

BS

FACE TO FACE PROGRAMMES

FACULTY OF SCIENCES
FACULTY OF EDUCATION

AIOU

PROSPECTUS

2026

SPRING



Allama Iqbal Open University, Islamabad

www.aiou.edu.pk

Help Line: (051) 111-112-468

PROSPECTUS
OF
BS (Face to Face) Programmes
For
SEMESTER: Spring 2026



Allama Iqbal Open University, Islamabad

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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

AIOU ACADEMIC CALENDAR

IMPORTANT ACTIVITIES TO BE REMEMBERED

Spring Semester			Autumn Semester		
Proposed Activity	Schedule		Proposed Activity	Schedule	
	From	To		From	To
Admission	01- January	05- March	Admission	01- July	05- September
Test & Interview	06- March	30- March	Test & Interview	06- September	30- September
Study Period	01- April	30- July	Study Period	01- October	30- January
Examination (Conduct)	01-August	30- August	Examination (Conduct)	01- February	28- February
Result Declaration	15- September			15- September	

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.

**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	BS (4-Year)	4 years / 8 Semesters	6 Years
4	Postgraduate Diploma (1-Year)	1 Year / 2 Semesters	2 Years
5	Certificate (6-Months)	6 Months / 1 Semester	1 Years
6	BS 2.5 years	2.5 Years/5 Semester	4 Years
7	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** \implies **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 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, MCB, 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 (Programme Code 5048)

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

- 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
- To impart skills to carry out independent scientific and technical research in key areas of Biochemistry
- To equip students with laboratory procedures and techniques necessary to understand the life processes and enable them to serve in diagnostics and research labs
- 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 130 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 130)

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
PKST 3501	Pakistan Studies	2(2+0)	General
Total Credit		18	

Semester-3			
Code	Course Title	CH	
CHEM3501	Inorganic Chemistry	4(3+1)	General
BIO4508	Diversity of Plants	3(2+1)	Major
BIO4509	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
BIO4510	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

BIO5525	Human Physiology	3(2+1)	Major
BIO6525	Immunology	3(2+1)	Major
BIO5519	Biochemical Techniques	3(2+1)	Major
BIO5522	Microbial Genetics	3(2+1)	Interdisciplinary
TFSR3501	Fahm-e-Quran(Tajwid, Translation & Tafsir)	NC	
	Total Credits	18	
Semester 6			
Code	Course Title	CH	
BIO5530	Enzymology	3(2+1)	Major
BIO5531	Nutritional Biochemistry	3(2+1)	Major
BIO5526	Molecular Biology	3(2+1)	Major
BIO6521	Metabolism-1	3(3+0)	Major
BIO5532	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
BIO6524	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	Internship/ Field Experience	3(0+3)	Mandatory
BIO6528	Genetic Engineering	3(2+1)	Major
BIO6527	Epidemiology	3(2+1)	Interdisciplinary
Total Credits		12	
Total Credit Hours: Semester 5 – 8 =60 and Total CH: 70+60=130			

7. Fee Tariff for 1st Semester

Item	Rates
Registration Fee (Once at time of admission)	Rs.650/-
Admission Fee (Once at time of admission)	Rs.1300/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.800/-
Per 1 Credit course 2600	Rs. 46800/-
LAB CHARGES	Rs.3900/-
Total	Rs. 54950/-

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

1. Mode of Study

University will provide face to face teaching to the students. However online mode of teaching can be adopted, if required.

- i. **Medium of Instruction:** The Medium of Instructions for BS Biochemistry 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**
 - a) University will provide face to face teaching to the students.
 - b) The schedule of classes and dates of submission of assignments will be announced by the department.
- iv. **Assessment and Evaluation:** For each course the student progress will be assessed based on the followings:
 - a) **Continuous Assessment through written assignments/tests or Workshop or practical activities.**
 - i. For each course the marks obtained by each student in written assignments will constitute 2/3 of the continuous assessment. A student must obtain a minimum of 50% marks in assignments to pass this component.
 - ii. For each practical based course, the marks obtained in the practical workshop will constitute 1/3 part of the continuous assessment. A student must obtain a minimum of 50% marks in the practical workshop individually in order to pass this component.
 - b) **Final Examinations**

A written examination will be conducted for each course with 50% passing marks.

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

2. Guidelines for Online Application

- i. Visit AIOU Website: www.aiou.edu.pk
- ii. Click on OAS (Online Admission System) for Fresh Admission
- iii. Click 'Register' & fill details.
- iv. Upon successful registration please click on login
- v. After login click on Step-1 and complete your profile.

Note: All tabs should be filled before applying for admissions.

- vi. After completion of Step-1, click on Step-2 then click on "Download Challan" against programme (s) you wish to apply.
- vii. Pay the *admission form fee* as per AIOU prescribed criteria through selected bank branches or online payment methods.
- viii. After admission fee confirmation, you will be called on through SMS to visit the department for the verification of your credentials.
- ix. After the verification, you will be informed whether you are eligible for the admission in BS Programme (s) or not.

For Further Queries Contact

i. Coordinator BS-Biochemistry

Department of Biology

Research Complex, 1st Floor, AIOU, H-8, Islamabad

Tel: 051 9057293; Email: biology@aiou.edu.pk

BS BOTANY (Programme Code 5116)

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) (Programme Code 5116)

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 5511	Phycology & Bryology	3(3+0)	Major
	Total Credits	18	
Semester-2			
Code	Course Title	CH	
ENGL3504	Expository	3(3+0)	General

	Writing		
BIO3511	Mycology	3(2+1)	Major
PKST 3501	Pakistan Studies	2(2+0)	General
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	18	
Semester-3			
Code	Course Title	CH	
BIO 4511	Bacteriology & Virology	3(2+1)	Major
BIO4508	Diversity of Plants	3(2+1)	Major
BIO4512	Phytogeography	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	17	
Semester 4			

Code	Course Title	CH	
BIO 4513	Biodiversity & Conservation	4(2+1)	Major
BIO4514	Plant Pathology	3(2+1)	Major
BIO4510	Biotechnology	3(2+1)	Major
BIO 4515	Plant Systematics, Anatomy, & Development	3(2+1)	Major
BIO4507	Plant Physiology and Ecology	3(3+0)	Major
	Total Credits	15	
	Semester 5		
Code	Course Title	CH	
BIO5509	Diversity of Vascular Plants	3(2+1)	Major
BIO5510	Plant Anatomy	3(2+1)	Major
BIO3503	Plant Biochemistry	3(3+0)	Major
BIO5534	Principles of Genetics	3(3+0)	Major
ENVS 5510	Environmental Biology	3(2+1)	Interdisciplinary
TFSR3501	Fahm-e-Quran (Tajwid, Translation & Tafsir)		NC
	Total Credits	15	
	Semester 6		
Code	Course Title	CH	

BIO5512	Plant Ecology -I	3(2+1)	Major
BIO5513	Plant Physiology – I	3(2+1)	Major
BIO5526	Molecular Biology	3(3+1)	Major
BIO6513	Plant Systematics	3(2+1)	Major
BIO4505	Biosafety, Principles & Applications	3 (2+1)	Major
BIO5535	Plant Molecular Genetics	3(3+0)	Major
SERT 3501	Seerat -e- Tayyaba	NC	
	Total Credits	18	
	Semester-7		
Code	Course Title	CH	
BIO6508	Plant Ecology -II	3(2+1)	Major
BIO6509	Plant Physiology – II	3 (2+1)	Major
BIO6523	Bioinformatics	3 (2+1)	Interdisciplinary
BIO6524	Scientific Research and Report writing	3 (2+1)	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
BIO6528	Genetic Engineering	3 (2+1)	Major
BIO6512	Ethnobotany	3 (3+0)	Major
BIO 6532	Forensic Botany	3(2+1)	Major
	Total Credits	15	
Total Credit Hours: Semester 68+66=134			

3. Fee Tariff

Item	Rates
Registration Fee (Once at time of admission)	Rs.650/-
Admission Fee (Once at time of admission)	Rs.1300/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.800/-
Per 1 Credit course 2600 x18	Rs. 46800/-
LAB CHARGES	3900/-
Total	Rs. 54950/-

BS MICROBIOLOGY (Programme Code 5045)

1. 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.

