				
	Analytical Chemistry	CHEM3504	3(2+1)	Major
	Inorganic Chemistry	CHEM3501	4(3+1)	Major
	Organic Chemistry	CHEM3502	4(3+1)	Major
	Physical Chemistry	CHEM3503	4(3+1)	Major
	Pre-Calculus	MATH3501	3(3+0)	ID
	Credits		18	
5	Analytical Chemistry – I	CHEM3506	3(3+0)	Major

BS 5 th	Physical Chemistry – I	CHEM3507	3(3+0)	Major
	Organic Chemistry – I	CHEM3508	3(3+0)	Major
	Inorganic Chemistry – I	CHEM3509	3(3+0)	Major
	Mathematics for Chemists	CHEM3510	2(2+0)	Major
	Chemistry Lab – I	CHEM3511	4(0+4)	Major
	Fahm-e-Quran(Tajwid, Translation & Tafsir	TFSR3501	NC	
	Credits		18	
6 BS 6 th	Analytical Chemistry – II	CHEM5501	3(3+0)	Major
	Physical Chemistry – II	CHEM5502	3(3+0)	Major
	Organic Chemistry – II	CHEM5503	3(3+0)	Major
	Inorganic Chemistry – II	CHEM5504	3(3+0)	Major
	Chemistry Lab – II	CHEM5505	4(0+4)	Major
	Seerat-e-Tayyaba	SERT3501	NC	
	Credits		16	
7 th Specialization: Organic Chemistry	Heterocyclic Chemistry	CHEM6501	3(3+0)	Major
	Stereochemistry of Organic Compounds	CHEM6502	3(3+0)	Major
	Spectroscopic Methods in Organic	CHEM6503	3(3+0)	Major

	Chemistry			
	Advanced Organic Chemistry Lab-I	CHEM6504	3(0+3)	Major
	Field Experience/Internship	CHEM6531	3(0+3)	Major
	Scientific Research	ENVS3507	3(2+1)	ID
	Credits		18	
8 th Specialization: Organic Chemistry	Chemistry of Natural Products	CHEM6516	3(3+0)	Major
	Special Organic Reactions	CHEM6517	3(3+0)	Major
	Organic Synthesis	CHEM6518	3(3+0)	Major
	Advanced Organic Chemistry Lab – II	CHEM6505	3(0+3)	Major
	Capstone Project	CHEM6532	3(0+3)	Major
	Water and Wastwater Treatment	TBA	3(2+1)	ID
	Credits		18	

7 th Specialization: Inorganic / Analytical Chemistry	Coordination Chemistry	CHEM6506	3(3+0)	Major
	Non-Spectroscopic Instrumental Methods of Analysis	CHEM6507	3(3+0)	Major
	Basic Instrumental Methods of Analysis	CHEM6508	3(3+0)	Major
	Advanced Inorganic Chemistry Lab – I	CHEM6509	3(0+3)	Major
	Field Experience/Internship	CHEM6531	3(0+3)	Major
	Scientific Research	ENVS3507	3(2+1)	ID
	Credits		18	
8 th Specialization: Inorganic / Analytical	Organometallic Chemistry	CHEM6521	3(3+0)	Major
	Group Theory for Chemist and Its	CHEM6522	3(3+0)	Major

Chemistry	Applications			
	Advanced Environmental Chemistry	CHEM6523	3(3+0)	Major
	Advanced Inorganic Chemistry Lab – II	CHEM6510	3(0+3)	Major
	Capstone Project	CHEM6532	3(0+3)	Major
	Water and Wastwater Treatment		3(2+1)	ID
	Credits		18	

7 th Specialization: Physical Chemistry	Chemical Kinetics	CHEM6511	3(3+0)	Major
	Quantum Chemistry	CHEM6512	3(3+0)	Major
	Electrochemistry	CHEM6513	3(3+0)	Major
	Advanced Physical Chemistry Lab – I	CHEM6514	3(0+3)	Major
	Field Experience/Internship	CHEM6531	3(0+3)	Major
	Scientific Research	ENVS3507	3(2+1)	ID
	Credits		18	
8 th Specialization: Physical Chemistry	Molecular Spectroscopy	CHEM6526	3(3+0)	Major
	Chemical Thermodynamics	CHEM6527	3(3+0)	Major
	Surface Chemistry	CHEM6528	3(3+0)	Major
	Advanced Physical Chemistry Lab – II	CHEM6515	3(0+3)	Major
	Capstone Project	CHEM6532	3(0+3)	Major
	Water and Wastwater Treatment	TBA	3(2+1)	ID
	Credits		18	

4.4 Fee Tariff

Item	
Registration Fee:	Rs.600/-
Degree Fee (once at time of admission)	Rs. 1500/-
Admission Fee:	Rs.1210/-
Technology Fee (per semester)	Rs.600/-
Course Code / Lab	Fee
CHEM3501	Rs.9680/-
CHEM3502	Rs.9680/-
CHEM3503	Rs.9680/-
CHEM3504	Rs.7260/-
MATH3501	Rs.7260/-
Lab fee (per semester)	Rs.7260/-
First Semester Fee	Rs.54730/-

BS Chemistry (AD Based)

Eligibility Criteria

Students with an Associate degree in the relevant field with at least 60 credit hours shall be eligible for admission.

5.2 Duration of Program

The minimum duration of BS Chemistry Program is **2 years (4 Semesters) and maximum** duration to complete BS Chemistry (AD Based) program is 4 years (8 semester)

SEMESTER WISE COURSE OFFERING

Total Credit Hours = 70

5 BS 5 th	Analytical Chemistry – I	CHEM3506	3(3+0)	Major
	Physical Chemistry – I	CHEM3507	3(3+0)	Major
	Organic Chemistry – I	CHEM3508	3(3+0)	Major
	Inorganic Chemistry – I	CHEM3509	3(3+0)	Major
	Mathematics for	CHEM3510	2(2+0)	Major

	Chemists			
	Chemistry Lab – I	CHEM3511	4(0+4)	Major
	Fahm-e-Quran (Tajwid, Translation & Tafsir)	TFSR3501	NC	
	Credits		18	
6 BS 6 th	Analytical Chemistry – II	CHEM5501	3(3+0)	Major
	Physical Chemistry – II	CHEM5502	3(3+0)	Major
	Organic Chemistry – II	CHEM5503	3(3+0)	Major
	Inorganic Chemistry – II	CHEM5504	3(3+0)	Major
	Chemistry Lab – II	CHEM5505	4(0+4)	Major
	Seerat-e-Tayyaba	SERT3501	NC	
	Credits		16	
7 th Specialization: Organic Chemistry	Heterocyclic Chemistry	CHEM6501	3(3+0)	Major
	Stereochemistry of Organic Compounds	CHEM6502	3(3+0)	Major
	Spectroscopic Methods in Organic Chemistry	CHEM6503	3(3+0)	Major
	Advanced Organic Chemistry Lab-I	CHEM6504	3(0+3)	Major
	Field Experience/Internship	CHEM6531	3(0+3)	Major
	Scientific Research	ENVS3507	3(2+1)	ID
	Credits		18	
8 th Specialization: Organic Chemistry	Chemistry of Natural Products	CHEM6516	3(3+0)	Major
	Special Organic Reactions	CHEM6517	3(3+0)	Major
	Organic Synthesis	CHEM6518	3(3+0)	Major
	Advanced Organic	CHEM6505	3(0+3)	Major

	Chemistry Lab – II			
	Capstone Project	CHEM6532	3(0+3)	Major
	Water and Wastwater Treatment	TBA	3(2+1)	ID
	Credits		18	

7 th Specialization: Inorganic / Analytical Chemistry	Coordination Chemistry	CHEM6506	3(3+0)	Major
	Non-Spectroscopic Instrumental Methods of Analysis	CHEM6507	3(3+0)	Major
	Basic Instrumental Methods of Analysis	CHEM6508	3(3+0)	Major
	Advanced Inorganic Chemistry Lab – I	CHEM6509	3(0+3)	Major
	Field Experience/Internship	CHEM6531	3(0+3)	Major
	Scientific Research	ENVS3507	3(2+1)	ID
	Credits		18	

8 th Specialization: Inorganic / Analytical Chemistry	Organometallic Chemistry	CHEM6521	3(3+0)	Major
	Group Theory for Chemist and Its Applications	CHEM6522	3(3+0)	Major
	Advanced Environmental Chemistry	CHEM6523	3(3+0)	Major
	Advanced Inorganic Chemistry Lab – II	CHEM6510	3(0+3)	Major
	Capstone Project	CHEM6532	3(0+3)	Major
	Water and Wastwater Treatment	TBA	3(2+1)	ID
	Credits		18	

7 th Specialization: Physical	Chemical Kinetics	CHEM6511	3(3+0)	Major
	Quantum Chemistry	CHEM6512	3(3+0)	Major
	Electrochemistry	CHEM6513	3(3+0)	Major

Chemistry	Advanced Physical Chemistry Lab – I	CHEM6514	3(0+3)	Major
	Field Experience/Internship	CHEM6531	3(0+3)	Major
	Scientific Research	ENVS3507	3(2+1)	ID
	Credits		18	
8 th Specialization: Physical Chemistry	Molecular Spectroscopy	CHEM6526	3(3+0)	Major
	Chemical Thermodynamics	CHEM6527	3(3+0)	Major
	Surface Chemistry	CHEM6528	3(3+0)	Major
	Advanced Physical Chemistry Lab – II	CHEM6515	3(0+3)	Major
	Capstone Project	CHEM6532	3(0+3)	Major
	Water and Wastwater Treatment	TBA	3(2+1)	ID
	Credits		18	
Total Credit Hours: Semester 5 –84 = 64				

5.4 Fee Tariff

Item	
Registration Fee:	Rs.600/-
Admission Fee:	Rs.1210/-
Degree Fee (once at time of admission)	Rs. 1500/-
Technology Fee (per semester)	Rs.600/-
Course Code / Lab	Fee
Analytical Chemistry-1	Rs.7260/-
Physical Chemistry-1	Rs.7260/-
Organic Chemistry -1	Rs.7260/-
Inorganic Chemistry-1	Rs.7260/-
Mathematics for Chemists	Rs.4840/-
Lab fee (per semester)	Rs.7260/-
First Semester Fee	Rs.45050/-

6.1 Medium of Instruction

The Medium of Instructions for BS Chemistry will be English.

6.2 Study Material

The Class Teacher will provide the study material as per AIOU policy and will suggest reference books for further reading.

6.3 Mode of Teaching

In this programme, regular classes for all courses / practical work will be conducted at AIOU Main Campus in Face to Face mode. Minimum 70% attendance is required for all subjects as per AIOU rules. AIOU has adopted GPA/CGPA system from Spring Semester 2009 in all its four years Bachelor Degree programs.

6.4 Assessment and Evaluation

See page vi

8 Contact Details

Chairperson

Department of Chemistry,
Science Block

Allama Iqbal Open University, H-8, Islamabad.

Contact Ph: 051-9057818

BS Programme Coordinator

Department of Chemistry,
Science Block

Allama Iqbal Open University, H-8, Islamabad.

Contact Ph: 051-9057262

9. Faculty Members

1. Dr. Uzma Yunus

Associate Professor /Chairperson

Ph: 051-9575200

2. Dr. Moazzam H. Bhatti

Professor

Ph: 051-9575217

3. Dr. Nasima Arshad

Associate Professor

Ph: 051-9575218

4. Dr. Muhammad Sher

Associate Professor

Ph: 051-9575219

5. Dr. Muhammad Zaman Ashraf

Assistant Professor

Ph: 051-9575224

6. Dr. Iqbal Ahmed

Assistant Professor

Ph: 051-9575223

7. Dr. Muhammad Naeem Khan

Assistant Professor

Ph: 051-9575225

8. Dr. Muhammad Saleem

Assistant Professor

Ph: 051-9575226

9. Dr. Mehwash Zia

Lecturer

Ph: 051-9575231

10. Dr. Farzana Shaheen

Lecturer

Ph: 051-9575232

11. Dr. Erum Jabeen

Lecturer

Ph: 051-9575234

DEPARTMENT OF MATHEMATICS

Our vision is to be among the leading Mathematics departments of the country, which provides quality education in Mathematics and is the center of active and innovative research. The department aspires to promote understanding of Mathematics through teaching and research and inculcate in students the attributes of logical and critical thinking. The Department of Mathematics has been established in June 2014. In June 2014, the Department of Mathematics & Statistics has been bifurcated as two independent departments.

Mathematical life at AIOU is very active. It comprises original investigations, discussions, lectures, and teaching at many levels. We are deeply committed to superior research in mathematics and the scientific excellence of our faculty is well recognized in the mathematical community.

The following degree programs are being offered in the Department of Mathematics. All these programs are approved by Higher Education Commission (HEC), Islamabad.

- i. PhD Mathematics
- ii. MPhil Mathematics
- iii. BS Mathematics

Presently, these degree programs are offered at main campus only. However, in near future, the Department intends to offer these degree programs at main regional headquarters.

The Department provides instructional support to all the faculties of the University in the teaching of courses related to Mathematical sciences. Presently, the Department is offering courses for post-graduate and graduate programs which are carefully designed with a thoughtful selection of courses from applied, pure, financial, and computational domains of mathematics in the light of guidelines provided by the HEC.

The Department offers programs in various specializations which include Pure, Applied, Computational and Financial Mathematics. Academia and students frequently participate in national, regional and international conferences. The research interests of the Department of Mathematical Sciences range from abstract to applied aspects of the discipline. Building on our current strength, our goal is to strengthen areas related to Pure and Applied Mathematics. We believe that it will help students keep pace with the latest trends in mathematics on the one hand and contribute to society at large on the other. A clearer idea of the exact areas engaging the Department's current interest can be formed from the list of the faculty and their individual areas of research.

BS MATHEMATICS

1. Introduction

BS Mathematics has been designed after consulting syllabi of national and international universities. BS Mathematics program will strengthen the mathematical concepts of the candidate and will enhance their logical thinking. This

program caters the needs of information Technology and other sciences disciplines.

To meet the challenging requirements of today's fast growing world, the department of Mathematics has planned to launch BS Mathematics Program. The BS degree is deemed equivalent to MSc Mathematics. BS degree holders are being preferred throughout the world as their knowledge is more focused on Mathematics. Our BS Mathematics program will produce well trained, highly numerate and computer literate graduates.

2. Objectives

After completing this program, students will acquire the necessary knowledge based in the area of Mathematics. The overall objective of this program is

- i. To enhance the qualification of those who could not continue their education after F. Sc. through formal universities.
- ii. To provide an opportunity to in service persons to improve their qualification and get promotion in their respective departments.
- iii. To provide in-depth understanding of Mathematics and apply them in real life projects.
- iv. To produce quality teacher/researchers of Mathematics at all levels.

There are three types of BS-Mathematics program being offered depending upon their eligibility criteria and duration of the program.

3. BS Mathematics (4-Year Program)

▪ Eligibility Criteria

Candidate must have FSc/HSSC certificate in HSSC with major Mathematics or equivalent exams approved/verified by Inter Board Committee of Chairmen (IBCC).

▪ Duration of Program

For the award of BS degree in Mathematics, the student will have to earn a total of 126 credit hours within a minimum period of **4 years (8 semesters)**. The maximum period to complete program is **6 years (12 semesters)**.