2. 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.

3. Eligibility Criteria (BS Microbiology 4 years)

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

4. 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.

5. 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
BIO3510	Fundamentals of Microbiology	3(2+1)	Major
SOC3503	Civics and Community Engagement	2(2+0)	General
CS3503	Application of Information communication & Technologies (ICT)	3(2+1)	General
MATH4505	Quantitative Reasoning II	3(3+0)	General
SOC3506	Introduction to Sociology	2(2+0)	General
PKST3501	Pakistan Studies	2(2+0)	General
	Total Credits	18	
Semester-3			
Code	Course Title	CH	
CHEM3501	Inorganic Chemistry	4(3+1)	General
BIO4508	Diversity of Plants	3(2+1)	Major
BIO4509	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
BIO4510	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
BIO5522	Microbial Genetics	3(2+1)	Major
BIO5523	Virology	3(2+1)	Major
BIO5524	Soil Microbiology	3(2+1)	Major
BIO5525	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	
BIO5526	Molecular Biology	3(2+1)	Major
BIO5533	Antimicrobial and	3(2+1)	Major

	Antiviral Agents		
BIO5527	Food and Dairy Microbiology	3(2+1)	Major
BIO5528	Microbial Anatomy and Physiology	3(2+1)	Major
BIO5529	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
BIO6524	Scientific Research and Report writing	3(2+1)	Interdisciplinary
BIO6525	Immunology	3(2+1)	Major
BIO6526	Medical Microbiology	3(2+1)	Major
BIO6523	Bioinformatics	3(2+1)	Interdisciplinary
	Total credits	15	
Semester-8			
Code	Course title	CH	
BIO6527	Epidemiology	3(2+1)	Major
BIO6519	Capstone Project	3(0+3)	Mandatory
BIO6520	Field Experience/ Internship	3(0+3)	Mandatory
BIO6528	Genetic Engineering	3(2+1)	Major
	Total credits	12	
Total Credit Hours: Semester 130			

Fee Tariff

Item	Rates
Registration Fee (Once at time of admission)	Rs.650/-
Admission Fee (Once at time of admission)	Rs.1300/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.800/-
Per 1 Credit course 2600	Rs. 46800/-
LAB CHARGES	Rs.3900/-
Total	Rs. 54950/-

**BS MICROBIOLOGY (2 Years)
(Programme Code 5584)**

Semester 1			
Code	Course Title	CH	
BIO5518	Applied Environmental Microbiology	3(2+1)	Major
BIO5522	Microbial Genetics	3(2+1)	Major
BIO5523	Virology	3(2+1)	Major
BIO5524	Soil Microbiology	3(2+1)	Major
BIO5525	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 2			
Code	Course Title	CH	
BIO5526	Molecular Biology	3(2+1)	Major
BIO5533	Antimicrobial and Antiviral Agents	3(2+1)	Major
BIO5527	Food and Dairy Microbiology	3(2+1)	Major
BIO5528	Microbial Anatomy and Physiology	3(2+1)	Major
BIO5529	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
BIO6524	Scientific Research and Report writing	3(2+1)	Interdisciplinary
BIO6525	Immunology	3(2+1)	Major
BIO6526	Medical Microbiology	3(2+1)	Major
BIO6523	Bioinformatics	3(2+1)	Interdisciplinary
	Total credits	15	
Semester-4			
Code	Course title	CH	
BIO6527	Epidemiology	3(2+1)	Major
BIO6519	Capstone Project	3(0+3)	Mandatory
BIO6520	Field Experience/ Internship	3(0+3)	Mandatory
BIO6528	Genetic Engineering	3(2+1)	Major

	Total credits	12	
Total Credit Hours: Semester 130			

Fee Tariff

Item	Rates
Registration Fee (Once at time of admission)	Rs.650/-
Admission Fee (Once at time of admission)	Rs.1300/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.800/-
Per 1 Credit course 2600	Rs. 46800/-
LAB CHARGES	Rs.3900/-
Total	Rs. 54950/-

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 **Programme Code 5578**

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 AIU. 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 (BA/ BSc 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 relevant field with 50% marks who wish to switch to another discipline shall also be eligible for admission

Semester wise lay out for BS Environmental Science 2.5 years (B.Sc Based Programs) (Total CH# 86) (Programme Code 5578)

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 II			
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 III			
Course Code	Course Title	CH	
ENVS 5509	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 IV			
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 V			
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	

4. Fee Tariff

Item	Rates
Registration Fee (Once at time of admission)	Rs.650/-
Admission Fee (Once at time of admission)	Rs.1300/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.800/-
Per 1 Credit course 2600 x 18	Rs. 46800/-
LAB CHARGES	Rs.3300/-
Total	Rs. 54350/-

BS Environmental Science (AD Based) 2 years (Programme Code 5586)

Eligibility Criteria

Students having associate degree in relevant field with at least 60 credit hours with 50% marks.

- 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 I			
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 II			
Course Code	Course Title	CH	
ENVS 5509	Scientific Research and Report Writing	3 (2+1)	Major
ENVS 5505	Intro to	3	Major

	Environmental Economics	(3+0)	
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 III			
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 IV			
Course Code	Course Title	CH	
ENVS6509	Capstone Project	3 (0+3)	Major
ENVS6510	Disaster Risk	4	Major

	Reduction and Management	(3+1)	
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.650/-
Admission Fee (Once at time of admission)	Rs.1300/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.800/-
Per 1 Credit course 2600 x 18	Rs. 46800/-
LAB CHARGES	Rs.3300/-
Total	Rs. 54350/-

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.

4.3 Mode of Teaching

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

Assessment and Evaluation:

See page vi

ii. **Chairperson,**

Department of Environmental Science
Faculty of Sciences, Research Complex (First Floor)
Allama Iqbal Open University
Phone: 051 9057185

iii. **Dr. Samia Qadeer**

Program Coordinator (BS 4 Year)

Department of Environmental Science
Faculty of Sciences, Research Complex (First Floor)
Allama Iqbal Open University
Phone: 051-9057726 /051-9575674

Faculty Members

i. **Dr. Sofia Khalid,**

Associate Professor/Chairperson
Ph: 051 9057185

ii. **Dr. Zahid Ullah**

Assistant Professor
Ph. 051-9057735

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 (Programme Code 5110)

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 = 140

Title of Courses	Alphanumeric Course Code	CH	Category
Semester I			
Fundamentals of Chemistry	CHEM3512	3(2+1)	Major
Introductory Biochemistry	BIO3509	3(2+1)	General
Quantitative Reasoning-I	MATH3508	3(3+0)	General
Pakistani Adab-I	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		18	
Semester II			
Principles of Inorganic Chemistry	CHEM3513	3(2+1)	Major
Environmental Chemistry	CHEM3514	3(2+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
Understanding Of Hly Quran-I	TFSR 3502	1(0+1)	General
Credits		18	
Semester III			
Fuel Chemistry	CHEM4502	3(2+1)	Major
Principles of Organic Chemistry	CHEM4503	3(2+1)	Major
Principles of Polymer Chemistry	CHEM4504	3(2+1)	Major
Introduction to Nano-Chemistry	CHEM4505	3(2+1)	Major
Entrepreneurship	MGT3503	2(2+0)	General
Pakistan Studies	PKST 3501	2(2+0)	General
Understanding Of Hly Quran-I		1(0+1)	General
Credits		17	
Semester IV			
Forensic Chemistry	CHEM4506	3(2+1)	Major
Industrial Chemistry	CHEM4507	3(2+1)	Major
Pharmaceutical Chemistry	CHEM4508	3(2+1)	Major
Principles of Physical Chemistry	CHEM4509	3(2+1)	Major
Principal of Analytical Chemistry	CMEM 4510	3(2+1)	Major
Introduction to Sociology	SOC3506	2(2+0)	General
Credits		17	
Semester V			
Advanced Organic Chemistry	CHEM5506	3(2+1)	Major
Advanced Inorganic Chemistry	CHEM5507	3(2+1)	Major

Advanced Physical Chemistry	CHEM5508	3(3+0)	Major
Advanced Analytical Chemistry	CHEM5509	3(2+1)	Major
Computational Chemistry	CHEM5510	3(2+1)	Major
Statistics for Chemists	STAT3507	3(3+0)	Major
Credits		18	
Semester VI			
Chemistry Lab-I	CHEM3511	4(0+4)	Major
Elective-I		3(3+0)	Major
Elective-II		3(3+0)	Major
Soil Chemistry	CHEM5511	3(2+1)	Major
Basic of Environmental Science	ENV4501	3(2+1)	Interdisciplinary
Seerat-e-Tayyaba	SERT3501	NC	Compulsory
Credits		16	
Semester VII			
Chemical Safety and Risk Management	CHEM6533	3(3+0)	Major
Elective III		3(3+0)	Major
Elective-IV		3(3+0)	Major
Elective V		3(3+0)	Major
Scientific Research and Report Writing	BIO6524	3(2+1)	Interdisciplinary
Field Experience/Internship	CHEM6531	3(0+3)	Major
Credits		18	
Semester VIII			
Elective VI		3(3+0)	Major
Elective VII		3(3+0)	Major
Artificial Intelligence in chemistry	CHEM 6534	3(2+1)	Major
Quality Control and Assurance		3(3+0)	Interdisciplinary
Agricultural Chemistry	CHEM 6535	3(2+1)	Major
Capstone Project	CHEM6532	3(0+3)	Major
Credit		18	

List of Electives for Physical Chemistry

Sr	Title of Course	Course Code	Credit Hours	Category
1	Chemical Kinetics	CHEM 6511	3(3+0)	Major
2	Colloids & Surfactants		3(3+0)	Major
3	Electrochemistry	CHEM 6513	3(3+0)	Major
4	Molecular Spectroscopy	CHEM 6526	3(3+0)	Major
5	Quantum Chemistry	CHEM 6512	3(3+0)	Major
6	Surface Chemistry		3(3+0)	Major
7	Symmetry & Group Theory		3(3+0)	Major

List of Electives of Inorganic Chemistry

Sr	Title of Course	Course Code	Credit Hours	Category
1	Chemistry of Transition Metals		3(3+0)	Major
2	Coordination Chemistry	CHEM 6506	3(3+0)	Major
3	Group theory for Chemistry and its Applications	CHEM 6522	3(3+0)	Major
4	Inorganic Polymers		3(3+0)	Major
5	Lanthanide & Actinide Chemistry		3(3+0)	Major
6	Main Group Chemistry		3(3+0)	Major
7	Organometallics Chemistry	CHEM 6521	3(3+0)	Major

List of Electives for Organic Chemistry

Sr	Title of Course	Course Code	Credit Hours	Category
1	Green Organic Synthesis		3(3+0)	Major
2	Heterocyclic Chemistry	CHEM 6501	3(3+0)	Major
3	Chemistry of Natural Products	CHEM6516	3(3+0)	Major
4	Spectroscopic Methods in Organic Chemistry	CHEM 6503	3(3+0)	Major
5	Special Organic Reactions	CHEM6517	3(3+0)	Major
6	Stereochemistry of Organic Compounds	CHEM 6502	3(3+0)	Major
7	Organic Synthesis	CHEM 6518	3(3+0)	Major

3.4 Fee Tariff

Item	Fee
Registration Fee:	Rs.650/-
Admission Fee:	Rs.1300/-
Degree Fee (Once at time of admission) Technology Fee (per semester)	Rs. 1500 Rs.800/-
Course Code / Lab	Fee
Per 1 Credit Hour Course Fee 2600x 18	Rs 46800/-
Lab fee (per semester)	Rs.7800/-
First Semester Fee	Rs.58850/-

BS Chemistry (BSc Based) 2.5 years (Programme Code 5577)

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 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	CHEM3502	4(3+1)	Major

	Chemistry			
	Physical Chemistry	CHEM3503	4(3+1)	Major
	Pre-Calculus	MATH3501	3(3+0)	ID
	Credits		18	
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 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 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 and Report Writing	ENVS 5509	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 Wastewater Treatment	ENVS4506	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 and Report Writing	ENVS 5509	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	ENVS4506	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 and Report Writing	ENVS 5509	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	ENVS4506	3(2+1)	ID
	Credits		18	

4.4 Fee Tariff

Item	
Registration Fee:	Rs.650/-
Degree Fee (once at time of admission)	Rs. 1500/-
Admission Fee:	Rs.1300/-
Technology Fee (per semester)	Rs.800/-
Course Code / Lab	Fee
Per 1 Credit Course Fee 2600*18	Rs.46800/-
Lab fee (per semester)	Rs.7800/-
First Semester Fee	Rs.58850/-

BS Chemistry (AD Based) 2 years programme (Programme Code 5583)

Eligibility Criteria

Students with an Associate degree with 50% marks 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 Chemists	CHEM3510	2(2+0)	Major
	Chemistry Lab – I	CHEM3511	4(0+4)	Major
	Fahm-e-Quran	TFSR3501	NC	

	(Tajwid, Translation & Tafsir			
	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 and Report Writing	ENVS 5509	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	ENVS4506	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 and Report Writing	ENVS 5509	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	ENVS4506	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 and Report Writing	ENVS 5509	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	ENVS4506	3(2+1)	ID
	Credits		18	
Total Credit Hours: Semester 5 –84 = 64				

5.4 Fee Tariff

Item	
Registration Fee:	Rs.650/-
Degree Fee (once at time of admission)	Rs. 1500/-
Admission Fee:	Rs.1300/-
Technology Fee (per semester)	Rs.800/-
Course Code / Lab	Fee
Per 1 Credit Course Fee 2600*18	Rs.46800/-
Lab fee (per semester)	Rs.7800/-
First Semester Fee	Rs.58850/-

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

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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 (Programme Code 5050)

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.

1. 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.