▪ Scheme of Study (BS math 4years)

S#	Course Title	Code	CH	Category: General Education Cluster (GE)
Semester I				
1.	Functional English	ENGL3505	3(3+0)	GE: Functional English
2.	Islamic Studies/Ethics	ITHC3501/ HADH3501	2(2+0)	GE: Islamic Studies
3.		PKST3502	2(2+0)	GE: Ideology and Constitution of Pakistan
4.		STAT3501	3(3+0)	GE: Ideology and Constitution of Pakistan
5.		URD3503	2(2+0)	GE: Ideology and Constitution of Pakistan
6.	Ideology and Constitution of Pakistan	MATH3502	3(3+0)	GE: Ideology and Constitution of Pakistan
	Introductory Statistics		15	GE: Arts and Humanities
	Pakistani Adab - I			Major
	Calculus-I			
Semester II				
1.	Expository Writing	ENGL3504	3(3+0)	GE: Expository Writing
2.	Civics and Community	SOC3503	2(2+0)	GE: English
3.	Engagement	CS3503	3(2+1)	GE: Civics and Community
4.	Engagement	SOC3506	2(2+0)	GE: Civics and Community
5.	Application of Information Communication & Technologies	MATH3509	3(3+0)	GE: Engagement
6.		MATH3507	3(3+0)	GE: Applications of ICT
			16	GE: Social Sciences
				Major

	Introduction to Sociology Calculus-II Set Theory & Logic			Major
Semester III				
1.	Quantitative Reasoning-I	MATH3508	3(3+0)	GE: Quantitative Reasoning
2.	Entrepreneurship	MGT3503	2(2+0)	GE:
3.	Basics of	ENVS4501	3(2+1)	Entrepreneurship
4.	Environmental Science	MATH3512	3(3+0)	GE: Natural Sciences
5.	Linear Algebra	MATH4502	3(3+0)	Major
6.	Analytical Geometry	MATH3505	17	Major
	Discrete Mathematics-I			Major
Semester IV				
1.	Quantitative Reasoning-II	MATH4505	3(3+0)	GE: Quantitative Reasoning
2.	Introduction to Probability and	STAT3503	3(3+0)	Interdisciplinary
3.	Probability	MATH4504	3(3+0)	Major
4.	Distributions	MATH4503	3(3+0)	Major
5.	Mathematical Methods	MATH3510	3(2+1)	Major
6.	Vector and Tensor Analysis	MATH3512	3(3+0)	Major
	Computer and Scientific Applications		18	Major
	Group Theory			
Semester V				
1.	Real Analysis-I	MATH3513	3(3+0)	Major
2.	Ordinary Differential	MATH3514	3(3+0)	Major
3.	Equations	MATH5501	3(3+0)	Major
4.	Equations	PHY3509	3(3+0)	Interdisciplinary
5.	Differential	CS5501	3(3+0)	Interdisciplinary

6.	Geometry Waves and Oscillations Machine Learning Fahm-e-quran (Tajwid, translation and Tafsir)	TFSR3501	NC 15	Mandatory Non-credit Course
Semester VI				
1.	Topology	MATH3511	3(3+0)	Major
2.	Complex Analysis	MATH5502	3(3+0)	Major
3.	Analytical Mechanics	MATH5504	3(3+0)	Major
4.	Real Analysis-II	MATH5505	3(3+0)	Major
5.	Applied Number Theory	MATH6510	3(3+0)	Major
6.	Seerat-e-Tayyaba	SERT3501	NC 15	Mandatory Non-credit Course
Semester VII				
1.	Numerical Methods	MATH6501	3(2+1)	Major
2.	Partial Differential Equations	MATH6502	3(3+0)	Major
3.	Functional Analysis	MATH6503	3(3+0)	Major
4.	Theory of Rings	MATH6504	3(3+0)	Major
5.	Field Experience/Internship	MATH6523	3(0+3) 15	Mandatory
Semester VIII				
1.	Capstone Project	MATH6524	3(0+3)	Mandatory
2.	Optional-I		3(3+0)	Major
3.	Optional-II		3(3+0)	Major
4.	Optional-III		3(3+0)	Major
5.	Optional-IV		3(3+0) 15	Major

Total Credit Hours: = 126

▪ **Fee Tariff**

Item	
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs.600/-
Per 1 Credit hours fee: Rs. 2420	Rs. 36300
Lab Fee (Per Semester)	Rs.935/-
Total	Rs. 4145/-

4. BS Mathematics (BA/ BSC Based)

Eligibility Criteria

1. Students holding a BSc degree with 45% marks shall be eligible for admission.
 2. Students with an Associate degree (14 years of education) having less than 60 credit hours shall be eligible for admission.
- Students with a discipline-specific Associate degree who wish to switch to another discipline shall also be eligible for admission.

▪ **Duration of Program**

The students would be allowed to continue with BS-Mathematics in 5th semester after completing bridging semester which comprises of 18 credit hours of foundation courses. The Student will have to earn a total of 78 credit hours within a minimum period of 2.5 years and maximum of 4 years.

Scheme of Study

S#	Bridging Semester		
1.	Set Theory & Logic	MATH3507	3(3+0)
2.	Linear Algebra	MATH3512	3(3+0)
3.	Introduction to Probability and	STAT3503	3(3+0)

	Probability Distributions		
4.	Mathematical Methods	MATH4504	3(3+0)
5.	Vector and Tensor Analysis	MATH4503	3(3+0)
6.	Computer and Scientific Applications	MATH3510	3(2+1)
			18

Offering of Bridging Semester for BSc/Associate Degree holders without mathematics

To cater the students without mathematics background, the department proposed a bridging semester for associate degree holders with less than 60 credit hours and BSc pass students within which the students will study the deficiency courses in mathematics. The proposed scheme for the bridging semester is as under:

S#	Bridging Semester		
1.	Set Theory & Logic	MATH3507	3(3+0)
2.	Linear Algebra	MATH3512	3(3+0)
3.	Introduction to Probability and Probability Distributions	STAT3503	3(3+0)
4.	Mathematical Methods	MATH4504	3(3+0)
5.	Vector and Tensor Analysis	MATH4503	3(3+0)
6.	Computer and Scientific Applications	MATH3510	3(2+1)
			18
Semester V			

1.	Real Analysis-I	MATH3513	3(3+0)	Major
2.	Ordinary	MATH3514	3(3+0)	Major
3.	Differential	MATH5501	3(3+0)	Major
4.	Equations	PHY3509	3(3+0)	Interdisciplinary
5.	Differential	CS5501	3(3+0)	Interdisciplinary
6.	Geometry		NC	Mandatory Non-credit Course
	Waves and Oscillations	TFSR3501	15	
	Machine Learning			
	Fahm-e-quran (Tajwid, translation and Tafsir)			
Semester VI				
1.	Topology	MATH3511	3(3+0)	Major
2.	Complex Analysis	MATH5502	3(3+0)	Major
3.	Analytical Mechanics	MATH5504	3(3+0)	Major
4.	Real Analysis-II	MATH5505	3(3+0)	Major
5.	Applied Number Theory	MATH6510	3(3+0)	Major
6.	Seerat-e-Tayyaba	SERT3501	NC 15	Mandatory Non-credit Course
Semester VII				
1.	Numerical Methods	MATH6501	3(2+1)	Major
2.	Partial Differential	MATH6502	3(3+0)	Major
3.	Equations	MATH6503	3(3+0)	Major
4.	Functional Analysis	MATH6504	3(3+0)	Major
5.	Theory of Rings Field Experience/Internship	MATH6523	3(0+3) 15	Mandatory
Semester VIII				
1.	Capstone Project	MATH6524	3(0+3)	Mandatory
2.	Optional-I		3(3+0)	Major
3.	Optional-II		3(3+0)	Major
4.	Optional-III		3(3+0)	Major
5.	Optional-IV		3(3+0)	Major
			15	

Fee Tariff

Item	
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs.600/-
Per 1 Credit hours fee: Rs.2420	Rs. 43560
Lab Fee (Per Semester)	Rs.935/-
Total	Rs. 46905/-

5. BS Mathematics AD Based

Eligibility Criteria

- Students with associate degree in the relevant field with at least 60 credit hours shall be eligible for admission.

Item	
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs.600/-
Per 1 Credit hours fee: Rs. 2420	Rs. 36300
Lab Fee (Per Semester)	Rs.935/-
Total	Rs. 41145/-

5. Medium of Instruction

The Medium of Instructions for BS Mathematics will be English.

▪ **Study Material**

Lecture handouts will be provided by the concerned resource person/department however, the students are advised to consult the other reference books recommended by the resource person.

▪ **Mode of Teaching**

The classes will be conducted face-to-face in the main campus of AIOU.

Student progress will be assessed based on the followings:

Continuous Assessment

See page vi

Contact Details

For further information, contact:

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Faculty of Sciences, Block # 7,
Allama Iqbal Open University
Phone: 051-9575700

ii. Coordinator BS-Mathematics

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9. Faculty Members

1. Dr. Nasir Rehman

Associate Professor
Chairman, Department of Mathematics

Ph. 051-9575700

2. Dr. Zahid Iqbal

Associate Professor
Ph. 051-957571

3. Dr. Irfan Mustafa

Assistant Professor
Ph. 051-9575723

4. Dr. Muhammad Nazam

Lecturer
Ph. 051-9575731

5. Dr. Bismah Jamil

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Ph. 051-957 5732

6. Dr. Muhammad Faisal Iqbal

Lecturer
Ph. 051-9575746

7. Mr. Rizwan Salim Badar

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Research Associate
Ph. 051-9575735

9. Ms. Fouzia Rehman

Research Associate
Ph. 051-9575736

DEPARTMENT OF PHYSICS

Realizing the need of technology and scientific education in Pakistan Department of Physics at AIOU was established in 1998 with technological needs in areas like Energy, Energy Efficiency, Climate, and Energy for Sustainable Development, Renewable Energy, Hydrogen Energy, Environment, Astronomy, Nanotechnology, Materials Science, Plasma Physics, Medical Physics, Cosmology, Geo Physics, Density Functional Theory (DFT), and Nuclear fields. A major emphasis of current research activities is on promotion of renewable energy and related areas in which the Department has led to innovations.

The Department is presently running BS 2-year, BS 2.5-year, BS 4- year, MPhil, and PhD degree programs with specialization in various disciplines. Apart from capacity development, activities Department of Physics has been involved in several international, national, and regional research projects. The Physics Department has developed research linkage with other National and International Universities and research organizations of repute to ensure two-way flow of knowledge.

BS PHYSICS

Introduction

The Department of Physics offer 2-year, 2.5-year and 4- year BS Physics degree programs. These programs are designed according to the scheme of studies approved by the Higher Education Commission (HEC) of Pakistan to meet the national and international standards.

It covers all aspects of Physics ranging from its foundations to modern research. The offered courses have a flexible curriculum that is capable of preparing students for advanced studies in Physics as well as careers in teaching and research institutes. The Department encourages the students to participate in research projects and provides them with possible facilities and guidance. In addition, students could participate in the activities of different university societies, attend departmental seminars, workshops and conferences.

Objectives

The main educational objectives of BS degree programs are:

- i. To impart students with a conceptual understanding of the fundamental principles of Physics, natural laws, and their interpretation, as well as mathematical formulation of the physical phenomena in nature.
- ii. To develop critical skills necessary for solving unknown problems from our physical surroundings.
- iii. To develop the capability of analyzing, addressing, and posing solutions to problems of natural importance and to instill a deep appreciation of the need for optimum utilization of natural resources and environment.
- iv. To instill in students the habit of independent thinking, deep inquiry, and motivation for self-education.
- v. To sharpen our students' mathematical prowess making them capable of modeling, analyzing, and predicting the behavior of physical processes.
- vi. To enhance our students' skills in scientific communication and the ability to clearly present Physics and science in simple and clear language.

- vii. To introduce students with the spirit of working in interactive groups with the necessary requirements of scientific and professional ethics.
- viii. To develop hands-on experience in different laboratory techniques and modern instrumentation.
- ix. To enhance students' competence in the design and conduct of experiments as well as analysis and presentation of experimental data and results.
- x. To provide an in-depth understanding of some specialized areas of Physics through the option of elective courses.
- xi. To equip students with the necessary skill set for pursuing careers in Physics education, research and industry in government or private organizations.

BS Physics (4-year)

3.1. Eligibility Criteria

FSc. (Pre-Engineering/Pre-Medical), ICS (Physics, Mathematics combination) / DAE .

3.2. Duration of Program

The minimum duration of BS Physics Program is **four years (8 Semesters)** and maximum duration to complete BS Physics Program is **six years (12 semesters)**.

2.3. Scheme of Studies

PROPOSED SCHEME OF STUDIES BS PHYSICS

Revised Scheme of Studies				Category
No.	Code	Title	Cr.H.	
1 st	ENGL3505	Functional English	3(3+0)	GE/ENG

2 nd Semester	PKST3502	Ideology and Constitution of Pakistan	2(2+0)	GE/PKST	
	MATH3502	Calculus-I	3(3+0)	GE/QR-I	
	URD3503	Pakistani Adab-I	2(2+0)	GE/A&H	
	PHY3501	Mechanics	4(3+1)	MAJOR	
	ITHC3501/ADH3501	Islamic Studies or Ethics (for non-Muslim students only)	2(2+0)	GE/IST	
	CS6505	Computer Programming: C&C++	3(3+0)	ID	
	Total			19	
	MATH3509	Calculus-II	3(3+0)	GE/QR-II	
	ENGL3504	Expository Writing	3(3+0)	GE/ENG	
	PHY3505	Electricity & Magnetism	4(3+1)	MAJOR	
	CS3503	Application of Information and Communication Technologies	3(2+1)	GE/ICT	
SOC3506	Introduction to Sociology	2(2+0)	GE/SS		
SOC3503	Civics and Community Engagement	2(2+0)	GE		
Total			17		
3 rd Semester	MATH3512	Linear Algebra	3(3+0)	ID	
	PHY3509	Waves and Oscillations	3(3+0)	MAJOR	
	MGT3503	Entrepreneurship	2(2+0)	GE	

	PHY3507	Heat and Thermodynamics	3(3+0)	MAJOR	
	ENVS4501	Basics of Environmental Sciences	3(2+1)	GE/ID	
	PHY4504	Laboratory for Thermodynamics and Waves	2(0+2)	MAJOR	
	PHY4505	Modern Physics-I	3(3+0)	MAJOR	
	Total			19	
	4th Semester	PHY4506	Modern Physics-II	3(3+0)	MAJOR
MATH3514		Ordinary Differential Equations	3(3+0)	ID	
PHY4507		Classical Mechanics-I	3(3+0)	MAJOR	
STAT3503		Introduction to Probability & Probability Distribution	3(3+0)	ID	
PHY4508		Laboratory for Geometrical Optics and Spectroscopy	2(0+2)	MAJOR	
PHY3506		Optics	3(3+0)	MAJOR	
Total			17		
5th Semester	PHY3512	Mathematical Methods in Physics-I	3(3+0)	MAJOR	
	PHY5507	Classical Mechanics-II	3(3+0)	MAJOR	
	PHY3516	Electronics	3(3+0)	MAJOR	
	PHY5503	Electromagnetic Theory-I	3(3+0)	MAJOR	
	PHY5504	Laboratory for	2(0+2)	MAJOR	

		Electronics		
	PHY5502	Quantum Mechanics-I	3(3+0)	MAJOR
	Total		17	
6th Semester	PHY5501	Mathematical Methods in Physics-II	3(3+0)	MAJOR
	PHY5508	Laboratory for General Physics	2(0+2)	MAJOR
	PHY6501	Electromagnetic Theory-II	3(3+0)	MAJOR
	PHY5505	Computational Physics	3(3+0)	MAJOR
	PHY6502	Quantum Mechanics-II	3(3+0)	MAJOR
	PHY5509	Field Experience Internship	3(0+3)	INTERNSHIP
Total		17		
7th Semester	PHY6503	Solid State Physics-I	3(3+0)	MAJOR
	PHY6508	Nuclear Physics	3(3,0)	MAJOR
	PHY6512	Laboratory for Nuclear Physics	3(0+3)	MAJOR
	PHY6513	Capstone Project	3(0+3)	PROJECT
	PHY5506	Thermal & Statistical Physics	3(3+0)	MAJOR
	TFSR3501	Fahm-e-Quran (Tajwid, translation and Tafsir)	NC	
Total		15		
8th Semester	PHY6506	Solid State Physics-II	3(3+0)	MAJOR
	PHY6505	Digital & Computer Hardware Electronics	3(3+0)	MAJOR
	PHY3515	Atomic & Molecular Physics	3(3+0)	MAJOR
	PHY6514	Laboratory for Solid State Physics	3(0+3)	MAJOR
	PHY6515	Lasers Physics	3(3+0)	MAJOR

	SERT3501	Seerat-e-Tayyaba	NC	
		Total	15	

New Major Courses

#	Code	Title	CH	Category
1	PHY4504	Laboratory for Thermodynamics and Waves	2(0+2)	MAJOR
2	PHY4505	Modern Physics-I	3(3+0)	MAJOR
3	PHY4506	Modern Physics-II	3(3+0)	MAJOR
4	PHY4507	Classical Mechanics-I	3(3+0)	MAJOR
5	PHY4508	Laboratory for Geometrical Optics and Spectroscopy	2(0+2)	MAJOR
6	PHY5507	Classical Mechanics-II	3(3+0)	MAJOR
7	PHY5508	Laboratory for General Physics	2(0+2)	MAJOR
8	PHY6512	Laboratory for Nuclear Physics	3(0+3)	MAJOR
9	PHY6506	Solid State Physics-II	3(3+0)	MAJOR
1	PHY6514	Laboratory for Solid State Physics	3(0+3)	MAJOR
1	PHY6515	Lasers Physics	3(3+0)	MAJOR

3.4. Fee Tariff for 1st Semester of BS Physics (4-Year)

Item	
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs.600/-
Tuition Fee (Rs. 2420/- per credit hour)	Rs.45980/-
Total	Rs.49890/-

4. BS Physics (BSc Based)

The bridging semester (1st Semester) or comprising (18 credit hours) of foundation courses will be offered.

4.1. Eligibility Criteria

Eligibility Criteria for BS Programs (BSc/AD Based) with Bridging Semester:

1. Students holding BSc degree with 45% marks shall be eligible for admission.
2. Students with an Associate degree (14 years of education) having less than 60 credit hours shall be eligible for admission.
3. Students with a discipline-specific Associate degree who wish to switch to this discipline shall also be eligible for admission.

4.2. Duration of Program

The minimum duration of BS Physics (2.5- year) Program is 2.5 years/ (5 Semesters) and maximum duration to complete BS Physics (2.5 year) program is 4 Years.

4.3. Scheme of Studies for BS Physics (2.5- year)

Revised Scheme of Studies Bridging Semester				
	PHY3505	Electricity & Magnetism	4(3+1)	MAJOR
	PHY4506	Modern Physics-II	3(3+0)	MAJOR
	PHY4507	Classical Mechanics-I	3(3+0)	MAJOR
	PHY3507	Heat and Thermodynamics	3(3+0)	MAJOR
	PHY3509	Waves and Oscillations	3(3+0)	MAJOR
	PHY3506	Optics	3(3+0)	MAJOR
	Total		19	
Semeste	PHY3512	Mathematical Methods in Physics-I	3(3+0)	MAJOR
	PHY5507	Classical Mechanics-II	3(3+0)	MAJOR

	PHY3516	Electronics	3(3+0)	MAJOR
	PHY5503	Electromagnetic Theory-I	3(3+0)	MAJOR
	PHY5504	Laboratory for Electronics	2(0+2)	MAJOR
	PHY5502	Quantum Mechanics-I	3(3+0)	MAJOR
		Total	17	
6 th Semester	PHY5501	Mathematical Methods in Physics-II	3(3+0)	MAJOR
	PHY5508	Laboratory for General Physics	2(0+2)	MAJOR
	PHY6501	Electromagnetic Theory-II	3(3+0)	MAJOR
	PHY5505	Computational Physics	3(3+0)	MAJOR
	PHY6502	Quantum Mechanics-II	3(3+0)	MAJOR
	PHY5509	Field Experience Internship	3(0+3)	INTERNSHIP
		Total	17	
7 th Semester	PHY6503	Solid State Physics-I	3(3+0)	MAJOR
	PHY6508	Nuclear Physics	3(3,0)	MAJOR
	PHY6512	Laboratory for Nuclear Physics	3(0+3)	MAJOR
	PHY6513	Capstone Project	3(0+3)	PROJECT
	PHY5506	Thermal & Statistical Physics	3(3+0)	MAJOR
	TFSR3501	Fahm-e-Quran (Tajwid, translation and Tafsir)	NC	
		Total	15	
8 th Semester	PHY6506	Solid State Physics-II	3(3+0)	MAJOR
	PHY6505	Digital & Computer Hardware Electronics	3(3+0)	MAJOR
	PHY3515	Atomic & Molecular Physics	3(3+0)	MAJOR

	PHY6514	Laboratory for Solid State Physics	3(0+3)	MAJOR
	PHY6515	Lasers Physics	3(3+0)	MAJOR
	SERT3501	Seerat-e-Tayyaba	NC	
		Total	15	

4.4. Fee Tariff for 1st Semester (Bridging Semester)

Item	
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs.600/-
Tuition Fee (Rs. 2420/- per credit hour)	Rs.45980/-
Total	Rs. 49890/-

The fee structure for remaining semesters will be provided in due course of time.

5. BS Physics (AD Based)

5.1. Eligibility Criteria

- Students with Associate degree in the relevant field with at least 60 credit hours shall be eligible for admission.

5.2. Duration of Program

The minimum duration of BS Physics AD Based (2- year) program is two years (4 semesters) and maximum duration to complete BS Physics (2-year) program is four years (8 semesters)

5.3. Scheme of Studies for BS Physics (2- year)

6. TOTAL CREDIT HOURS 64

Seme	PHY3512	Mathematical Methods in Physics-I	3(3+0)	MAJOR
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	PHY5507	Classical Mechanics-II	3(3+0)	MAJOR
	PHY3516	Electronics	3(3+0)	MAJOR
	PHY5503	Electromagnetic Theory-I	3(3+0)	MAJOR
	PHY5504	Laboratory for Electronics	2(0+2)	MAJOR
	PHY5502	Quantum Mechanics-I	3(3+0)	MAJOR
	Total		17	
6 th Semester	PHY5501	Mathematical Methods in Physics-II	3(3+0)	MAJOR
	PHY5508	Laboratory for General Physics	2(0+2)	MAJOR
	PHY6501	Electromagnetic Theory-II	3(3+0)	MAJOR
	PHY5505	Computational Physics	3(3+0)	MAJOR
	PHY6502	Quantum Mechanics-II	3(3+0)	MAJOR
	PHY5509	Field Experience Internship	3(0+3)	INTERNSHIP
	Total		17	
7 th Semester	PHY6503	Solid State Physics-I	3(3+0)	MAJOR
	PHY6508	Nuclear Physics	3(3,0)	MAJOR
	PHY6512	Laboratory for Nuclear Physics	3(0+3)	MAJOR
	PHY6513	Capstone Project	3(0+3)	PROJECT
	PHY5506	Thermal & Statistical Physics	3(3+0)	MAJOR
	TFSR3501	Fahm-e-Quran (Tajwid, translation and Tafsir)	NC	
		Total		15
Semeste	PHY6506	Solid State Physics-II	3(3+0)	MAJOR
	PHY6505	Digital & Computer Hardware Electronics	3(3+0)	MAJOR

	PHY3515	Atomic & Molecular Physics	3(3+0)	MAJOR
	PHY6514	Laboratory for Solid State Physics	3(0+3)	MAJOR
	PHY6515	Lasers Physics	3(3+0)	MAJOR
	SERT3501	Seerat-e-Tayyaba	NC	
	Total		15	

Total Credit Hours = 64

5.4. Fee Tariff for 1st Semester

Item	
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs.600/-
Tuition Fee (Rs. 2420/- per credit hour)	Rs.41140/-
Total	Rs. 45050/-

The fee structure for remaining semesters will be provided in due course of time.

6.1 Medium of Instruction

The Medium of Instructions for BS Physics will be English.

6.2 Study Material

The Department will provide course books

6.3 Mode of Teaching

- University will provide opportunities face to face teaching to the students.

- b) The schedule of classes and dates of submission of assignments/tests/quizzes/presentations will be announced by the department.

6.4 Assessment and Evaluation

See page vi

Note: If a student fails to pass in any of assessment component of a particular course, he / she will have to re-enroll in that course

BS Physics with DATA Science Minor

Degree Title: BS Physics
 Transcript: BS Physics (Minor in DATA Science)
 Duration: 4 Years (8 Semester) 148 Credit Hours
 Eligibility: Inter (Pre-medical/Pre-Engineering/Computer) A-Level/DAE with Physics as a course.
 Admission: Selection on Merit Bases Based on Criteria laid down by the Department and University. Departmental Admission Committee to conduct an admission test/interview.

BS Physics with DATA Science (Minor)				
No.	Code	Title	Cr.H.	Category
1 st Semester	ENGL3505	Functional English	3(3+0)	GE/ENG
	PKST3502	Ideology and Constitution of Pakistan	2(2+0)	GE/PKST
	MATH3502	Calculus-I	3(3+0)	GE/QR-I
	URD3503	Pakistani Adab-I	2(2+0)	GE/A&H
	PHY3501	Mechanics	4(3+1)	MAJOR
	ITHC3501/ADH3501	Islamic Studies or Ethics (for non-Muslim students)	2(2+0)	GE/IST

		only)		
	CS6505	Computer Programming: C&C++	3(3+0)	ID
	Total		19	
2 nd Semester	MATH3509	Calculus-II	3(3+0)	GE/QR-II
	ENGL3504	Expository Writing	3(3+0)	GE/ENG
	PHY3505	Electricity & Magnetism	4(3+1)	MAJOR
	CS3503	Application of Information and Communication Technologies	3(2+1)	GE/ICT
	SOC3506	Introduction to Sociology	2(2+0)	GE/SS
	SOC3503	Civics and Community Engagement	2(2+0)	GE
	Total		17	
3 rd Semester	MATH3512	Linear Algebra	3(3+0)	ID
	PHY3509	Waves and Oscillations	3(3+0)	MAJOR
	MGT3503	Entrepreneurship	2(2+0)	GE
	PHY3507	Heat and Thermodynamics	3(3+0)	MAJOR
	ENVS4501	Basics of Environmental Sciences	3(2+1)	GE/ID
	PHY4504	Laboratory for Thermodynamics and Waves	2(0+2)	MAJOR
	PHY4505	Modern Physics-I	3(3+0)	MAJOR

	Total		19	
4 th Semester	PHY4506	Modern Physics-II	3(3+0)	MAJOR
	MATH3514	Ordinary Differential Equations	3(3+0)	ID
	PHY4507	Classical Mechanics-I	3(3+0)	MAJOR
	STAT3503	Introduction to Probability & Probability Distribution	3(3+0)	ID
	PHY4508	Laboratory for Geometrical Optics and Spectroscopy	2(0+2)	MAJOR
	PHY3506	Optics	3(3+0)	MAJOR
	Total		17	
5 th Semester	PHY3512	Mathematical Methods in Physics-I	3(3+0)	MAJOR
	PHY5507	Classical Mechanics-II	3(3+0)	MAJOR
	PHY3516	Electronics	3(3+0)	MAJOR
	PHY5503	Electromagnetic Theory-I	3(3+0)	MAJOR
	PHY5504	Laboratory for Electronics	2(0+2)	MAJOR
	PHY5502	Quantum Mechanics-I	3(3+0)	MAJOR
	New	Introduction to DATA Science	3(3+0)	Minor
	Total	20		
Semester	PHY5501	Mathematical Methods in Physics-II	3(3+0)	MAJOR
	PHY5508	Laboratory for General	2(0+2)	MAJOR

		Physics		
6 th Semester	PHY6501	Electromagnetic Theory-II	3(3+0)	MAJOR
	PHY5505	Computational Physics	3(3+0)	MAJOR
	PHY6502	Quantum Mechanics-II	3(3+0)	MAJOR
	PHY5509	Field Experience Internship	3(0+3)	INTERNSHIP
	New	Machine Learning	3(2+1)	Minor
		Total	20	
	7 th Semester	PHY6503	Solid State Physics-I	3(3+0)
PHY6508		Nuclear Physics	3(3,0)	MAJOR
PHY6512		Laboratory for Nuclear Physics	3(0+3)	MAJOR
PHY6513		Capstone Project	3(0+3)	PROJECT
PHY5506		Thermal & Statistical Physics	3(3+0)	MAJOR
New		Artificial Neural Networks and Deep Learning	3(2+1)	Minor
TFSR3501		Fahm-e-Quran (Tajwid, translation and Tafsir)	NC	
	Total	18		
8 th Semester	PHY6506	Solid State Physics-II	3(3+0)	MAJOR
	PHY6505	Digital & Computer Hardware Electronics	3(3+0)	MAJOR
	PHY3515	Atomic & Molecular Physics	3(3+0)	MAJOR
	PHY6514	Laboratory for Solid State Physics	3(0+3)	MAJOR
	PHY6515	Lasers Physics	3(3+0)	MAJOR
	New	Data Visualization	3(2+1)	Minor
	SERT3501	Seerat-e-Tayyaba	NC	
	Total	18		

Fee Tariff for 1st Semester of BS Physics (4-Year) DATA Science

Item	
Registration Fee (Once at time of admission)	Rs.600/-
Admission Fee (Once at time of admission)	Rs.1210/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.600/-
Tuition Fee (Rs. 2420/- per credit hour)	Rs.45980/-
Total	Rs.49890/-

7 Contact Details

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DEPARTMENT OF STATISTICS

The Department of Statistics was established in 1988 in the faculty of Sciences, Allama Iqbal Open University. Since then, the faculty and students have shared a common goal of maturing the Department with sheer hard work and constant struggle. Statistical sciences have a significant impact on our lives and are a key to discoveries and innovation. Over time, with concerted efforts, the Department has grown to its full potential and is vigorously involved in participating in global efforts to drive a new era of growth, development, and productivity. Since, our world is becoming more quantitative and data focused, job opportunities in statistics are plentiful and projected to increase worldwide. Therefore, the alumni of the department of statistics have been working in various government departments and private sector.

The vision of the Department is to impart quality education that focuses on collaborative learning through innovative teaching and research methodologies. It aims to create an environment that enables students to effectively engage in making lasting contributions in diverse fields according to rapidly changing demands of not only the home country but the entire globe. The Department is determined to further develop a state-of-the-art model of learning and research, which will benefit the masses across the board.

The following degree programs are being offered in the Department of Statistics. All these programs are approved by the Higher Education Commission, Islamabad.

- PhD Statistics

- MPhil Statistics
- BS (4- years, 2.5 -year & 2 -year) Statistics

All the courses and contents of these programs are designed to meet the challenging statistical needs in life sciences, information technology, social sciences, and other allied disciplines. The course outlines of all level courses have been designed and updated recently after consulting the syllabi of national and international universities. It helps to strengthen the statistical concepts and logical thinking among our students.

Presently, these degree programs are offered at the main campus only. However, soon the Department also intends to offer these degree programs at the main regional headquarters.

BS STATISTICS PROGRAM

1. Introduction

With the passage of time in the new era of globalization, significant changes have been made in almost all walks of life to keep in pace with the growing world. Among many other fields, improvement in the existing education system has become the topmost priority of many nations across the globe. Therefore, it is the need for time to modify our current education system to meet international standards. Having a vision of brighter future with compatible educated youth, the Department of Statistics is launching BS Statistics program from spring 2017. The BS Statistics would be sixteen years education equivalent to MSc Statistics and fulfilling the international standards of graduate degree.

2. Objectives

- To enhance and up gradation of qualification of those potential candidates who have/do not have sufficient resources to continue their studies after intermediate.
- To enable the students to get a better insight regarding in-depth knowledge of Statistics.
- To produce quality teachers/ researchers of Statistics at all levels.
- To prepare well trained and skilled graduates to cater the future needs in the field of Statistics.
- To produce young and energetic minds in the field of Statistics to promote innovative research and critical thinking.

3. BS Statistics (4-Year Program)

3.1 Eligibility Criteria

Candidate having HSSC or equivalent exams approved/verified by Inter Board Committee of Chairmen (IBCC).

3.2 Duration of the Programme

For the award of BS Statistics (4 years) degree, the student will have to qualify the 126 credit hours consisting 44 courses withing a minimum period of eight semesters (4 years) and maximum period of BS Statistics (4 years)

Scheme of Studies

The full programme of BS Statistics comprises eight semesters. The all courses are compulsory to qualify for the award of BS Statistics degree. The semester wise course offering is as under.