2. 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 128 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) 2(2+0)	GE: Islamic Studies
3.		PKST3502	3(3+0)	GE: Ideology and Constitution of Pakistan
4.	Ideology and Constitution of Pakistan	STAT3501	2(2+0)	Interdisciplinary
5.	Introductory Statistics	URD3503	3(3+0)	GE: Arts and Humanities
6.	Pakistani Adab- I Calculus-I	MATH3502		Major
			15 Credit Hours	
Semester II				
1.	Expository Writing	ENGL3504	3(3+0)	GE: Expository English
2.	Civics and Community	SOC3503	2(2+0)	GE: Civics and Community
3.	Engagement	CS3503	3(2+1)	Engagement
4.	Application of Information	SOC3506	2(2+0)	GE: Applications of ICT
5.	Communication & Technologies	MATH3509	3(3+0)	GE: Social Sciences
6.	Introduction to Sociology	MATH3507	3(3+0)	Major
	Calculus-II	PKST3501	2(2+0)	Major
	Set Theory & Logic			
	Pakistan Studies			
			18 Credit Hours	
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	MATH3512	3(3+0)	GE: Natural Sciences
5.	Science	MATH4502	3(3+0)	Major
6.	Linear Algebra	MATH3505	3(3+0)	

	Analytical Geometry			Major
	Discrete Mathematics-I			Major
			17 Credit Hours	
Semester IV				
1.	Quantitative Reasoning-II	MATH4505	3(3+0)	GE: Quantitative Reasoning
2.	Introduction to Probability and Distributions	STAT3503	3(3+0)	Interdisciplinary
3.	Probability and Distributions	MATH4504	3(3+0)	Major
4.	Mathematical Methods	MATH4503	3(3+0)	Major
5.	Vector and Tensor Analysis	MATH3510	3(2+1)	Major
6.	Computer and Scientific Applications C++ Group Theory	MATH 5503	3(3+0)	Major
			18 Credit Hours	
Semester V				
1.	Real Analysis-I	MATH3513		
2.	Ordinary Differential Equations	MATH3514		
3.	Differential Geometry	MATH5501		
4.	Waves and Oscillations	PHY3509		
5.	Machine Learning	CS5501		
6.	Fahm-e-quran (Tajwid, translation and Tafsir)	TFSR3501		
			15 Credit Hours	
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	Mandatory Non-credit Course
			15 Credit Hours	
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)	Mandatory
			15 Credit Hours	
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 Credit Hours	

Total Credit Hours: = 128

Optional Course		
MATH 6508	Operation Research	3(3+0)
MATH 6509	Combination	3(3+0)
MATH 6510	Applied Number Theory	3(3+0)
MATH 6511	Galois Theory	3(3+0)
MATH 6512	Mathematical Statistics-II	3(3+0)
MATH 6513	Optimization	3(3+0)
MATH 6514	Analytical Dynamics	3(3+0)
MATH 6515	Mathematical Modeling	3(3+0)
MATH 6516	Graph Theory	3(3+0)

MATH 6517	Algebraic Topology	3(3+0)
MATH 6518	Research Report	3(3+0)
MATH 6519	Mathematical Finance-I	3(3+0)
MATH 6520	Theory of Racks and Quandles	3(3+0)
MATH 6521	Research Project	3(3+0)
MATH 6522	Mathematical Methods For Statistics	3(3+0)

▪ **Fee Tariff**

Item	
Registration Fee (Once at time of admission)	Rs.650/-
Admission Fee (Once at time of admission)	Rs.1300/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs.800/-
Per 1 Credit hours fee: Rs. 2600*15	Rs. 39000/-
Lab Fee (Per Semester)	Rs.1000/-
Total	Rs. 44250/-

**3. BS Mathematics (BA/ BSC Based) (2.5 Years)
(Programme Code 5580)**

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 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 Credit Hours

Semester V				
1.	Real Analysis-I	MATH3513	3(3+0)	Major
2.	Ordinary Differential Equations	MATH3514	3(3+0)	Major
3.	Differential Geometry	MATH5501	3(3+0)	Major
4.	Waves and Oscillations	PHY3509	3(3+0)	Interdisciplinary
5.	Machine Learning	CS5501	NC	Interdisciplinary
6.	Fahm-e-quran (Tajwid, translation and Tafsir)	TFSR3501		Mandatory Non-credit Course
15 Credit Hours				
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.	Theory Seerat-e-Tayyaba	SERT3501	NC 15	Mandatory Non-credit Course

15 Credit Hours				
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)	Mandatory
15 Credit Hours				
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 Credit Hours				

Optional Course		
MATH 6508	Operation Research	3(3+0)
MATH 6509	Combination	3(3+0)
MATH 6510	Applied Number Theory	3(3+0)
MATH 6511	Galois Theory	3(3+0)
MATH 6512	Mathematical Statistics-II	3(3+0)
MATH 6513	Optimization	3(3+0)
MATH 6514	Analytical Dynamics	3(3+0)
MATH 6515	Mathematical Modeling	3(3+0)
MATH 6516	Graph Theory	3(3+0)
MATH 6517	Algebraic Topology	3(3+0)
MATH 6518	Research Report	3(3+0)
MATH 6519	Mathematical Finance-I	3(3+0)
MATH 6520	Theory of Racks and Quandles	3(3+0)
MATH 6521	Research Project	3(3+0)
MATH 6522	Mathematical Methods For Statistics	3(3+0)

▪ **Fee Tariff**

Item	
Registration Fee (Once at time of admission)	Rs.650/-
Admission Fee (Once at time of admission)	Rs.1300/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs.800/-
Per 1 Credit hours fee: Rs.2600*18	Rs. 46800/-
Lab Fee (Per Semester)	Rs.1000/-
Total	Rs. 52050/-

4. BS Mathematics AD Based 2 years (Programme Code 5589)

Eligibility

Associate Degree in the relevant field with at least 60 credit hours.

Semester I				
1.	Real Analysis-I	MATH3513	3(3+0)	Major
2.	Ordinary Differential Equations	MATH3514	3(3+0)	Major
3.	Differential Geometry	MATH5501	3(3+0)	Major
4.	Waves and Oscillations	PHY3509	3(3+0)	Interdisciplinary
5.	Machine Learning	CS5501	3(3+0)	Interdisciplinary
6.	Fahme-Quran (Tajwid, translation and tafsir)	TFSR3501	NC	Mandatory Non-credit Course
15 Credit Hours				
Semester II				
Topology	MATH3511	3(3+0)	Major	
Complex Analysis	MATH5502	3(3+0)	Major	
Analytical Mechanics	MATH5504	3(3+0)	Major	
Real Analysis-II	MATH5505	3(3+0)	Major	
Applied Number Theory	MATH6510	3(3+0)	Major	
Seerat-e-Tayyaba	TFSR3501	NC	Mandatory Non-credit	
			15	Course
15 Credit Hours				

Semester III				
1.	Numerical Methods	MATH6501	3(2+1)	Major
2.	Partial Differential Equations	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)	Mandatory
15 Credit Hours				
Semester IV				
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 Credit Hours				
Optional Course				
MATH 6508	Operation Research		3(3+0)	
MATH 6509	Combination		3(3+0)	
MATH 6510	Applied Number Theory		3(3+0)	
MATH 6511	Galois Theory		3(3+0)	
MATH 6512	Mathematical Statistics-II		3(3+0)	
MATH 6513	Optimization		3(3+0)	
MATH 6514	Analytical Dynamics		3(3+0)	
MATH 6515	Mathematical Modeling		3(3+0)	
MATH 6516	Graph Theory		3(3+0)	
MATH 6517	Algebraic Topology		3(3+0)	
MATH 6518	Research Report		3(3+0)	
MATH 6519	Mathematical Finance-I		3(3+0)	
MATH 6520	Theory of Racks and Quandles		3(3+0)	
MATH 6521	Research Project		3(3+0)	
MATH 6522	Mathematical Methods For Statistics		3(3+0)	
Item				
Registration Fee (Once at time of admission)			Rs.650/-	

Admission Fee (Once at time of admission)	Rs.1300/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs.800/-
Per 1 Credit hours fee: Rs. 2600*15	Rs. 39000/-
Lab Fee (Per Semester)	Rs.1000/-
Total	Rs. 44,250/-

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 AIU.