Scheme of studies BS Statistics (4 years)

Course Title	Code		CH
Semester I			
1. Functional English	ENGL3505	Gen. edu.	3(3+0)

2. Ideology and Constitution of Pakistan	PKST3502	Gen. Edu.	2(2+0)
3. Islamic Studies/ Ethics	ITH3501/ HAD3501	Gen. Edu.	2(2+0)
4. Calculus-I	MATH3502	Interdict	3(3+0)
5. Pakistan-Adab-I	URD3501	Gen.edu.	2(2+0)
6. Introductory Statistics	STAT3501	Major	3(3+0) 15
Semester II			
1. Expository Writing	ENGL3504	Gen. Edu.	3(3+0)
2. Civic and community Engagement	SOC3503	Gen. Edu.	2(2+0)
3. Calculus-II			
4. Introduction to Regression and Time series Analysis	MATH3509 STAT 3508	Interdict Major	3(3+0) 3(3+0)
5. Application of Information Communication & Technologies	CS3503 SOC3506	Gen. Edu. Gen. Edu.	3(2+1) 2(2+0) 16
6. Introduction to Sociology			
Semester III			
1. Quantitative Reasoning	MATH3508 STAT4504	Gen.edu. Major	3(3+0) 3(2+1)
2. Exploratory Data Analysis	STAT4503	Major	3(3+0)
3. Basic Design of Experiments	STAT3503	Major	3(3+0)
4. Introduction to Probability & Probability	ENVS4501 MGT3503	Natural Science Gen. Edu.	3(2+1) 2(2+0)

Distributions. 5. Basics of Environmental Science 6. Entrepreneurship			17
Semester IV 1. Basic Statistical Inference 2. Official Statistics 3. Quantitative Reasoning-II 4. Data Analytic and Machine Learning 5. Sampling and Sampling Distributions 6. Vital Statistics	STAT4501 STAT4502 STAT4505 MATH4505 STAT4506 STAT4507 STAT4508	Major Major Gen. Edu. Major Major Major	3(3+0) 3(3+0) 3(3+0) 3(3+0) 3(3+0) 3(3+0) 18
Course Title	Code	CH	
Semester V 1. Sampling techniques I 2. Design and Analysis of Experiments-I 3. Probability & Probability Distributions-I 4. Mathematical Methods Fahm-e-Quran (Tajwid, translation and Tafsir) 5. 6. Computer and Scientific Application	STAT5502 STAT5503 STAT5504 MATH4504 TFSR3501 MATH3510	3(3+0) 3(3+0) 3(3+0) 3(3+0) NC 3(2+1) 15	

Semester VI 1. Data analysis and Statistical Packages 2. Probability & Probability Distributions-II 3. Regression Analysis 4. Sampling Techniques-II 5. Seerat -E-Tayyab 6. Design and Analysis of Experiments-II	STAT5510 STAT5506 STAT5507 STAT5508 SERT3501 STAT5509	3(0+3) 3(3+0) 3(3+0) 3(3+0) NC 3(3+0) 15	
Semester VII 1. Statistical Inference- Estimation 2. Econometrics 3. Elective – I 4. Elective-II Field Experience Internship	STAT6501 STAT6502 STAT6514	3(3+0) 3(3+0) 3(3+0) 3(3+0) 3(0+3) 15	
Semester VIII 1. Statistical Inference- Testing of Hypothesis 2. Elective-III 3. Elective-IV 4. Capstone Project 5. Operation research	STAT6505 STAT6515 STAT6507	3(3+0) 3(3+0) 3(3+0) 3(0+3) 3(3+0) 15	

Scheme of studies BS Statistics, (BA/BSc Based)

Eligibility Criteria for BS Programs

(BSc/AD Based with less than 60 Credit Hours)

With bridging semester:

1. Student: Holding a BSc degree with at least 45% marks shall be eligible for admission.
2. Student with an Associate Degree having less than 60 Credit Hours shall be eligible for admission.
3. Student with a discipline-Specific Associate Degree with 50% marks who wish to switch to another discipline shall also be eligible for admission.

**PROPOSED SCHEME OF STUDIES BS B.SC BASED
STATISTICS
TOTAL CREDIT HOURS 78**

Bridging Semester		
1. Introductory Statistics	STAT3501 STAT3503	3(3+0) 3(3+0)
2. Introduction to Probability and Probability Distributions	STAT4503 STAT3508 MATH3502 STAT 4507	3(3+0) 3(3+0) 3(3+0) 3(3+0)
3. Basic Design of Experiments		18
4. Introduction to Regression and Time Series Analysis		
5. Calculus-I Sampling and Sampling Distributions		

Course Title	Code	CH
Semester V		
6. Sampling techniques I	STAT5502 STAT5503	3(3+0) 3(3+0)
7. Design and Analysis of Experiments-I	STAT5504 MATH4504 TFSR3501	3(3+0) 3(3+0) NC
8. Probability & Probability Distributions-I	MATH3510	3(2+1) 15
9. Mathematical Methods Fahm-e-Quran (Tajwid, translation and Tafsir)		
10. Computer and Scientific Application		
Semester VI		
7. Data analysis and Statistical Packages	STAT5510 STAT5506 STAT5507	3(0+3) 3(3+0) 3(3+0)
8. Probability & Probability Distributions-II	STAT5508 SERT3501 STAT5509	3(3+0) NC 3(3+0)
9. Regression Analysis		15
10. Sampling Techniques-II		
11. Seerat -E- Tayyab		
12. Design and Analysis of		

Experiments-II		
Semester VII		
5. Statistical Inference- Estimation	STAT6501 STAT6502	3(3+0) 3(3+0) 3(3+0)
6. Econometrics		3(3+0)
7. Elective – I	STAT6514	3(0+3)
8. Elective-II		15
Field Experience Internship		
Semester VIII		
6. Statistical Inference- Testing of Hypothesis	STAT6505	3(3+0) 3(3+0) 3(3+0)
7. Elective-III	STAT6515	3(0+3)
8. Elective-IV	STAT6507	3(3+0)
9. Capstone Project		15
10. Operation research		

Note: After completing bridging semester, students will continue their studies with BS Statics 5th semesters.

3.4 Fee Tariff for 1st semester

Item	Fee
Registration Fee:	Rs.600/-
Admission Fee:	Rs.1210/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee (per semester):	Rs.600/-
Course Code	Fee
5468	Rs.7260/-
4432	Rs.7260/-

4434	Rs.7260/-
5465	Rs.4840/-
5451	Rs.7260/-
9424	Rs.7260/-
Lab fee (per semester)	Rs.935/-
Total Semester Fee	Rs.45985/-

The fee structure for remaining semesters will be provided in due course of time.

Scheme of Studies BS Statistics (2 Years)/ AD Based

Eligibility Criteria: Associate Degree in the relevant field with at least 60 Credit Hours.

Course Title	Code	CH
Semester V		
11. Sampling techniques I	STAT5502 STAT5503	3(3+0) 3(3+0)
12. Design and Analysis of Experiments-I	STAT5504 MATH4504 TFSR3501	3(3+0) 3(3+0) NC
13. Probability & Probability Distributions-I	MATH3510	3(2+1) 15
Mathematical Methods Fahm-e-Quran (Tajwid, translation and Tafsir)		
14. Computer and Scientific Application		
Semester VI		
13. Data analysis and Statistical	STAT5510 STAT5506	3(0+3) 3(3+0)

Packages	STAT5507	3(3+0)
14. Probability & Probability Distributions-II	STAT5508 SERT3501 STAT5509	3(3+0) NC 3(3+0)
15. Regression Analysis		15
16. Sampling Techniques-II		
17. Seerat -E-Tayyab		
18. Design and Analysis of Experiments-II		
Semester VII		
9. Statistical Inference- Estimation	STAT6501 STAT6502	3(3+0) 3(3+0) 3(3+0)
10. Econometrics		3(3+0)
11. Elective – I	STAT6514	3(0+3)
12. Elective-II Field Experience Internship		15
Semester VIII		
11. Statistical Inference- Testing of Hypothesis	STAT6505	3(3+0) 3(3+0) 3(3+0)
12. Elective-III	STAT6515	3(0+3)
13. Elective-IV	STAT6507	3(3+0)
14. Capstone Project		15
15. Operation research		

6. Mode of Study

6.1 Medium of Instruction

For each course, there would be 48 hours face to face teaching support to the students. Three-hour class/week for (3+0) credit hour course for a semester of sixteen weeks. The distribution of the lectures will be provided to the students in classes/workshop by consultation with the teachers/resource persons. The classes will be supplemented by computers where required. Over all 70% attendance would be compulsory to appear in sessional tests and final examinations.

6.2 Study Material

Books (soft copies) will be provided to the students, along with the list of recommended books for further reading. Two assignments for each course will be given.

Mode of Teaching: For each course, 45 hours face to face teaching at the main campus Islamabad will be required. In this regard, classes will be arranged by the Department at AIOU main campus Islamabad. The schedule of the lectures will be distributed to students at the start of classes during each semester at AIOU, Islamabad. A minimum of 70% attendance is necessary in all subjects as per AIOU rules.

6.3.1 Assessment and Evaluation

a. Continuous Assessment

Classes/Workshops Schedule:

The classes/workshops will be arranged at Main Campus, AIOU, Islamabad only. However, the schedule is prepared according to the availability of qualified teaching faculty and convenience of the students.

Assessment:

See page vi

7. Guidelines for online Application

- Visit AIOU Website www.aiou.edu.pk
- Click on OAS (Online Admission. System) for Fresh Admission.
- Click 'Register' & fill details.
- Upon successful registration please click on login.
- Fill login details and login to the portal
- After login click on Step-1 and complete your profile.
Note: All tabs should be filled in before applying for admissions.
- After completion of Step-1, click on Step-2 then click on "Download Challan" against program (s) you wish to apply.
- Pay the *admission form fee* as per AIOU prescribed criteria through selected bank branches or online payment methods.
- After admission fee confirmation, you will be called on through SMS to visit the department for the verification of your credentials.
- After the verification, you will be informed whether you are eligible for the admission in BS Program or not.

Note: Please use your own mobile no. in login so that you receive the SMS from university and updates throughout 4 years.

8. Contact details

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DEPARTMENT OF NUTRITIONAL SCIENCES & ENVIRONMENTAL DESIGN

Pakistan is a developing country, and it is the need of the hour to improve standard of education in all disciplines especially in science and technology to better cope with the challenges of 21st century. The Department was first established in 1981. During last few decades the Department has developed a range of professional programs in Health and Nutrition, Environmental Design and Home Economics. Multipurpose teaching/ research labs for Environmental Design and Food and Nutrition programs have been set up to provide a comprehensive environment for imparting practical training and research at the main campus.

Health care in the whole world has changed substantially in the new millennium. New disciplines have emerged, and role of traditional health disciplines has broadened to keep pace with the changing emphasis from curative to preventive health care. The focus from curing nutritional deficiencies has shifted to searching the role of diet in the cause of chronic diseases and examining the importance of nutrients in maintaining good health. The objectives of department includes:

Aims and Objectives

1. To upgrade and update the skills & knowledge of professionals in various fields of applied sciences, engineering & architecture
2. To prepare learners for the career related disciplines considering the professional interests of individuals in the areas of Environmental Design, Engineering & Architecture, Health, Food Science, Nutrition, Dietetics, and Home Economics
3. To prepare the individuals/professionals for the development and up gradation of community & sustainable environment
4. To enable the individuals to integrate and apply knowledge and skills of Basic Sciences, Home Economics & Applied Sciences for their professional development.

The Department has produced scientific/value added and professional programs/courses in the areas of Environmental Design, Health, Food & Nutrition and Home Economics. The courses are being offered at undergraduate, postgraduate, MS and PhD level programs.

BS HUMAN NUTRITION AND DIETETICS

The Bachelor of Science (BS) program in Human Nutrition and Dietetics is designed to provide students with a comprehensive understanding of the science of nutrition and the role of diet in health and disease prevention. Here are some salient features of this program:

- The program offers a blend of courses in nutrition, food and health sciences and general education.
- Laboratory sessions and practical classes to develop skills in diet planning, nutritional assessment and food analysis.
- Emphasis on research methodologies and evidence-based practices in nutrition.
- Curriculum aligned with standards of relevant accrediting bodies.
- Internship opportunities in hospitals, clinics, community health centres, and food industries to gain real-world experience
- Final year capstone project to demonstrate acquired knowledge and skills

OBJECTIVES

The program objectives are:

- To equip students with a deep understanding of nutrition, food science, and dietetics
- To develop their abilities to assess nutritional needs and create effective dietary plans
- To prepare students for clinical practice in dietetics, including medical nutrition therapy,

and for planning and evaluating public health nutrition programs

- To foster research skills and the application of evidence-based practices in nutrition and dietetics

Eligibility Criteria

F.Sc (Pre-medical) OR Equivalent “A” Level qualification with Biology as major subject. Foreign certificate holders will need to produce equivalence certificate from IBCC to seek admission in 4 years BS Human Nutrition and Dietetics.

Duration of the Programme

In order to be eligible for the award of BS in Human Nutrition and Dietetics, the student will have to earn a total of 136 credit hours within a minimum period of 4 years (8 semesters) failing which, a student can be given an extension of upto 2 years in maximum after completion of initial period.

Scheme of studies (BS Human Nutrition and Dietetics)

Sr. No.	Title of Course	Course Code	Course Contents	Credit Hours
1st Semester				
1	Fundamentals of Human Nutrition	EDHN 3505	APPROVED	3(3-0)Major
2	Functional English	ENG 3505	NEW	3(3-0)General

3	Islamic studies/ Ethics	ITHC3 501/H ADH3 501	NEW	2(2-0) General
4	Ideology and constitution of Pakistan	PKST 35	NEW	2(2-0) Ge
5	Quantitative reasoning	MATH 3508	NEW	3(3-0) General
6	Pakistan adab-1	URD3 505	NEW	2(2-0) General
7	Biostatistics	STAT3 506	APPROVED	3(3-0) Interdisc iplinary
Total credits				18
2nd semester		Course Code	Course Contents	
1	Human Anatomy	EDHN 3503	APPROVED	3(2-1) Major
2	Expository writing	ENGL 3504	NEW	3(3-0) General
3	Quantitative reasoning-II	MATH 4505	NEW	3(3-0) General
4	Application of Information and Communication Technologies	CS350 3	NEW	3(2-1) General
5	Civic and community	SOC35 03	NEW	2(2-0) General

	engagement			
6	Introduction to Sociology	SOC35 06	NEW	2(2-0) General
Total credits				16
3rd Semester		Course Code	Course Contents	
1	Macronutrie nts in Human Nutrition	EDHN 4501	APPROVED	3(3-0) Major
2	Dietetics-I	EDHN 4502	APPROVED	3(2-1) Major
3	Entrepreneur ship	MGT 3503	NEW	2(2-0) General
4	Essentials of Food Science & Technology	EDHN 4503	APPROVED	3(2-1) Major
5	Basics of Environment al Sciences	ENVS 4501	APPROVED	3(2-1) Major
6	Food Toxins & Allergens	EDHN 4504	APPROVED	3(3-0) Major
Total credits				17
4th semester		Course Code	Course Contents	
1	Food and Dairy Microbiolog y	BIO55 05	APPROVED	3(2-1) Interdisc iplinary
2	Dietetics-II	EDHN	APPROVED	3(2-1)

		4506		Major
3	Nutrition Through the Life Cycle	EDHN 4507	APPROVED	3(3-0) Major
4	Assessment of Nutritional Status	EDHN 4508	APPROVED	3(2-1) Major
5	Food Analysis	EDHN 4509	APPROVED	3(2-1) Major
6	Micronutrients in Human Nutrition	EDHN 4510	APPROVED	3(3-0) Major
Total credits				18
5th semester		Course Code	Course Contents	
1	Physiology-I	EDHN 5501	APPROVED	3(2-1) Major
2	Nutrition and Psychology	EDHN 5502	APPROVED	3(3-0) Major
3	Nutritional Education and Awareness	EDHN 5503	APPROVED	3(2-1) Major
4	Dietetics-III	EDHN 5504	APPROVED	3(2-1) Major
5	Public Health Nutrition	EDHN 5505	APPROVED	3(2-1) Major
6	Food and Drug Laws	EDHN 5506	APPROVED	2(2-0) Major
7	Fahm-e-	TFSR	NEW	Non-

	Quran (tajwid, translation and tafseer)	3501		credit course
Total credits				17
6th semester		Course Code	Course Contents	
1	Physiology-II	EDHN 5507	APPROVED	3(2-1) Major
2	Functional Foods and Nutraceuticals	EDHN 5508	APPROVED	3(3-0) Major
3	Drug-Nutrient Interactions	EDHN 5509	APPROVED	2(2-0) Major
4	Sports Nutrition	EDHN 5510	APPROVED	3(2-1) Major
5	Infant and Young Child Feeding	EDHN 5511	APPROVED	3(2-1) Major
6	Meal Planning and Management	EDHN 5512	APPROVED	3(2-1) Major
7	Seerat-e-Tayyaba	SERT 3501	NEW	Non-credit course
Total credits				17
7th semester		Course Code	Course Contents	
1	Nutritional Biochemistry	BIO5515	APPROVED	3(2-1) Interdisc

				iplinary
2	Global Food Issues	6501	APPROVED	3(3-0) Major
3	General Pathology	TBA 6502	APPROVED	3(3-0) Major
4	Nutritional Practices in Clinical Care	TBA 6503	APPROVED	3(2-1) Major
5	Epidemiology	BIO65 06	APPROVED	3(2-1) Interdisc iplinary
6	Internship	EDHN6 504		3(0-3)
Total credits				18
8th semester		Course Code	Course Contents	
1	Research Methods	EDHN 6505	APPROVED	3(3-0) Major
2	Nutrition Through Social Protection	EDHN 6506	APPROVED	3(3-0) Major
3	Nutrition in Emergencies	EDHN 6507	APPROVED	3(3-0) Major
4	Nutrition policies and programs	EDHN 6508	APPROVED	3(3-0) Major
5	Capstone project	EDHN 6509		3(0-3)

Total credit hours: 136

Fee Tariff for First semester

Items	Rates
Registration fee (once at time of admission)	Rs. 600/-
Admission fee (once at time of admission)	Rs. 1210/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology fee	Rs. 600/-
Per credit hour fee: Rs 2420	Rs. 43560/-
Lab charges	Rs. 3630/-
Total	Rs. 51100/-

The fee structure for remaining semesters will be provided in due course of time.

Mode of Study:

i. Medium of Instruction

The Medium of Instructions for BS Human Nutrition and Dietetics will be English.

ii. Study Material

Lecture handouts will be provided by the department. The students are also advised to consult other reference books recommended by the department.

iii. Mode of Teaching

- University will provide face to face teaching to the students.
- The schedule of classes and dates of submission of assignments will be announced by the department.

iv. **Assessment and Evaluation**

See page vi

For each course the student progress will be assessed on the basis of the followings:

For theory courses:

Sr. No	Components	Total marks	Weightage	Passing marks
1	Assignment	10	20%	50% (In aggregate)
2	Assignment 2	10		
3	Mid term	30	30%	
4	Attendance	100	Nil	70%
5	Final exam	100	50%	50%

For theory-practical courses:

Sr. No	Components	Total marks	Weightage	Passing marks
1	Assignment	10	20%	50% (In aggregate)
2	Assignment 2	10		
3	Mid term	15	30%	
4	Practical	15		
5	Attendance	100	Nil	70%
6	Final exam	100	50%	50%

DEPARTMENT OF COMPUTER SCIENCE

The Department of Computer Science (DCS) was established in the year 2000. The Department has received recognition nation-wide due to its quality education. The department had developed curricula of the academic programs at various levels to meet the national and international standards as defined by Higher Education Commission. The curricula include Ph. D (computer Science), MS (Computer Science), BS (Computer Science) and Postgraduate Diploma (PGD) in Computer Science. The department is equipped with computing facilities and services including a digital class room and multimedia courseware development lab. The department has its own library in addition to central library of the university. The Department of Computer Science practices the multi-method teaching methodology i.e. face-to-face regular classes for BS (Computer Science) and MS (Computer Science). The online methodology is practiced for PGD (Computer Science) and Foreign Language (French). The facilities of Video/Teleconferencing are also in use for lectures/consultations in research-oriented degree of MS/PhD (Computer Science). In addition, the department also has a flavor of distance teaching in selected courses of BS (Computer Science) program like English, Pakistan Studies, and Islamic Studies etc. Besides graduate and undergraduate teaching, the department is actively

involved in research and development. For this purpose, Multimedia Centre and Open Learning Institute of Virtual Education (OLIVE) have been established under the umbrella of the department. The Multimedia center is equipped with technology related to Audio/Video production. It has successfully developed multimedia courseware for more than 20 courses, whereas OLIVE provided a framework for electronic delivery of these courses in online mode. In addition to research activities in the area of software engineering communication, networking, and multimedia, the department focuses on the eLearning research in instruction design, communication, course management, e-assessment, mobile learning and web technologies integration. The University has also developed linkages with San Jose' State University (SJSU) USA and Kent State University, USA. KSU is located in the heart of Silicon Valley and Kent State has strong education college with Technology Research Centers.

The principal aim of the Department of Computer Science is to produce graduates with a professional education and to undertake quality research in Computer Science and Related

Information Technology areas. The specific objectives are to:

- i. Maintain an excellent reputation and professional accreditation for its taught degree programs.

- ii. Disseminate an appreciation of the current state and future directions of technological advances in the areas of Computer Science, Information Technology and e-learning.
- iii. Equip students with computer science knowledge and skills to cope with the social, economic, scientific, and technological challenges of the world outside.
- iv. Develop platform and systems for e-learning/mechanism for electronic delivery of courses to increase outreach to rural and remote areas.
- v. Conduct research in areas of e-learning, multimedia instructional design, web-based education, mobile learning and related areas in software engineering, information technology, and computer science.
- vi. Assist other departments and individuals to implement modern ICT in educational delivery.
- vii. Provide a leadership support in ICT based education in Pakistan.

BS COMPUTER SCIENCE (4-YEAR PROGRAM)

1. Introduction

The BS (CS) program is offered by the Department of Computer Science, AIOU. It is a four- years degree program, covering the recent trends in hardware, software and communication technologies. The program provides an understanding of the field through concepts, theory and techniques. The curriculum of the program has been

developed and regularly updated to meet the national, international, social and economic needs. The curriculum revision is normally based on need of fast changing disciplines, emerging technologies and international standards. The structure and other details of the program are confined to HEC with focus on ACM and IEEE-CS recent development.

2. Objectives

The objectives of the program are to:

- i. Develop professionals in the field of computer science.
- ii. Provide high quality education at low cost.
- iii. Provide knowledge to individuals seeking computer skills to increase their job opportunities in their current careers or to pursue new careers.
- iv. Learn in-depth knowledge of computer languages, software engineering, computer architecture, large-scale system software and multimedia in the design.
- v. Provide sufficient conceptual and skill based know how so that successful graduates could initiate IT career in industry and academia.

3. Eligibility

Minimum 50% marks in Intermediate/12 years schooling/A- Level (HSSC) or Equivalent with Mathematics are required for admission in BS(CS). Equivalency certificate by IBCC will be required in case

of education from some other country or system. The students who have not studied Mathematics at intermediate level have to pass deficiency courses of Mathematics in first two semesters.

The departmental admission committee shall determine the eligibility accordingly.

4. Duration of Program

- i. The BS (CS) is 133 credit hours' program and may be completed in minimum four years (eight semesters).
- ii. Two semesters are offered in a year as Spring and Autumn.
- iii. Duration of each semester is 16 weeks.
- iv. The maximum time limit to complete the BS (CS) Program is Six Years from the date of first registration of the student in this program.

5. Scheme of Study

Semester-1

S#	Code	Title	Cre. Hrs.
1	CS 3504	Computer Programming	4(3+1)
2	CS3503	Applications of Information & Communication Technologies	3(2+1)
3	MATH 3516	Discrete Mathematics	3(3+0)
4	MATH 3502	Calculus-I	3(3+0)
5	Engl 3505	Functional English	3(3+0)
6	N/C MATH	Pre-Calculus 1	Deficiency

	3517		
Total 16 (14+2)			

Semester-2

S#	Code	Title	Cre. Hrs.
1	CS 3506	Object Oriented Programming	4(3+1)
2	CS 3507	Database Systems	4(3+1)
3	CS 3508	Digital Logic Design	3(2+1)
4	MATH 3509	Calculus-II	3(3+0)
5	MATH 3512	Linear Algebra	3(3+0)
6	MATH 3518	Pre-Calculus 2	Deficiency
Total 17 (14+3)			

Semester-3

S#	Code	Title	Cre. Hrs.
1	CS 4521	Data Structures	4(3+1)
2	CS 4522	Information Security	3(2+1)
3	CS 4523	Artificial Intelligence	3(2+1)
4	CS 4524	Computer Networks	3(2+1)
5	CS 4525	Software Engineering	3(3+0)
6	STAT 4509	Probability & Statistics	3(3+0)
Total 19 (15+4)			

Semester-4

S#	Code	Title	Cre. Hrs.
1	CS 4526	Computer Organization &	3(2+1)

		Assembly Language	
2	CS 4527	Theory of Automata	3 (3-0)
3	CS 4528	Advance Database Management Systems	3 (2-1)
4	CS 4509	Applied Physics	3(2+1)
5	ENGL3504	Expository Writing	3(3+0)
6	ITHC3501/ HADH3501	Islamic Studies / Ethics	2(2+0)
Total 17 (14+3)			

Semester-5

S#	Code	Title	Cre. Hrs.
1	CS 5502	Operating Systems	3(2+1)
2	CS 5503	HCI & Computer Graphics	3 (2+1)
3	CS 5504	Computer Architecture	3 (2+1)
4	-	Domain Elective 1	3(2+1)
5	-	Domain Elective 2	3(2+1)
6	MGT3504	Introduction to Management	2(2+0)
7	TFSR 3501	Fahm-E-Quran (Tajwid, Translation and Tafsir)	Non-Cre.
Total 17 (12+5)			

Semester-6

S#	Code	Title	Cre. Hrs.
1	CS 5505	Compiler Construction	3 (2+1)
2	CS 5506	Parallel and Distributed Computing	3 (2+1)
3	-	Domain Elective 3	3 (2+1)
4	-	Domain Elective 4	3 (2+1)

5	-	Domain Elective 5	3 (2+1)
6	-	Domain Elective 6	3 (2+1)
7	SERT3501	Seerat-e-Tayyaba	Non-Cre.
Total 18 (12+6)			

Semester-7

S#	Code	Title	Cre. Hrs.
1	CS 6501	Final Year Project – I	2(0+2)
2	CS 6502	Analysis and Design of Algorithm	3(3+0)
3	-	Domain Elective 7	3(2+1)
4	CS 6503	IT Marketing Concepts	3(3+0)
5	ENGL 3503	Technical and Business Writing	3(3+0)
6	MGT3503	Entrepreneurship	2(2+0)
7	CS 6507	Internship	3(0-3)
Total 19 (13+6)			

Semester-8

S#	Code	Title	Cre. Hrs.
1	CS 6504	Final Year Project – II	4(0+4)
2	PKST3502	Ideology and Constitution of Pakistan	2(2+0)
3	CS 6506	Professional Practices	2(2+0)
4	SOC3503	Civics and Community Engagement	2(2+0)
Total 10 (6+4)			

The student can select seven courses from the list of elective courses.

List of electives offered in the BS(CS) Program:

Computer Science Elective List (Domain Electives):

Domain Elective (2.2)			
S#	Code	Course Title (Per HEC 2023)	Cr. Hrs.
1.	CS 5507	Web Technologies	3 (2-1)
2.	CS 5508	Mobile Application Development 1	3 (2-1)
3.	CS 5509	Visual Programming	3 (2-1)
4.	CS 5510	Numerical Computing	3 (2-1)
5.	CS 5511	Web Engineering	3 (2-1)
6.	CS 5512	Cyber Security	3 (2-1)
7.	CS 5513	Software Testing & Quality Assurance	3 (2-1)
8.	CS 5514	Mobile Application Development 2	3 (2-1)
9.	CS 5515	Cloud Computing	3 (2-1)
10.	CS 5516	Computer Graphics	3 (2-1)
11.	CS 5517	Object Oriented Analysis & Design	3 (2-1)
Total Credit Hours			21 (14-7)

The Department of Computer Science reserves the right to offer or may not offer listed particular course depending upon the available faculty/laboratory resources and viable student's enrollment.

6. Fee Tariff

Item	-
Registration Fee: (At the time of 01 st admission)	Rs. 600/-
Admission Fee: (At the time of 01 st admission)	Rs. 1210/-
Degree Fee (Once at time of admission)	Rs. 1500/-

Technology Fee (Each semester)	Rs. 600/-
Lab Fee	Rs. 6050/-
Per Credit Hour Fee 2420	Rs. 38720
Total Fee for First Semester	Rs. 48680/-

7. Mode of Study

7.1 Medium of Instruction

The medium of instruction for BS (CS) Program is English.

7.2 Study Material

The class teacher will provide the study material. However, the students are advised to consult books from the list of recommended books.

7.3 Mode of Teaching

- i. The BS (CS) program is a non-merit-based program which is offered in Face-to-Face Mode.
- ii. The Department of Computer Science is offering BS (CS) Program at Main Campus, Islamabad.
- iii. The BS (CS) Program is also being offered at selected Regional Centers of AIOU. Under this program, the course work will be conducted through video-conferencing/internet. Distance Education will be delivered by faculty members from Department of Computer Science, Main Campus. A local faculty member/staff will be provided to assist in administrative and lab assignments

7.4 Assessment and Evaluation

See Page vi

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ii. Deputy Program Coordinator

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iii. Admission Cell at DCS

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BS (INFORMATION TECHNOLOGY) 4-YEAR PROGRAM

1. Introduction

In this era of technological revolution, education regarding Information Technology and its application is required. The Department of Computer Science, in keeping with the needs of the modern education requirement in technology, is revamping and reintroducing a Bachelors in Information Technology program. The BS (Information Technology) gives the students an in-depth knowledge of programming, system analysis and software testing. The curriculum of the BS (IT) program includes coursework in computing, mathematic, databases, software development and testing, modeling, introduction to classical Information Technology languages and case studies. The curricula is specifically designed to meet with the requirements of an expert software developer. The program also encourages students to take courses in ethics and social responsibility, with the opportunity to participate in long term projects in which Information Technology.

i. Objectives

- i. Develop proficiency in programming languages used in Information Technology.
- ii. Develop strong analytical skills to understand and to analyze the different paradigms of Information Technology.
- iii. Learn to manipulate different programming language and frameworks.

- iv. Develop an understanding related to usage of data ethics.
- v. Learn to develop new frameworks including for solving different problems.

3. Eligibility

Minimum 50% marks in Intermediate/12 years schooling/A- Level (HSSC) or Equivalent with Mathematics are required for admission in BS(CS). Equivalency certificate by IBCC will be required in case of education from some other country or system. The students who have not studied Mathematics at intermediate level have to pass deficiency courses of Mathematics in first two semesters.

The departmental admission committee shall determine the eligibility accordingly.

4. Duration of Program

- i. The BS (IT) is 133 credit hours' program and may be completed in minimum four years (eight semesters).
- ii. Two semesters are offered in a year as Spring and Autumn.
- iii. Duration of each semester is 16 weeks.
- iv. The maximum time limit to complete the BS (IT) Program is Six Years from the date of first registration of the student in this program.