Student progress will be assessed based on the followings:

Continuous Assessment

See page vi

Contact Details

For further information, contact:

i. Chairman

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ii. Coordinator BS-Mathematics

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9. Faculty Members

1. **Dr. Nasir Rehman**
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Chairman, Department of Mathematics
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2. **Dr. Zahid Iqbal**
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3. **Dr. Irfan Mustafa**
Assistant Professor
Ph. 051-9575723
4. **Dr. Muhammad Nazam**
Lecturer
Ph. 051-9575731
5. **Dr. Bismah Jamil**
Lecturer
Ph. 051-957 5732
6. **Dr. Muhammad Faisal Iqbal**
Lecturer
Ph. 051-9575746
7. **Mr. Rizwan Salim Badar**
Lecturer
Ph. 051-9575746
8. **Dr. Irfan Younas**
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 (Programme Code 5052)

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

SCHEME OF STUDIES BS PHYSICS

Revised Scheme of Studies			Category
Semester 1			
Code	Title	Cr.H.	
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/ HADH3501	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 Credit Hours	
Semester 2			
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 Pak. Studies	2(2+0)	GE
PKST 3501		2(2+0)	GE
Total		19 Credit Hours	

Semester 3			
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 Credit Hours	
Semester 4			
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 Credit Hours	
Semester 5			
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 Credit Hours	
Semester 6			
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 Credit Hours	
Semester 7			
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 Credit Hours	
Semester 8			
PHY6516	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 Credit Hours	

Item	
Registration Fee (Once at time of admission)	Rs.650/-
Admission Fee (Once at time of admission)	Rs.1300/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs.800/-
Tuition Fee (Rs. 2600/- per credit hour)*19	Rs.49400/-
Total	Rs.53650/-

4. BS Physics (BSc Based) (Total Credit Hours 83) (Programme Code 5581)

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) with 45% marks 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 (BSc- Based)

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 Credit Hours	
Semester 1			
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 Credit Hours	
Semester 2			
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 Credit Hours	
Semester 3			
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 Credit Hours	
Semester 4			
PHY6516	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 Credit Hours	

4.4. Fee Tariff for 1st Semester Total Credit Hours 138

Item	
Registration Fee (Once at time of admission)	Rs.650/-
Admission Fee (Once at time of admission)	Rs.1300/-

Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs.800/-
Tuition Fee (Rs. 2600/- per credit hour) *19	Rs.49400/-
Total	Rs.53650/-

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

5. BS Physics (AD Based) (Programme Code 5590)

5.1. Eligibility Criteria

1. Students with Associate degree in the relevant field with at least 60 credit hours shall be eligible for admission. With 50% marks.

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)

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

4. TOTAL CREDIT HOURS 64

	Semester 1		
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 Credit Hours	

Semester 2			
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 Credit Hours	
Semester 3			
PHY6503	Solid State Physics-I	MAJOR	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
TFSR3501	Fahm-e-Quran (Tajwid, translation and Tafsir)	NC	
	Total	15 Credit Hours	
Semester 4			
PHY6516	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 Credit Hours	

Total Credit Hours = 64

5.4. Fee Tariff for 1st Semester

Item	
Registration Fee (Once at time of admission)	Rs.650/-
Admission Fee (Once at time of admission)	Rs.1300/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs.800/-
Tuition Fee (Rs. 2600/- per credit hour)*17	Rs.44200/-
Total	Rs. 48450/-

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.
- 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
(Programme Code 5069)**

Degree Title: BS Physics
 Transcript: BS Physics (Minor in DATA Science)
 Duration: 4 Years (8 Semester) 150 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)			
Code	Title	Cr.H.	Category
Semester 1			
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/ HADH3501	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 Credit Hours	
Semester 2			
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 Pak. Studies	2(2+0)	GE
PKST 3501		2(2+0)	GE
Total		19 Credit Hours	
Semester 3			
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 Credit Hours	
Semester 4			
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	3(3+0)	ID

	Probability & Probability Distribution		
PHY4508	Laboratory for Geometrical Optics and Spectroscopy	2(0+2)	MAJOR
PHY3506	Optics	3(3+0)	MAJOR
Total		17 Credit Hours	
Semester 5			
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
CS 5520	Introduction to DATA Science	3(3+0)	Minor
Total		20 Credit Hours	
Semester 6			
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

CS 5501	Machine Learning	3(2+1)	Minor
Total		20 Credit Hours	
Semester 7			
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
CS 6513	Artificial Neural Networks and Deep Learning	3(2+1)	Minor
TFSR3501	Fahm-e-Quran (Tajwid, translation and Tafsir)	NC	
Total		18 Credit Hours	
Semester 8			
PHY6516	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
CS 6514	Data Visualization	3(2+1)	Minor
SERT3501	Secrat-e-Tayyaba	NC	
Total		18 Credit Hours	

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

Item	
Registration Fee (Once at time of admission)	Rs.650/-
Admission Fee (Once at time of admission)	Rs.1300/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.800/-
Tuition Fee (Rs. 2600/- per credit hour)*19	Rs.49400/-
Total	Rs.53650/-

7 Contact Details

Chairperson

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BS Program Coordinator

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8 Faculty Members

1. Dr. Syed Raza Ali Raza

Associate Professor / Chairman
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2. Dr. Surayya Mukhtar

Assistant Professor
Ph: 051-9575423

3. Mr. Ather Hassan

Assistant Professor

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4. Dr. Muhammad Tariq Jan

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5. Dr. Abdul Jalil

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6. Dr. Zulfiqar Ali Shah

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7. Ms. Hareem Mufti

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8. Dr. Uzma Nosheen

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9. Dr. Tayyaba Aftab

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DEPARTMENT OF STATISTICS

BS STATISTICS (Data Science) (Program Code 5112)

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) (Programme Code 5112)

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 128 credit hours consisting of 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)

Semester I

Course Title	Code		CH
1. Functional English	ENGL3505	GE	3(3+0)
2. Quantitative Reasoning-I	MATH3508	GE	3(3+0)
3. Islamic Studies/Ethics	ITHC3501/HADH3501	GE	2(2+0)
4. Introductory Statistics	STAT3501	Major	3(3+0)
5. Essential		Maor	3(3+0)

Mathematics for Beginners	STAT 3510		
6. Pakistani Adab-I	URD3501	GE	2(2+0)
7. Seerat -e-Tayyab	SERT3501	GE	2(2+0)

Total Credit 16

Semester-2

1. Expository Writing	ENGL3504	Gen. Edu.	3(3+0)
2. Civic and community Engagement	SOC3503	Gen. Edu.	2(2+0)
3. Calculus-II	MATH3502	IDS	3(3+0)
4. Introduction to Probability & Probability Distributions	STAT 3508	Major	3(3+0)
5. Application of Information Communication & Technologies	CS3503	Gen. Edu.	3(2+1)
6. Ideology and Constitution of Pakistan	PKST3502	Gen. Edu.	2(2+0)
7 Fahm-e-Quran (Tajwid, Translation and Tafsir)-I	TFSR3502	Gen. Edu.	1(0+1)