5. Scheme of Study

Semester-1

Course Code	Title	Credit Hours
CS 3504	Computer Programming	4(3+1)
CS3503	Applications of Information & Communication Technologies	3(2+1)
MATH 3516	Discrete Mathematics	3(3+0)
MATH 3502	Calculus-I	3(3+0)
Engl 3505	Functional English	3(3+0)
MATH 3517	Pre-Calculus 1	Deficiency
Total Credit Hours		16

Semester-2

Course Code	Title	Credit Hours
CS 3506	Object Oriented Programming	4(3+1)
CS 3507	Database Systems	4(3+1)
CS 3508	Digital Logic Design	3(2+1)
MATH 3509	Calculus-II	3(3+0)
MATH 3512	Linear Algebra	3(3+0)
MATH 3518	Pre-Calculus 2	Deficiency
Total Credit Hours		17

Semester-3

Course Code	Title	Credit Hours
CS 4521	Data Structures	4(3+1)
CS 4522	Information Security	3(2+1)
CS 5423	artificial Intelligence	3(2+1)

CS 4524	Computer Networks	3(2+1)
CS 4525	Software Engineering	3(3+0)
STAT 4509	Probability & Statistics	3(3+0)
Total Credit Hours		19

Semester-4

Course Code	Title	Credit Hours
CS 5526	Computer Organization & Assembly Language	3(2+1)
CS 5507	Web Technologies	3(2+1)
CS 5512	Cyber Security	3(2+1)
PHY 4509	Applied Physics	3(2+1)
ENGL3504	Expository Writing	3(3+0)
ITHC3501/ HADH3501	Islamic Studies/Ethics	2(2+0)
Total Credit Hours		17

Semester-5

Course Code	Title	Credit Hours
CS 5502	Operating Systems	3(2+1)
CS 5518	DB Administration & Management	3(2+1)
CS 5519	System & Network Administration	3(2+1)
CS 6502	Analysis and Design of Algorithms	3(3+0)
CS 5504	Computer Architecture	3(2+1)
MGT354	Introduction to Management	2(2+0)
TESR	Fahm-E-Quran (Tajwid,	(NC)

3501	Translation and Tafsir)	
Total Credit Hours		17

Semester-6

Course Code	Title	Credit Hours
CS 6508	Information Technology Infrastructure	3(2+1)
CS 5506	Parallel & Distributed Computing	3(2+1)
CS 6509	Network Security	3(2+1)
CS 6510	Enterprise Systems	3(2+1)
CS 6511	Web Engineering	3(2+1)
CS 427	Theory of Automata	3(2+1)
SERT 3501	Seerat-e-Tayyaba	(NC)
Total Credit Hours		18

Semester-7

Course Code	Title	Credit Hours
CS 6501	Final Year Project - I	2(0+2)
CS 6511	Virtual Systems & Services	3(2+1)
CS 6512	Human Computer Interaction	3(2+1)
CS 6503	IT Marketing Concepts	3(3+0)
ENGL 3503	Technical & Business Writing	3(3+0)
MGT3503	Entrepreneurship	2(2+0)
CS 6507	Internship	3 (0+3)
Total Credit Hours		19

Semester-8

Course Code	Title	Credit Hours
CS 6504	Final Year Project -II	4 (0+4)
PKST3502	Ideology and Constitution of Pakistan	2(2+0)
CS 6506	Professional Practices	2(2+0)
SOC3503	Civics and Community Engagement	2(2+0)
Total Credit Hours		10

The Department of Computer Science reserves the right to offer or may not offer listed specialization area or a particular course depending upon the available faculty/laboratory resources and viable student's enrollment. The department may add other specialized areas or may add elective courses to any specialized defined area.

6. Fee Tariff

Item	-
Registration Fee: (At the time of 01 st admission)	Rs. 600/-
Admission Fee: (At the time of 01 st admission)	Rs. 1210/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee (Each semester)	Rs. 600/-
Fee for 3 Credit Hour Courses (04 courses in First Semester with 03	RS. 38720/-

Credit Hours) 04 x 6000 = 24000	
Lab Fee	Rs. 6050/-
Total Fee for First Semester	Rs. 48680/-

7. Mode of Study

a. Medium of Instruction

The medium of instruction for BS (IT) Program is English.

7.2 Study Material

The class teacher will provide the study material. However, the students are advised to consult books from the list of recommended books.

7.3 Mode of Teaching

- The BS (IT) program is a non-merit program which is offered in Face-to-Face Mode.
- The Department of Computer Science is offering BS (IT) Program at Main Campus, Islamabad.
- The BS (IT) Program is also being offered at selected Regional Centers of AIOU by using modern technologies. Under this program, the course work will be conducted through video-conferencing/internet. Distance Education will be delivered by faculty members from Department of Computer Science, Main Campus. A local faculty member/staff will be provided to assist in administrative and lab assignments. All assessments will be performed as per rules of the University.

7.4 Assessment and Evaluation

See page vi

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Department of Agricultural Sciences

Department of Agricultural Sciences (DAS) is making earnest efforts aiming at supplementing, supporting and re-enforcing extension services and offering agriculture related programs at different levels. Agriculture progress in most developing countries has mainly involved an increase in the production of staple crops, the introduction of industrial crops and development of livestock production. One cannot deny the importance of livestock because it produces a huge quantity of food, such as beef, mutton, poultry meat, milk, yogurt and lot of other milk, and animal byproducts. Millions of acres are still being cultivated with the help of farm animals in this mechanized era. At present, higher education in agriculture is imparted by four formal agricultural universities in Pakistan, which are not catering in-service personnel. The AIOU conducted a survey to get an idea about the higher education in Livestock Management Agricultural Extension, Forestry Extension and Rural Development and received a positive response from candidates who could not improve their qualification from formal Agricultural Universities for one or other reason and are now working in different governmental departments and NGOs. DAS has decided to offer MSc (Hons) Rural Development through distance teaching system, especially for those who could not enhance their qualification through formal system.

Objectives

To help literate farmers and rural communities generally to improve their everyday farming operations and basic skills; to improve the level of knowledge and skills of field extension staff by drawing on the latest research

findings and expertise at the national and international levels; to help in adoption and diffusion of improved technology among the farming population. To promote human resource development in agriculture and its related fields. Supplementing, supporting and reinforcing extension services and offering agriculture related programs at different levels.

Scheme of studies of B.Sc. (Hons.) Agriculture

Salient Features of the Program

- **Eligibility Criteria:** Pre-medical & Pre-engineering or diploma holders (3-year Diploma of field assistant or in field of agriculture) from national and international HEC recognized institutions.
- **Program Duration:** 08 semesters spread over 04 years
- **Medium of Instruction:** The medium of instructions and examinations will be in English
- **Mode of Learning:** This program shall be offered on Face to Face Mode
- **Degree Requirement:** 129 Credit Hours (After completing the four semesters, the students will have the option to opt one discipline from Horticulture, Agronomy and Soil Science.

Scheme of Studies

Semester 1

Name of Subject	Academic Cluster	Credit Hours	Course Code
Functional English	Functional English	3(3+0)	ENGL3505
Ideology and Constitution of	Ideology and Constitution	2(2+0)	PKST3502

Pakistan			
Quantitative Reasoning	Quantitative Reasoning-I	3(3+0)	MATH3508
Islamic Studies / Ethics	Islamic Studies / Ethics	2(2+0)	ITHC3501/HADH 3501
Pakistani Adab-1	Arts and Humanities	2(2+0)	URD3503
Cell Biology	Interdisciplinary	3 (2+1)	TBA
Total		15	

Semester 2

Name of Subject	Academic Cluster	Credit Hours	Course Code
Quantitative Reasoning-II	Quantitative Reasoning-II	3(3+0)	MATH4505
Application of Information Communication & Technologies	ICT	3(2+1)	CS3503
Expository Writing	Expository Writing	3(3+0)	ENGL3504
Civics and Community Engagement	Civics and Community Engagement	2(2+0)	SOC3503
Introduction to sociology	Social Sciences	2(2+0)	SOC3506
Introduction to Agriculture Extension	Major	3 (3+0)	AGSI3506
Total		16	

Semester 3

Name of Subject	Academic Cluster	Credit Hours	Course Code
Entrepreneurship	Entrepreneurship	2(2+0)	MGT3503
Basics of Environmental Science	Natural Sciences	3(2+1)	ENVS4501
Basic Agriculture	Major	3(2+1)	AGSI3501
Introduction to Plant Breeding and Genetics	Major	3(2+1)	AGSI4507
Introduction to Animal Husbandry	Interdisciplinary	3(2+1)	AGSI3502
Introductory Horticulture	Major	3(2+1)	AGSI4508
Total		17	

Semester 4

Name of Subject	Academic Cluster	Credit Hours	Course Code
Horticultural Crop Production	Major	3(2+1)	AGSI4504
Field Crop Production	Major	3(2+1)	AGSI4509
Introductory Entomology	Major	3(2+1)	AGSI4510
Introduction to Soil Science	Major	3(2+1)	AGSI4511
Introductory Plant Pathology	Major	3(2+1)	AGSI4512
Forestry and Range Management	Major	3(2+1)	AGSI4513
Total		18	

Major Horticulture 5th Semester

Name of Subject	Academic Cluster	Credit Hours	Course Code
Principles of Fruit Production	Major	3(2+1)	AGSI5513
Principles of Vegetable Production	Major	3(2+1)	AGSI5514
Principles of Ornamental Crop Production	Major	3(2+1)	AGSI5515
Propagation and Nursery Management	Major	3(2+1)	AGSI5516
In Vitro Propagation	Major	3(2+1)	AGSI5517
Breeding of Horticultural Crops	Major	3(2+1)	AGSI5518
Fahm-e- Quran, Tajwid Translation and Tafsir	Compulsory course	Noncredit	TFSR3501
Total		18	

6th Semester

Name of Subject	Academic Cluster	Credit Hours	Course Code
Tropical and Sub-Tropical Fruits	Major	3(2+1)	AGSI5519
Summer Vegetables	Major	3(2+1)	AGSI5520
Landscape Horticulture	Major	3(2+1)	AGSI5521
Medicinal and	Major	3(2+1)	AGSI5522

Aromatic Plants			
Post-Harvest Horticulture	Major	3(2+1)	AGSI5523
Mushroom Culture	Major	3(2+1)	AGSI5524
Seerat-e-Tayyaba	Compulsory course	Noncredit	SERT3501
Total		18	

7th Semester

Name of Subject	Academic Cluster	Credit Hours	Course Code
Research and Scientific Writing	Interdisciplinary	3(2+1)	AGSI6508
Temperate Fruits	Major	3(2+1)	AGSI6509
Winter Vegetables	Major	3 (2+1)	AGSI6510
Commercial Flower Production	Major	3 (2+1)	AGSI6511
Vegetable and Flower Seed Production	Major	3(2+1)	AGSI6512
Agribusiness, Marketing, and Trade	Interdisciplinary	3(3+0)	AGSI6513
Total		18	

8th Semester

Name of Subject	Academic Cluster	Credit Hours	Course Code
Internship	Major	3(0+3)	AGSI6514
Capstone Project	Major	3(0+3)	AGSI6515
Total		6	
Grand Total		129	

**Major Agronomy
5th Semester**

Name of Subject	Academic Cluster	Credit Hours	Course Code
Plant Nutrients and Growth Regulators	Major	3(2+1)	AGSI5525
Agro-technology of Major Field Crops	Major	3(2+1)	AGSI5526
Irrigation Agronomy	Major	3(2+1)	AGSI5527
Field Crop Physiology	Major	3(2+1)	AGSI5528
Agro-Ecology	Major	3(3+0)	AGSI5529
Arid and Rainfed Agriculture	Major	3(2+1)	AGSI5530
Fahm-e- Quran, Tajwid Translation and Tafsir	Compulsory course	Noncredit	TFSR3501
Total		18	

6th Semester

Name of Subject	Academic Cluster	Credit Hours	Course Code
Crop Management under stressful Environments	Major	3(2+1)	AGSI5531
Seed Production Technology	Major	3(2+1)	AGSI5532
Introduction to Weed Science	Major	3(2+1)	AGSI5533
Conservation Agronomy	Major	3(2+1)	AGSI5534
Climate Change and Crop Production	Major	3(2+1)	AGSI5535

Climate Smart Agriculture in Pakistan	Major	3(3+0)	AGSI5512
Seerat-e-Tayyaba	Compulsory course	Noncredit	SERT3501
Total		18	

7th Semester

Name of Subject	Academic Cluster	Credit Hours	Course Code
Forage and Fodder Production	Major	3(2+1)	AGSI6516
Research and Scientific Writing	Interdisciplinary	3(2+1)	AGSI6517
Principles of Weed Science	Major	3(2+1)	AGSI6518
Farming system and Record Management	Major	3(2+1)	AGSI6519
Agribusiness, Marketing, and Trade	Interdisciplinary	3(3+0)	AGSI6520
Organic Farming	Major	3(2+1)	AGSI6521
Total		18	

8th Semester

Name of Subject	Academic Cluster	Credit Hours	Course Code
Internship	Major	3(0+3)	AGSI6514
Capstone Project	Major	3(0+3)	AGSI6515
Total		6	
Grand Total		129	

**Major Soil Science
5th Semester**

Name of Subject	Academic Cluster	Credit Hours	Course Code
Trace Elements in Agriculture	Major	3(2+1)	AGSI5536
Physical Properties of Soil	Major	3(2+1)	AGSI5537
Chemical Properties of Soil	Major	3(2+1)	AGSI5538
Instrumentation and Laboratory Techniques	Major	3(1+2)	AGSI5539
Soil Genesis and Morphology	Major	3(2+1)	AGSI5540
Municipal and Agro Waste Management	Major	3(3+0)	AGSI5508
Fahm-e- Quran, Tajwid Translation and Tafsir	Compulsory course	Noncredit	TFSR3501
Total		18	

6th Semester

Name of Subject	Academic Cluster	Credit Hours	Course Code
Salt-Affected Soils and Water Quality	Major	3(2+1)	AGSI5541
Soil Fertility and Fertilizer Use	Major	3(2+1)	AGSI5542
Soil Survey and Land Evaluation	Major	3(2+1)	AGSI5543
Soil and Water Conservation	Major	3(2+1)	AGSI5544
Plant Resource	Major	3(2+1)	AGSI5509

Utilization			
Climate Smart Agriculture in Pakistan	Major	3(3+0)	AGSI5512
Seerat-e-Tayyaba	Compulsory course	Noncredit	SERT3501
Total		18	

7th Semester

Name of Subject	Academic Cluster	Credit Hours	Course Code
Soil Microbiology	Major	3(2+1)	AGSI6522
Research and Scientific Writing	Interdisciplinary	3(2+1)	AGSI6523
Soil - Water - Plant Relationship	Major	3 (3+0)	AGSI6524
Land Degradation and Management	Major	3 (3+0)	AGSI6525
Agribusiness, Marketing, and Trade	Interdisciplinary	3 (3+0)	AGSI6526
Carbon Sequestration in Soil	Major	3(2+1)	AGSI6527
Total		18	

8th Semester

Name of Subject	Academic Cluster	Credit Hours	Course Code
Internship	Major	3(0+3)	AGSI6514
Capstone Project	Major	3(0+3)	AGSI6515
Total		6	
Grand Total		129	

Evaluation and Assessment
See page vi

Fee Tariff

Registration Fee	Rs. 600/-
Admission Fee	Rs. 1200/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs. 600/-
Fee for per 1 credit hour 850 x 15	Rs. 12750/-
Total Fee	Rs. 16650/-

The origin of the Faculty of Education pre-dates the university itself. The National Institute of Education was established in 1973 under the Federal Ministry of Education. It became part of the university in June, 1975 as Institute of Education in the then Faculty of Social Sciences. The progressively extending functions of the institute brought the needs for structural change and in 1984 it got the status of Faculty of Education.

DEPARTMENTS OF THE FACULTY

Faculty of Education Comprises of the following Six Departments:

1. Distance, Non-Formal and Continuing Education
2. Educational Planning, Policy Studies and Leadership
3. Early Childhood Education and Elementary Teacher Education
4. Secondary Teacher Education
5. Science Education
6. Special Education

Distance, Non Formal Education and Continuing Education

The department was established in 1984 and was later renamed as Distance, Non Formal and Continuing Education This department offers PhD, MPhil, Masters and specialized courses in B.Ed 1.5 program. The department also offers certificate courses in literacy and non-formal education.

FACULTY OF EDUCATION

Educational Planning, Policy Studies and Leadership (EPPSL)

The department was established in 1976 was renamed as EPPSL in 2008. It offers programs in educational planning management and leadership. These programs are aimed at producing a managerial cadre of professionals for the educational institutions and organizations in the country. Programs of EPPSL include B.Ed, Postgraduate Diploma, MA (EPM), MPhil and PhD in Educational Planning and Management as well as online courses. The courses of these programs are in accordance with the field requirements of target personnel in the areas of educational planning, management and leadership.

Secondary Teacher Education

The Department of Teacher Education was established in 1985 and was bifurcated into Secondary and Elementary Teacher Education Departments in July 2003. Its programs aim at imparting academic and professional knowledge and training to in-services and pre service teachers and scholars.

The programs/courses of this department comprise MA, MEd BEd (4 years) and BS Instructional Design and Technology as

professional degree programs. The department also offers MPhil and PhD in Education, which are aimed to prepare highly skilled professionals and leaderships in the field of teacher education.

Early Childhood Education and Elementary Teacher Education

The Department of Elementary Teacher Education was established in 2003. In April 2008, the name of Elementary Teacher Education Department was changed as Early Childhood Education and Elementary Teacher Education Department. The Department offers Associate Degree in Education, Post Graduate Diploma in ECE, BEd (1.5 year), BEd (2.5), BEd (4 years), MPhil and PhD program, it also offers “Education” as subject at Matric, Intermediate and Graduate level. The department is planning to launch, BS (ECCE) and Certificate of Entrepreneurship in ECCE. The department also plans to offer non-credit research courses and postgraduate diploma for teaching in higher education.