Total Credit 17

Semester-3

1	Basic Statistical Inference	STAT4501	Gen.edu.	3(3+0)
2	Sampling and Sampling Distributions	STAT3507	Major	3(3+0)

3	Introduction to Regression Analysis and Experimental Designs	STAT3502	Major	3(3+0)
4	Calculus-II	MATH3509	IDS	3(3+0)
5	Pakistan Studies	PKST3501	GE	2(2+0)
6	Fahm-e-Quran (Tajwid, Translation And Tafsir)-II	TFSR4501	GE	1(0+1)
7	Entrepreneurship	MGT3503	GE	2(2+0)

Total Credit 17

Semester-4

1	Data Wrangling	STAT4510	Major	3(2+1)
2	Data Analysis and Statistical Packages	STAT6508	Major	3(2+1)
3	Non-Parametric Methods	STAT5505	Major	3(3+0)
4	Regression Analysis	STAT5507	Major	3(3+0)
5	Basics of Environmental science	ENVS4501	GE/NS	3(2+1)
6	Quantitative Reasoning-II	MATH4505	GE	3(3+0)

Credit Hours 18

Semester-5

1	Mathematical Methods	MATH4504	IDS	3(3+0)
2	Biostatistics	STAT6513	Major	3(3+0)
3	Sampling Techniques	STAT5511	Major	3(3+0)
4	Design and Analysis of Experiments	STAT5512	Major	3(3+0)
5	Probability Distributions	STAT5513	Major	3(3+0)

Credit Hours 18

Semester-6

1	Linear Algebra	MATH3512	IDS	3(3+0)
2	Statistical Inference	STAT5514	Major	3(3+0)
3	Elective I		Major	3(3+0)
4	Electives II		Major	3(3+0)
5	Internship	STAT6514	FE	3(3+0)

Credit Hours 15

Semester-7

1	Statistical Programming using R and python	STAT6516	Major	3(2+1)
2	Total Quality Management	STAT6503	Major	3(3+0)
3	Elective III		Major	3(3+0)
4	Electives IV		Major	3(3+0)
5	Capstone Project	STAT6515	Project	3(0+3)

Credit Hours 15

Semester-8

1	Applied Multivariate Analysis	STAT6506	Major	3(3+0)
2	Research Methodology	STAT6506	Major	3(3+0)
3	Elective V		Major	3(3+0)
4	Electives VI		Major	3(3+0)
5	Elective VII		Major	3(3+0)

Credit Hours 15

(I) List of Elective Course for BS Statistics (Data Science) Program

1	Statistical Tools for Data Science	STAT6517		3(2+1)
2	Statistics for Deep Learning	STAT6518		3(2+1)
3	Statistical Methods for Data mining	STAT6519		3(2+1)
4	Statistical Machine	STAT6520		3(2+1)

	learning		
5	Statistical Artificial Intelligence	STAT6521	3(2+1)
6	Big Data Analytics	STAT6537	3(2+1)
7	Digital Analytics	STAT6536	3(2+1)
8	High Dimensional Data Analysis	STAT6522	3(2+1)

Summary of Program

Total Credit Hours:	128
Minimum Duration:	8 Semester (4 Years)
Maximum Duration:	12 Semester (6 Years)

Eligibility Criteria

Higher secondary school certificate (involving 12 years of schooling) or an IBCC equivalent qualification in any group of studies is the minimum eligibility requirement for admission to the Bachelor of Science in Statistics.

Admission Procedure

The Eligible candidates will be selected for admission to the program through online process as per university policy.

Fee Tariff for 1st semester

Item	
Registration Fee:	Rs.650/-
Admission Fee:	Rs.1300/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee (per semester):	Rs.800/-
Course Code + Lab Fee	Fee
Per 1 Credit Hour Course Fee 2600*15	Rs.41600/-
Lab fee (per semester)	Rs.1000/-
Total Semester Fee	Rs.46850/-

BS STATISTICS

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

Eligibility Criteria for BS Programs (Programme Code 5579)

(BSc/BA 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 who wish to switch to another discipline shall also be eligible for admission.

TOTAL CREDIT HOURS 78

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

Course Title	Code	CH
Semester V		
1. Sampling techniques I	STAT5502	3(3+0)
2. Design and Analysis of Experiments-I	STAT5503	3(3+0)
3. Probability & Probability Distributions-I	STAT5504	3(3+0)
4. Mathematical Methods	MATH4504	3(3+0)
5. Fahm-e-Quran (Tajwid, translation and Tafsir)	TFSR3501	NC
6. Computer and Scientific Application	MATH3510	3(2+1)
		15 Credit Hours

Semester VI		
1. Data analysis and Statistical Packages	STAT5510	3(0+3)
2. Probability & Probability Distributions-II	STAT5506 STAT5507 STAT5508	3(3+0) 3(3+0) 3(3+0)
3. Regression Analysis	SERT3501 STAT5509	NC 3(3+0)
4. Sampling Techniques-II		
5. Seerat -E-Tayyab		
6. Design and Analysis of Experiments-II		
		15 Credit Hours
Semester VII		
1. Statistical Inference- Estimation	STAT6501 STAT6502	3(3+0) 3(3+0)
2. Econometrics		3(3+0)
3. Elective – I		3(3+0)
4. Elective-II Field Experience	STAT6514	3(0+3)

Internship		15 Credit Hours
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Semester VIII		
1. Statistical Inference- Testing of Hypothesis	STAT6505	3(3+0)
2. Elective-III		3(3+0)
3. Elective-IV		3(3+0)
4. Capstone Project	STAT6515	3(0+3)
5. Operation research	STAT6507	3(3+0)
15 Credit Hours		

Elective Courses			
1	Reliability	STAT 6510	3(3+0)
2	Date Mining	STAT 6511	3(3+0)
3	Bayesian Statistic	STAT 6512	3(3+0)
4	Research Methodology	STAT 6509	3(3+0)
5	Total Quality Management	STAT 6503	3(3+0)
6	Applied Multivariate Analysis	STAT 6506	3(3+0)

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

3.4 Fee Tariff for 1st semester

Item	
Registration Fee:	Rs.650/-
Admission Fee:	Rs.1300/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee (per semester):	Rs.800/-
Course Code + Lab Fee	Fee
Per 1 Credit Hour Course Fee 2600*18	Rs.46800/-
Lab fee (per semester)	Rs.1000/-
Total Semester Fee	Rs.52050/-

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

Scheme of Studies BS Statistics (AD Based) 60 (Credit Hours) (Programme Code 5588)

Eligibility Criteria: Associate degree in the relevant field with at least 60 Credit Hours. With 50% marks.

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

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

Elective Courses			
1	Reliability Analysis	STAT 6510	3(3+0)
2	Date Mining	STAT 6511	3(3+0)
3	Bayesian Statistic	STAT 6512	3(3+0)
4	Research Methodology	STAT 6509	3(3+0)
5	Total Quality Management	STAT 6503	3(3+0)
6	Applied Multivariate Analysis	STAT 6506	3(3+0)

Fee Tariff for 1st semester

Item	
Registration Fee:	Rs.650/-
Admission Fee:	Rs.1300/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee (per semester):	Rs.800/-
Course Code + Lab Fee	Fee
Per 1 Credit Hour Course Fee 2600*15	Rs.39000/-
Lab fee (per semester)	Rs.1000/-
Total Semester Fee	Rs.44250/-

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

Chairman office

Chairman,
Department of Statistics,
Lower Ground Floor, Science Block, Sector H-8, AIOU
Islamabad
Ph. No. 051-9057266, 9250062 Email:
statistics@aiou.edu.pk

BS Program Coordinator

Dr. Muhammad Yameen Danish
Assistant Professor
Ph: 051-9575631
Email: yameen.danish@aiou.edu.pk