Science Education

The Department of Science Education was established in 1988. The programs and courses of the department are mainly focused on education and training of mathematics and science teachers. Presently the department offers specialized courses in science education at undergraduate and postgraduate level. Specialized courses provide conceptual framework and insight into the teaching of science. The department offers BEd (4 year) BEd (2.5 year) and specialization of Science Education in BEd (1.5 year) and MEd. MPhil and PhD programs; in science education are also offered at the department.

Special Education

The Department was established in 1985. The department imparts education and training to teachers for the special children in four specializations namely visual impairment, hearing impairment, intellectual disabilities, physical disabilities and mental retardation with particular emphasis to facilitate inclusive education. Parents of the special children are also admitted to these programs. Present programs/courses of this department comprise B.Ed (4 years), MEd, MA, MPhil and PhD in the field of Special Education.

BS HEALTH AND PHYSICAL EDUCATION

Program Name:	BS Health and Physical Education
Duration of Program:	4 Years (8 Semesters)
Admission Criteria	FA/F.Sc or equivalent
Semester Duration:	16-18 Weeks
Total Credit Hours:	136 (Theory= 113 & Practical= 23)
Medium of Instruction:	English
Mode of Delivery:	Face to Face
Passing Marks (Assignment/Exam):	50% / As per AIOU policy

Rationale

The Program in BS Health and Physical Education is an essential need of Pakistan in the current socio-political scenario. The program will indirectly contribute to promoting tolerance and mutual co-existence in society. Therefore, the government of Pakistan has introduced the program as per National Policy and one compulsory seat of physical education instructor/ teacher has also been created in every school and college.

Allama Iqbal Open University in collaboration with the Pakistan Sports Board had already successful experience of offering the diploma, graduate, and postgraduate programs in Physical Education in 2006, which were accordingly approved by all the Statutory bodies of AIOU. The program provided face-to-face education and intensive practical training at the multifarious sports infrastructure spread over the vast Pakistan sports complex.

STED plans to launch BS Health and Physical Education, initially, the program was approved on blended mode and the scheme of studies was approved by all statutory bodies. Based upon HEC Undergraduate Policy 2023 Scheme of Studies has been revised.

All the modalities related to admission, fee structure, hiring study center (human and physical resources), formative and summative assessment, and certification will be as per the BS policy of AIOU.

Objectives of the Program

In the era of the educational revolution, the main objective of the BS (4-Years) program in Health and Physical Education is to prepare graduates to have a deep knowledge of the subjects as well as the ability to analyze a given situation and draw conclusions. The program aims to produce a broad base of graduates able to face the challenges of the modern world.

The Educational objectives of the program are:

- BS Health and Physical Education is designed to produce graduates with sound knowledge of the theoretical and practical subject matter.
- Along with the knowledge of the subject they would also have a broader view of other disciplines of social as well as physical sciences. It will enable the students to interact with other branches of knowledge and strengthen their understanding of society.
- The graduates are equipped with essential tools and techniques of research. It will enable them to analyze any given situation/ issue and suggest possible solutions.
- The graduates are to be empowered to establish and develop a viable and forceful line between theory/concepts and practice in Physical Education and Sport Sciences.

- The collective efforts behind this course are to create cohesiveness among the institutions and personnel of sports and physical education.
- The similarity among the outlines has been developed to interrelate the discipline in the global perspective creating an environment of healthy competition and equal opportunities for all at national and international levels.

Modus Operandi:

- The program will be offered initially in collaboration with PSB/Regional Directors/Relevant Institutions.
- Physical classes of practical courses will be held at the institutions/ practical centers with indoor and outdoor sports facilities.
- Regional directors may arrange the study centers with the availability of sports infrastructures to run the program in their regions.
- The department will monitor classes/practicals to ensure and maintain program quality.

Entry Qualification and Selection Criteria for Admission

Selection for admission to the program will be based on merit. FA/F.Sc or Equivalent is the eligibility criteria. Number of seats will be determined based on the availability of practical centers.

Semester-wise Break-up of Scheme of Studies

Course Code	Course Title	Credit Hours	Nature
SEMESTER 1			
ENGL3505	Functional English	3+0	GC
MATH3508	Quantitative Reasoning-I	3+0	GC
5950	Philosophical Basis of Physical Education	3+0	MC
5951	Rules And Techniques of Games	3+0	MC
5952	Games-I	1+1	MC
5953	Athletics-I	1+1	MC
Total Credit Hours (Theory + Practical) 14+2 =16			
SEMESTER 2			
ENGL3504	Expository Writing	3+0	GC
ITHC3501/ HADH3501	Islamic Studies/Ethics	2+0	GC
ENVS4501	Basics of Environmental Sciences	2+1	GC
5955	Sports Bio Mechanics	3+0	MC
5956	Games-II	1+1	MC
5957	Athletics-II	1+1	MC
5958	Gymnastic-I	0+1	MC
Total Credit Hours (Theory + Practical) 12+4 =16			
SEMESTER 3			

PKST3502	Ideology and Constitution of Pakistan	3+0	GC
CS3503	Application of Information and Communication Technologies	2+1	GC
5959	Talent Identification in Sports	3+0	MC
5961	Games-III	1+1	MC
5962	Athletics-III	1+1	MC
MATH4505	Quantitative Reasoning II	3+0	GC
URD3503	Urdu Adab-1	2+0	GC
Total Credit Hours (Theory + Practical) 15+3=18			
SEMESTER 4			
SOC3503	Civics and Community Engagement	2+0	GC
5976	Sport Psychology	3+0	MC
5964	Administration and Management in Sports	3+0	MC
SOC3506	Introduction to Sociology	3+0	GC
5967	Games IV	0+1	MC
5968	Practical Athletics-IV	0+1	MC
MGT3503	Entrepreneurship	2+0	GC
Total Credit Hours (Theory + Practical)13+2=15			
SEMESTER 5			
5969	Science of Sports Training	3+0	MC

6413	Introduction to Inclusive Education	3+0	IDC
5971	Physical Education for Special Population	3+0	MC
5970	Sports Nutrition	3+0	MC
5966	Basics of Human Physiology	3+0	MC
5963	Gymnastic-II	1+1	MC
TFSR3501	Fahm-e-Quran (Tajwid, Translation and Tafsir)	-	Non-Credit
Total Credit Hours (Theory + Practical) 16+ 1 =17			
SEMESTER 6			
5972	Specialization in one group of Track and Field	1+2	MC
9452	Introduction to Social Work	3+0	IDC
5973	Research Methodology in Physical Education	3+0	MC
5954	Biochemistry	3+0	MC
5975	Test, Measurement, and Evaluation in Sports	3+0	MC
SERT3501	Seerat-e-Tayyaba	-	Non-Credit
To Be Attained	Internship	0+3	Internship
Total Credit Hours (Theory + Practical) 13+5=18			
SEMESTER 7			
5978	Common Sports Injuries & Common Treatment	3+0	MC

	and Rehabilitation		
5980	Role of Media in Sports	3+0	MC
5974	Planning Sports Facilities	3+0	MC
8611	Critical Thinking & Reflective Practices	3+0	IDC
5981	Scientific Sport Coaching	3+0	MC
5982	Specialization in one game	1+2	MC
Total Credit Hours (Theory + Practical) 16+2=18			
SEMESTER 8			
5984	Sports Medicines	3+0	MC
5979	Exercise Physiology	2+1	MC
8255	Organizational Behavior	3+0	IDC
5985	Curriculum Development in Physical Education	3+0	MC
5986	Wellness and Fitness /Fitness	3+0	MC
TBA	Capstone Project	0+3	CP
Total Credit Hours (Theory + Practical) 14+4=18			

GC= General Education Cluster = 12 Courses offered in first 4 semesters

MC= Major Course= 33 Courses (15 in first 4 semesters and 18 in the last 4 semesters)

IDC= Interdisciplinary Course= 4 Courses offered in last 4 semesters

Non Credit=

2

Courses offered in 5th and 6th Semesters

Internship

Offered in 6th Semester

CP= Capstone Project

Offered in 8th Semester

Assessment Criteria

See page vi

For Theory Courses

S.No.	Components	Total Marks	Weightage	Passing Marks
1	Assignment	10	20%	50% (In aggregate)
2	Assignment 2	10		
3	Mid Term	30	30%	
4	Attendance	100	Nil	70%
5	Final Exam	100	50%	50%

For Theory-Practical Courses

S.No.	Components	Total Marks	Weightage	Passing Marks
1	Assignment	10	20%	50% (In aggregate)
2	Assignment 2	10		
3	Mid Term	15	30%	
4	Practical	15		
5	Attendance	100	Nil	70%
6	Final Exam	100	50%	50%

For Practical/FYP Courses

S.No.	Components	Total Marks	Weightage	Passing Marks
1	Attendance	100	Nil	70%
2	Final Exam	100	100%	50%

Fee Tariff

Registration Fee	Rs. 600/-
Admission Fee	Rs. 1210/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs. 600/-
Fee for per 1 credit hour 2420	38720/-
Total Fee	Rs. 42630/-

**BS Instructional Design and Technology Programme
Secondary Teacher Education Department (STED)**

Introduction

In increasingly technology-driven educational landscape, it is imperative that 21st century learners upgrade their skills and become proficient in the use of technology in every walk of life and to effectively facilitate the learning process. Educators and other professionals therefore must be able to design, deliver and manage learning environments both face-to-face and online. While embracing this paradigm shift of technology, Secondary Teacher Education Department (STED) has launching BS Education in Instructional Design and Technology Program. Overall this

program focuses on instructional design process, learning theories, models, strategies, media, communication delivery models and interactive technologies, web designing and programming etc.

Therefore, using the principles and practices of adult education, this program concentrates on following three areas:

- Building a foundation and conceptual framework for educational and instructional design process.
- Developing instructional strategies and skills to facilitate adult learning.
- Using media, web and other ICTs to support learning.

Program Name B.S Instructional Design and Technology

Programme Duration: 4 years (8 Semesters)

Admission Criteria FA/F.Sc or equivalent

Semester Duration: 16-18 weeks

Total Programme Credit Hours 134 Credit Hours

Total Number of courses: 47 courses including Internship and Research Project

Medium of Instruction: English

Delivery Mode: Face to Face

Pass Marks: 50%

**Semester-wise Break-up of BS Instructional Design
and Technology Program for Face to Face Offering**

SEMESTER 1

Sr. No	Course Code	Courses	Nature of Course	Credit Hours (Theory + Practical)
1.	ENGL3505	Functional English	GE1	3+0
2.	PKST3502	Ideology and Constitution of Pakistan	GE 2	2+0
3.	MATH3508	Quantitative Reasoning-I	GE 3	3+0
4.	8247	Educational Psychology & Guidance	D 1	3+0
5.	8248	Technology and Learning	D 2	3+0
6.	CS3503	Application of Information and Communication Technologies	D 3	2+1

Total Credit Hours 16+01=17

SEMESTER 2

Sr. No	Course Code	Courses	Nature of Course	Credit Hours (Theory + Practical)
1.	8257	Introduction to Instructional	D 4	3+0

		Design		
2.	8252	Learning Styles and Learning Environment	D5	3+0
3.	8253	Curriculum and Instruction	D 6	3+0
4.	ENVS 4501	Basics of Environmental Sciences	GE4	2+1
5.	8254	Classroom Management	D7	3+0
6.	8334	Introduction to Web Based Instructions	D8	3+0
Total Credit Hours			17+1=18	

SEMESTER 3

SEMESTER 4				
Sr. No	Course Code	Courses	Nature of Course	Credit Hours (Theory + Practical)
1.	ITHC/ HADH3501	Islamic Studies/Ethics	GE9	2+0
2.	6902	Object Oriented Programming	D11	3+1
3.	8251	Introduction to Open Educational Resources	D12	3+0
4.	6944	Expository Writing	GE10	3+0
5.	SOC3503	Civics & Community Engagement	GE 11	2+0
6.	8269	Learning Management Systems and Organizations	D13	3+0
7.	URD3503	Pakistani Adab -I	GE12	2+0
Total Credit Hours				18+1=19

SEMESTER 5

Sr. No	Course Code	Courses	Nature of Course	Credit Hours (Theory +
				+

Sr. No	Course Code	Courses	Nature of Course	Credit Hours (Theory + Practical)
1.	6900	Computer Programming	D 9	3+1
2.	MATH4505	Quantitative Reasoning II	GE5	3+0
3.	8263	Instructional Strategies and Assessment Methods	D10	3+0
4.	ENGL3504	Expository Writing	GE6	3+0
5.	MGT3503	Entrepreneurship	GE7	2+0
6.	MGT3504	Introduction to Management	GE8	2+0
Total Credit Hours				16+0=17

1.	8261	Educational Research and Statistics	D14	3+0
2.	8262	Education in Pakistan	D15	3+0
3.	5908	Web Design-I (website design & development)	D16	3+1
4.	3499	Mobile Application Development	ID1	2+1
5.	8270	Developing Instructional	D17	3+0

		Media		
6.	TFSR3501	Fahm-e-Quran (Tajwid, Translation and Tafsir)		0+3
		Total Credit Hours	14+ 02=16	
SEMESTER 6				
Sr. No	Course Code	Courses	Nature of Course	Credit Hours (Theory + Practical)
1.	5914	Web Design-II (Advanced design & development skills)	D18	3+1
2.	8335	Trends and Issues in Instructional Design	D19	3+0
3.	8330	Visual and Verbal Communication in Instructional Design	D20	3+0
4.	8264	Ethical use of Instructional Material (proper usage of resources)	D21	3+0
5.	8265	Internship (Institution)	D22	0+3
6.	SERT3501	Seerat-e-Tayyaba	-	0+3
		Total Credit Hours	12+04=16	
SEMESTER 7				

Sr. No	Course Code	Courses	Nature of Course	Credit Hours (Theory + Practical)
1.	8266	Instructional Designs: Theories and Models	D23	3+0
2.	8331	Systems Approach to Designing Instructional Materials	D24	3+0
3.	8259	Educational Measurement and Evaluation	D25	3+0
4.	8255	Organizational Behavior	ID26	3+0
5.	8332	Multi-media Applications in Education	D27	3+1
6.	5915	Internship (Software house)	D28	0+3
		Total Credit Hours	15+04=19	
SEMESTER 8				
Sr. No	Course Code	Courses	Nature of Course	Credit Hours (Theory + Practical)
1.	8267	Higher Education	D29	3+0
2.	8268	Future Challenges in Education	D30	3+0
3.	8333	Capstone Project	D31	0+3

4.	8258	Foundations in Education	D32	3+0
Total Credit Hours			9+3=12	

Note: Department has right to change the offering of courses as per requirement.

GE= General Education
Discipline

D=Major Courses from
ID=Inter disciplinary

Fee for a 3 CH course will be 6000/-PKR as per university policy.

Lab Charges will be applicable only the semester in which lab work will be involved.

Assessment Criteria

See page vi

For Theory Courses

S.No.	Components	Total Marks	Weightage	Passing Marks
1	Assignment	10	20%	50% (In aggregate)
2	Assignment 2	10		
3	Mid Term	30	30%	
4	Attendance	100	Nil	70%
5	Final Exam	100	50%	50%

For Theory-Practical Courses

S.No.	Components	Total Marks	Weightage	Passing Marks
1	Assignment	10	20%	50% (In
2	Assignment 2	10		

3	Mid Term	15	30%	aggregate)
4	Practical	15		
5	Attendance	100	Nil	70%
6	Final Exam	100	50%	50%

For Practical/FYP Courses

S.No.	Components	Total Marks	Weight age	Passing Marks
1	Attendance	100	Nil	70%
2	Final Exam	100	100%	50%

Fee Tariff

Registration Fee	Rs. 600/-
Admission Fee	Rs. 1210/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs. 600/-
Fee for per 1 credit hour 2420	Rs. 38720/-
Total Fee	Rs. 42630/-

GENERAL INFORMATION

- The certificates/degrees of AIOU are equivalent to any other recognized Board/University.
- A candidate is required to submit complete admission form and upload scan documents through online system before or on the closing date.
- If an applicant of post-graduate/research level programme does not receive any information regarding admission within three months from submission of application, he/she should presume non-selected.
- A course taken by any student cannot be changed during the semester.