9. Faculty Members

- 1. Prof. Dr. Irshad Ahmad Arshad**
Chairman /Dean
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- 2. Dr. Zahid Iqbal**

Associate Professor

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3. Dr. Muhammad Yameen Danish

Assistant Professor

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4. Mr. Mustansar Aaitazaz Amjad

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5. Mr. Sajid Hassan Shah

Research Associate

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6. Ms. Lubna Naz

Research Assistant

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Email: lubna.naz@aiou.edu.pk

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
(Programme Code 5053)**

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 138 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 3502	APPROVED	3(3-0) Major
2	Functional English	ENGL 3505	NEW	3(3-0) General
3	Islamic studies/ Ethics	ITHC3501 HADH3501	NEW	2(2-0) General
4	Ideology and constitution of Pakistan	PKST 3502		2(2-0) General

5	Quantitative reasoning	MATH 3508	NEW	3(3-0) General
6	Pakistan Adab-1	URD 3503	NEW	2(2-0) General
7	Biostatistics	STAT 3506	APPROVED	3(3-0) Interdisciplinary
			Credit Hours	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	CS3503	NEW	3(2-1) General
5	Civic and community engagement	SOC3503	NEW	2(2-0) General
6	Introduction to Sociology	SOC3506	NEW	2(2-0) General
7	Pak. Studies	PKST 3501		2(2-0)
			Credit Hours	18
3rd Semester		Course Code	Course Contents	
1	Macronutrients in Human	EDHN 4501	APPROVED	3(3-0) Major

	Nutrition			
2	Dietetics-I	EDHN 4502	APPROVED	3(2-1) Major
3	Entrepreneurship	MGT 3503	NEW	2(2-0) General
4	Essentials of Food Science & Technology	EDHN 4503	APPROVED	3(2-1) Major
5	Basics of Environmental Sciences	ENVS 4501	APPROVED	3(2-1) Major
6	Food Toxins & Allergens	EDHN 4504	APPROVED	3(3-0) Major
			Credit Hours	17
4th semester		Course Code	Course Contents	
1	Food and Dairy Microbiology	BIO5527	APPROVED	3(2-1) Interdisciplinary
2	Dietetics-II	EDHN 4505	APPROVED	3(2-1) Major
3	Nutrition Through the Life Cycle	EDHN 4506	APPROVED	3(3-0) Major
4	Assessment of Nutritional Status	EDHN 4507	APPROVED	3(2-1) Major
5	Food Analysis	EDHN 4508	APPROVED	3(2-1) Major
6	Micronutrients in Human Nutrition	EDHN 4509	APPROVED	3(3-0) Major
			Credit Hours	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-Quran (tajwid, translation and tafseer)	TFSR 3501	NEW	Non-credit course
			Credit Hours	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	EDHN 5511	APPROVED	3(2-1) Major

	Feeding			
6	Meal Planning and Management	EDHN 5512	APPROVED	3(2-1) Major
7	Seerat-e-Tayyaba	SERT 3501	NEW	Non-credit course
			Credit Hours	17
7th semester		Course Code	Course Contents	
1	Nutritional Biochemistry	BIO5531	APPROVED	3(2-1) Interdisciplinary
2	Global Food Issues	EDHN 6501	APPROVED	3(3-0) Major
3	General Pathology	EDHN 6502	APPROVED	3(3-0) Major
4	Nutritional Practices in Clinical Care	EDHN 6503	APPROVED	3(2-1) Major
5	Epidemiology	BIO6527	APPROVED	3(2-1) Interdisciplinary
6	Internship	EDHN6504		3(0-3)
			Credit Hours	18
8th semester		Course Code	Course Contents	
1	Research Methods	EDHN 6505	APPROVED	3(3-0) Major
2	Nutrition Through Social	EDHN 6506	APPROVED	3(3-0) Major

	Protection			
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)
			Credit Hours	15

Total credit hours: 138

Fee Tariff for First semester

Items	Rates
Registration fee (once at time of admission)	Rs. 650/-
Admission fee (once at time of admission)	Rs. 1300/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology fee	Rs. 800/-
Per credit hour fee: Rs 2600*18	Rs. 46800/-
Lab charges	Rs. 3900/-
Total	Rs. 54950/-

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

- a) University will provide face to face teaching to the students.
- b) 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:

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 (Programme Code 5117)

Program Features:

1. The updated BSCS with specialization is a 130 credit hours program and may be completed in minimum four years (eight semesters).
2. Two semesters are offered in a year, Spring and Autumn.
3. The duration of each semester is 18 weeks.
4. The program is in-line with HEC.

Mode of Teaching:

The program is offered in Face-to-Face Mode.

Merit/non-merit:

The BSCS with Specialization program is a non-merit-based program.

Assessment Criteria:**For Theory Courses:**

Continuous (Pass percentage is 50%)		Final (Pass percentage is 50%)
Assignment	Midterm	
20%	30%	50%

For Lab Courses:

Continuous (Pass percentage is 50%)			Final (Pass percentage is 50%)
Assignment	Midterm	Lab Practical	
20%	15%	15%	50%

The 70% percent attendance is mandatory in each course.

Eligibility:

Minimum 50% marks in Intermediate/12 years schooling/A- Level (HSSC) or Equivalent with Mathematics are required for admission in BSCS with Specialization. An equivalence 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 (non-credit) in the first two semesters.

SEMESTER I

Sr.	C. Code	Course Name	Credit Hours	Domain
1	CS3504	Computer Programming	4(3+1)	Core
2	CS3503	Applications of Information & Communication Technologies	3(2+1)	GER
3	MATH3516	Discrete Mathematics	3(3+0)	GER
4	ENGL3505	Functional English	3(3+0)	GER
5	MATH3502	Calculus-I (IDS I)	3(3+0)	
6	MGT3003	Introduction to Management	2 (2+0)	GER
	MATH3517	Pre-Calculus-I	Non Credit	
	Total Credits	18 (16+2)		

SEMESTER 2

Sr.	C. Code	Course Name	Credit Hours	Domain
1	CS3506	Object Oriented Programming	4(3+1)	Core
2	MATH3512	Linear Algebra (IDS II)	3(3+0)	
3	CS3508	Digital Logic	4(3+1) *	Core

		Design		
4	MATH3509	Calculus-II	3(3+0)	GER
5	MATH3518	Pre-Calculus-II	Non credit	
6	URD3503	Pakistani Adab-1	2(2+0)	GER
7	TFSR 3502	Fehm e Quran I	1(1+0)	GER
8	PKST3501	Pakistan Studies	2(2+0)	GER
	Total Credits	19(17+2)		

SEMESTER 3

Sr.	C. Code	Course Name	Credit Hours	Domain
1	CS4521	Data Structures and Algorithms	4(3+1)	Core
2	CS4523	Artificial Intelligence	3(2+1)	Core
3	CS4524	Computer Networks	3(2+1)	Core
4	CS4525	Software Engineering	3(3+0)	Core
5	SOC3503	Civics and Community Engagement	2 (2+0)	GER
6	TFSR 4501	Fehm e Quran II	1(1+0)	GER
7	ENVS4501	Basics of Environmental Science	3(2+1)	GER
	Total Credits		19(15+4)	

SEMESTER 4

Sr.	C. Code	Course Name	Credit Hours	

1		Computer Organization & Architecture	4(3+1) new	Core
2	ITHD3501/HADH3501	Islamic Studies/Ethics	2 (2+0)	GER
3	CS4527	Theory of Automata	3 (3+0)	Core
4	PKST3502	Ideology and Constitution of Pakistan	2 (2+0)	GER
5	ENGL3504	Expository Writing	3(3+0)	GER
6	MGT3503	Entrepreneurship	2 (2+0)	GER
7	CS5502	Operating Systems	3(2+1)	Core
	Total Credits		19(16+2)	