- v. The address of a student will not be changed during the semester.
 - vi. Admission to courses for both the Spring and Autumn semesters are generally being offered in the months of January and July, respectively, whereas, examinations commenced in November and May respectively. The and deposit fee within due date.
 - vii. On payment of the registration fee, each student will be issued a student ID. This number must be quoted in all the future correspondence along with the Student, course(s), code numbers and semester.
 - viii. Study material shall be available on university website. University will not provide hard copy of books.
 - ix. Rules and regulations framed, enhanced and changed from time to time by the authorities, bodies of the university will be effective as deemed necessary. The student will have to abide by all such rules and regulations from the date of their implementation.
 - x. A student who fails in continuous assessment component is not eligible to reappear but will be allowed to re-enroll for the same course at its next offering semester by the university.
 - xi. It is the responsibility of the student to remain in touch with the department regarding the selected programme.
 - xii. A student already admitted to a programme or a specialization of a programme shall not be allowed to transfer or to get admission to another programme unless he/she formally postpones, it till the completion of the new programme or withdraw from the previous programme.
 - xiii. After completion of a programme successfully, a student has to apply to Controller of Examinations for issuance of certificate/degree.
 - xiv. The university reserves the right to change contents of this prospectus without any prior notice as per university policy.
 - xv. In case of discrepancies in the name of student/ Father's name of the student or difference in name mentioned in his/her other educational certificates, the name on the Matric certificate of the student will be considered as correct name. The Examination Department shall also issue certificate/ degree on the said name.
 - xvi. In case provision of forged documents for admission, not only the admission will be refused to the applicant but the fee deposited by him/her will also be forfeited. The university may proceed further in the matter.
 - xvii. If any mistake found in compilation or declaration of result at any stage.
 - xviii. If any candidate found ineligible for a degree/diploma/certificate during the cross verification process of result and documents at any stage.
 - xix. If found that candidate submitted forged/fake illegal documents(s) in the University at any stage.
- Note:** Withdrawal/ Invalid/ Revoke/ Quash of degree/ diploma/ certificate for the reasons listed above (xvii-xix) shall be made any time with no legal restriction of time period. This action shall not be challengeable in the court(s) or at any legal forum.
- PROCEDURE FOR DEPOSITING FEE**
- Applicants will deposit admission processing fee (Rs.500) in designated banks or through Telcos.
 - Eligible candidates for (**Merit Based Programmes**) are required to deposit admission fee in any branch of the following banks:

1. First Women Bank Limited (FWBL)
 2. Allied Bank Limited (ABL)
 3. Muslim Commercial Bank (MCB)
 4. United Bank Limited (UBL)
 5. National Bank of Pakistan (NBP)
- Fee can also be Deposited through Jazz Cash, Easy Paisa and Upaisa Mobile App/USSD String *786#, Retailer Agent, Franchise and Branches of Mobilink, Telenor and Ubank. For more detail please visit university website.
 - The Banks/Mobile App/Retailer Agents/Franchise/Branches will provide Transaction ID of deposited fee.

Note: Beware that University has not authorized any person or private institute to collect payment/forms. All the students are instructed to deposit fee by themselves in designated bank branches. In case of any discrepancy in admission fee/admission form the University will not be responsible and the student will have to face the consequences.

PROCEDURE OF FEE DEPOSIT THROUGH TELECOS

Easypaisa Through Easypaisa App

The account may be created after downloading the Easypaisa Mobile App from Playstore. For using this mode, student must have balance equal to his/her payable fee in Easypaisa mobile account. There are **no transactions charges**, if student use this mode to pay his/her fee. Following is the procedure of fee payment through Easypaisa App.

1. Login to Easypaisa App
2. Press “View All”
3. In “Payment” Section, select “Fee Collection”
4. Select “AIOU”
5. Enter “Challan Number”
6. Easypaisa App will show the payable amount & due date
7. Press “Pay Now”
8. Fee will be Paid and student will receive confirmation SMS from 3737
9. Student will write **Transaction ID** and **“Paid via Easypaisa App”** on the challan and admission form. Students are advised to keep the confirmation SMS save in phone until the receipt of intimation of admission confirmation from AIOU.

Through USSD String *786#

The Easypaisa mobile wallet account may be created by dialing *786#. For using this mode, student must have balance equal to his/her payable fee in Easypaisa mobile account. There are **no transactions charges**, if student use this mode to pay his/her fee. Following is the procedure of fee payment through USSD string *786#

1. Dial *786#
2. Select “4” (Payments)
3. Select “7” (Fee Collections)
4. Select “99” (Next)
5. Select “AIOU”
6. Enter Challan No.
7. Screen will show the payable amount & due date
8. Enter Mobile Account PIN

9. Fee will be Paid and student will receive confirmation SMS from 3737
10. Student will write **Transaction ID** and **“Paid via Easypaisa786 String”** on the challan and admission form. Further, students are advised to keep the confirmation SMS save in phone until the receipt of intimation of admission confirmation from AIOU.

Through Easypaisa Retailer (Agent) Shop/Telenor Franchise / Telenor Bank Branches

Fee can also be paid by visiting any Easypaisa Agent shop, Telenor franchise and Telenor Microfinance Bank branch. For using this mode, student has to pay **Rs.15 per transaction** in addition to the payable fee. Following is the fee payment procedure through this mode:

1. Student may visit any nearest Easypaisa Retailer (Agent) Shop, Telenor franchise or Telenor Microfinance Bank branch
2. Student will inform the retailer/franchisee/teller that he/she wish to pay fee of AIOU
3. Retailer/Franchisee/Teller will ask the student to share CNIC number, Mobile Number & Challan Number
4. Retailer/Franchisee/Teller will enter the Challan Number in his Easypaisa Tab/system
5. Tab/System will show the payable amount & due date
6. Student will hand-over the fee amount to retailer/franchisee/teller
7. Once the fee amount is handed over, the retailer/franchisee/teller will process the fee transaction

8. Fee will be paid and student will receive confirmation SMS from 3737 on mobile number. Transaction charges will be mentioned in the confirmation SMS
9. Student will write **Transaction ID** and **“Paid via Easypaisa Agent/Franchisee/Teller”** on the challan and admission form. Bank stamp will be embossed only in case the fee is paid through Telenor Microfinance Bank branches. Further students are advised to keep the confirmation SMS save in phone until the receipt of intimation of admission confirmation from AIOU.

Upaisa Through Upaisa App

The account may be created after downloading the Upaisa Mobile App from Playstore. For using this mode, student must have balance equal to his/her payable fee in Upaisa mobile account. There are **no transactions charges**, if student use this mode to pay his/her fee. Following is the procedure of fee payment through Upaisa App.

1. Login to Upaisa App
2. Please click on “Payments”
3. Click on “AIOU”
4. Enter “Challan Number”
5. Upaisa App will show the payable amount
6. Press “Pay Now”
7. Fee will be Paid and student will receive confirmation SMS
8. Student will write **Transaction ID** and **“Paid via Upaisa App”** on the challan and admission form. Students are advised to keep the confirmation SMS save in phone until the receipt of intimation of admission confirmation from AIOU.

Through USSD String *786#

The Upaisa mobile wallet account may be created by dialing *786#. For using this mode, student must have balance equal to his/her payable fee in Upaisa mobile account. There are **no transactions charges**, if student use this mode to pay his/her fee. Following is the procedure of fee payment through USSD string *786#

1. Dial *786#
2. Select “Payments”
3. Select “AIOU”
4. Enter Challan No.
5. Screen will show the payable amount
6. Student will enter his/her Mobile Number and PIN
7. Fee will be Paid & student will receive confirmation SMS
8. Student will write **Transaction ID** and “**Paid via Upaisa786 String**” on the challan and admission form. Students are advised to keep the confirmation SMS save in phone until the receipt of intimation of admission confirmation from AIOU

Through Upaisa Agent Shop/Ufone Franchise /PTCS OSS/U Microfinance Bank Branches

Fee can also be paid by visiting any Upaisa Agent shop, Ufone franchise, PTCL One stop shop (OSS) and U Microfinance Bank branch. For using this mode, student has to pay **Rs.15 per transaction** in addition to the payable fee. Following is the fee payment procedure through this mode.

1. Student may visit any nearest Upaisa Retailer (Agent) Shop, Ufone Franchise, PTCL OSS or U Microfinance Bank branch
2. Student will inform the retailer/franchisee/teller that he/she wish to pay fee of AIOU
3. Retailer/Franchisee/Teller will ask the student to share CNIC number, Mobile Number & Challan Number
4. Retailer/Franchisee/Teller will enter the Challan Number in his Upaisa Tab/system
5. Tab/System will show the payable amount & due date
6. Student will hand-over the fee amount to retailer/franchisee/ teller
7. Once the fee amount is handed over, the retailer/franchisee/teller will process the fee transaction
8. Fee will be paid and student will receive confirmation SMS on mobile number. Transaction charges will be mentioned in the confirmation SMS.
9. Student will write **Transaction ID** and “**Paid via Upaisa Agent/Franchisee/Teller**” on the challan and admission form. Bank stamp will be embossed only in case the fee is paid through U Microfinance Bank branches. Students are advised to keep the confirmation SMS save in phone until the receipt of intimation of admission confirmation from AIOU.

Jazz Cash (Through Jazzcash App)

The account may be created after downloading the Jazzcash Mobile App from Playstore. For using this mode, student must have balance equal to his/her payable fee in Jazzcash mobile account. There are **no transactions charges**, if student use this mode to pay his/her fee. Following is the procedure of fee payment through Jazzcash App.

1. Login to Jazzcash App
2. Please click on “Education Fee”
3. Select “Universities” from the Menu
4. Select “AIOU” from the Sub Menu
5. Enter “Challan Number”
6. Jazzcash App will show the payable amount and due date
7. Enter MPIN
8. Fee will be Paid & student will receive confirmation SMS
9. Student will write **Transaction ID** and “**Paid via Jazzcash App**” on the challan and admission form. Students are advised to keep the confirmation SMS save in phone until the receipt of intimation of admission confirmation from AIOU.

Through USSD String *786#

The Jazzcash mobile wallet account may be created by dialing *786#. For using this mode, student must have balance equal to his/her payable fee in Jazzcash mobile account. There are **no transactions charges**, if student use this mode to pay his/her fee. Following is the procedure of fee payment through

USSD string *786#

1. Dial *786#
2. Select “Payments”
3. Select “Education Payments”
4. Select “AIOU”
5. Enter Challan No.
6. Screen will show the payable amount
7. Enter MPIN
8. Fee will be Paid & student will receive confirmation SMS
9. Student will write **Transaction ID** and “**Paid via Jazzcash786 String**” on the challan and admission form.

Students are advised to keep the confirmation SMS save in phone until the receipt of intimation of admission confirmation from AIOU.

Through Jazzcash Agent Shop/Jazz Franchise /Mobilink Microfinance Bank Branches

Fee can also be paid by visiting any Jazzcash Agent shop, Jazz franchise and Mobilink Microfinance Bank branch. For using this mode, student has to pay **Rs.20 per transaction** in addition to the payable fee. Following is the fee payment procedure through this mode.

1. Student may visit any nearest Jazzcash Retailer (Agent) Shop, Jazz Franchise or Mobilink Microfinance Bank branch
2. Student will inform the retailer/franchisee/teller that he/she wish to pay fee of AIOU
3. Retailer/Franchisee/Teller will ask the student to share CNIC number, Mobile Number & Challan Number
4. Retailer/Franchisee/Teller will enter the Challan Number in his Jazzcash Tab/system
5. Tab/System will show the payable amount & due date
6. Student will hand-over the fee amount to retailer/franchisee/teller
7. Once the fee amount is handed over, the retailer/franchisee/teller will process the fee transaction
8. Fee will be paid and student will receive confirmation SMS on mobile number. Transaction charges will be mentioned in the confirmation SMS
9. Student will write **Transaction ID** and “**Paid via Jazzcash Agent/Franchisee/Teller**” on the challan and admission

form. Bank stamp will be embossed only in case the fee is paid through Mobilink Microfinance Bank branches. Students are advised to keep the confirmation SMS save in phone until the receipt of intimation of admission confirmation from AIOU.

REGULATIONS FOR REFUND OF ADMISSION FEE

- i. The Applicant/candidate/student who has submitted his/her fee for Admissions but does not wish to continue and applied for refund of fee before the start of his/her study period as per Academic Calendar available on the AIOU website corresponding to his/her respective semester i.e Autumn or Spring, the fees will be refunded after the deduction @ 10% of the total fee.
- ii. The Applicant/Candidate who was not eligible but deposited the fee for admission and applied for refund within one year from the date of fee deposit, the fee shall be refunded after deduction @15% of total fee.
- iii. The student who has deposited his/her fee in excess of due fee that total excess amount shall be refunded or adjusted as the case may be.
- iv. The Treasurer Department shall verify the fee of students and shall send the case to the Audit Department for pre-audit.
- v. The cheque will be issued to the candidate by the Campus Payment Section (CPS), Treasurer’s Department.
- vi. In the case of death, the full fee will be refunded through crossed cheque in favour of the Blood Relative of deceased student, after fulfilling all the codal formalities. The refund case must be submitted within one year of fee deposit.
- vii. In case the students who are not allowed/granted admission to a program offered by the University due to less

- viii. enrollment/non formation of viable group/non offering of courses, full fee will be refunded to them.
- viii. If the admission of an Applicant/Candidate is not matured due to any reason beyond the control of the
- ix. University or due to unforeseen issues, the whole paid fee, without any deductions shall be refunded to the respective applicant/candidate. The refund case must be submitted within one year of fee deposit.

DISABILITY COORDINATORS:

In compliance with Higher Education Commission (HEC) revised policy i.e., “Policy for students with disabilities at HEIs in Pakistan 2021”, the following Officers have been appointed as Disability Coordinators to facilitate the students with disabilities at AIOU.

Sr.#	Name of the Officer	Telephone Nos.
1.	Dr. Hira Ibrahim Medical Officer	051-9571110
2.	Mr. Umair Bin Nadeem, Assistant Director Press & Media, Directorate of Public Relations	051-9571372

IMPORTANT TELEPHONE NUMBERS

Sr.#	Name	Telephone Nos.
1.	Director Admissions	051-9250043 051-9250162 (Fax)
2.	Controller of Examinations	051-9250012
3.	Director Students Affairs	051-9250174
4.	Admission (Postgraduate)	051-9571547
Helpline: (051) 111 112 468		
Help Desk: support.aiou.edu.pk		

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2	Gilgit	Mr. Niamatullah, Regional Coordinator, Allama Iqbal Open University, SST, Govt. Boys High School Tehsil & District Astore	0315-7331152
3	Gilgit	Mr. Mahfuzullah, Regional Coordinator, Allama Iqbal Open University, Principal, Govt.Higher Secondary School, Tehsil Darel , District Diamir	0355-5355009
4	Gilgit	Mr. Ahmad Raza, Regional Coordinator, Allama Iqbal Open University, SST, Govt.Girls High School, Tehsil Chalt , District Nagar	0346-9239995
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6	Hyderabad	Mr. Rasheed Ahmad, Regional Coordinator, Allama Iqbal Open University, HST, Govt. Shah Abdul Latif High School Tando Adam Tehsil Tando Adam	0333-2881340
7	Hyderabad	Mr. Muhammad Mobin, Regional Coordinator, Allama Iqbal Open University, Head Master (R), House No.B546, Qaim Khani Mohallah, Ward No. 06, Jhudo Tehsil Jhudo	0331-3891884
8	Peshawar	Mr. Gohar Khan, Regional Coordinator, Allama Iqbal Open University,	0333-9330321

		Principal Govt. High School No. 02, Jamrud Tehsil Khyber	
9	Timergara	Mr. Khalil Ur Rehamn, Regional Coordinator, Allama Iqbal Open University, Headmaster (Rtd), Govt. High School, Dheri Kot Village & Post Office Kot Malakand Tehsil Dargai District Malakand	0334-9311036
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14	Rawalpindi	Dr. Muhammad Anwar, Regional Coordinator, Allama Iqbal Open University, Headmaster, Govt. High School, Bhabra Tehsil Wah Cantt District Rawalpindi.	0300-5363883

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