SEMESTER 5

Sr.	C. Code	Course Name	Credit Hours	Domain
1	CS3507	Database Systems	4 (3+1)	
2		Domain Elective 1	3(2+1)	
3	PHY4509	Applied Physics (IDS III)	3(2+1)	
4	STAT4509	Statistics and Probability (IDS IV)	3(3+0)	
5	CS6507	Internship/Field Experience	3 (0+3)	
	Total Credits:		16(13+3)	

SEMESTER 6

Sr.	C. Code	Course Name	Credit Hours	Domain
1	CS4522	Information Security	3(2+1)	Core
2		Domain Elective 2	3 (2+1)	Elective
3		Domain Elective 3	3 (2+1)	Elective
4		Domain Elective 4	3 (2+1)	Elective
5	SERT3501	Seerat-e-Tayyaba	Non Credit	
			12(8+4)	

SEMESTER 7

Sr.	C. Code	Course Name	Credit Hours	Domain
1	CS5515	Cloud Computing	3(2+1)	Core
2		Domain Elective 5	3(2+1)	Elective
3		Domain Elective 6	3(2+1)	Elective
4		Mobile Application Development	3(2+1)	Core
5	CS6501	Final Year Project – I	2 (0+2)	
	Total Credits:		14(8+6)	

SEMESTER 8

Sr.	C. Code	Course Name	Credit Hours	Domain
1	CS6504	Final Year Project – II	4(0+4)	
2	CS6502	Analysis and Design of Algorithm	3 (3+0)	Core
3		Domain Elective 7	3 (2+1)	Elective
4		Domain Elective 8	3 (2+1)	Elective
	Total Credits:	13 (7+6)		

**Specializations:
Software Engineering**

HEC Courses	Credit Hours	C. Code	Remarks
1. Software Requirement Engineering	3+0	CS5529	2+1 in our scheme
2. Software Project Management	3+0	CS6524	2+1 in our scheme
3. Software Quality and Testing	2+1	CS5513	2+1 S/W Testing & Quality Assurance
4. DevOps Principles and Practices	2+1/3+0		
5. Software Re-Engineering	2+1/3+0		
6. Software Design and Architecture	3+0	CS4522	2+1
7. Parallel and	2+1/3+0	CS5506	2+1

Distributed Computing			
8. Software Construction and Development	2+1/3+0	CS5521	2+1
9. Human Computer Interaction	2+1/3+0	CS6512	2+1 HCI
10. Formal Methods and Design	3+0		
11. Cross-platform Application Development	3+0		
12. Advanced Topics in Software Engineering	2+1/3+0		
13. Machine Learning	2+1	CS5501	2+1 Machine Learning
14. Internet of Things and Its Applications	2+1		
15. Green Software Engineering	3+0		

Data Science

1. Introduction to Data Science	3+0	CS4538	2+1
2. Computational Statistics	3+0		
3. Data Engineering	3+0		
4. Data Visualization	3+0	CS6514	2+1
5. Business Intelligence	3+0		
6. Tools and Techniques in Data Science	3+0		

7. Big Data Analytics	3+0	CS5521	2+1
8. Machine Learning	3+0	CS5501	2+1 Machine Learning CS5501
9. Deep Learning	3+0		ANN & DL, 2+1 in our scheme
10. Natural Language Processing	3+0	CS6521	2+1 NLP
11. Data Ethics & Security	3+0		
12. Computer Vision	3+0	CS6516	CV 2+1
13. Information Retrieval	3+0		
14. Generative AI	3+0		
15. Data Mining	3+0	CS4516	2+1 Data mining

Artificial Intelligence

HEC Courses	Credit Hours		Remarks
1. Programming for AI	3+0	CS4540	2+1 in our scheme
2. Machine Learning	3+0	CS5501	2+1 in our scheme
3. Deep Learning	3+0	CS6513	ANN & DL, 2+1 in our scheme
4. Knowledge representation and Reasoning	3+0	CS6522	2+1 in our scheme
5. Generative AI	3+0		
6. Computer Vision	3+0	CS6516	2+1 in our scheme
7. Natural Language Processing	3+0	CS6521	2+1 in our scheme

8. Data Mining	3+0	CS4516	2+1 in our scheme
9. Reinforcement Learning	3+0	CS6519	2+1 in our scheme
10. Optimization Techniques	3+0		
11. Stochastic Processes	3+0		
12. Machine learning Operations (MLOps)	3+0		
13. Agentic AI	3+0		
14. Speech Processing	3+0		
15. Evolutionary Computing & Swarm Intelligence	3+0		

Cyber Security

1. Information Assurance	3+0	CS4541	(2+1)
2. Network Security	2+1	CS6509	2+1
3. Secure Software Design and Development	2+1	CS5523	2+1
4. Digital Forensics and Incident Response	2+1	CS5525	2+1
5. Applied Cryptography	2+1		NEW course 2+1
6. Vulnerability Assessment and Penetration Testing	2+1		
7. Ethics in Cyber Security	2+1		
8. Cloud Security	2+1		New course 2+1
9. Embedded Systems Security	2+1		

10. Cyber Threat Intelligence	2+1		New course 2+1
11. Artificial intelligence for Cyber Security	2+1		
12. IoT Security	2+1		
13. Open-Source Intelligence Techniques	2+1		
14. Usable Security and Privacy	2+1		
15. Malware Analysis and Reverse Engineering	2+1		
16. Security Orchestration and Response	Automation 2+1		
17. Cyber Security Policy and Governance	3+0		
18. Security Analytics and DevSecOps	2+1		
19. Quantum Security	2+1		
20. Blockchain and Web 3 Security	2+1		
21. Wireless and Mobile Security	2+1	CS5527	OK 2+1

Information Technology

Course Name	Credit Hours		Remarks
1. Web Technologies	2+1	CS5507	
2. Cyber Security	2+1	CS5512	
3. Database Administration & Management	2+1	CS5518	
4. System &	2+1	CS5519	

Network Administration			
5. Information Technology Infrastructure	2+1	CS6508	
6. Network Security	2+1	CS6509	
7. Data Communication	2+1	3413	
8. Wireless and Mobile Networks	2+1		
9. Cloud Infrastructure and Services	2+1	New	
10. Email Systems and Server Management	2+1		
11. Ethical Hacking and Penetration Testing	2+1		
12. Security Policies and Compliance	3+0		
13. IT Project Management	3+0		
14. Systems Analysis and Design	3+0		
15. Technology Lifecycle Planning	3+0		

**BS Computer Science (WDC)
(Programme Code 5118)**

Program Features:

1. The updated BSCS with specialization is a 130 credit hours program and may be completed in minimum four years (eight semesters).
2. Two semesters are offered in a year, Spring and Autumn.
3. The duration of each semester is 18 weeks.
4. The program is in-line with HEC.

Mode of Teaching:

The program is offered in Face-to-Face Mode.

Merit/non-merit:

The BSCS with Specialization program is a non-merit-based program.

Assessment Criteria:

For Theory Courses:

Continuous (Pass percentage is 50%)		Final (Pass percentage is 50%)
Assignment	Midterm	
20%	30%	50%

For Lab Courses:

Continuous (Pass percentage is 50%)			Final (Pass percentage is 50%)
Assignment	Midterm	Lab Practical	
20%	15%	15%	50%

The 70% percent attendance is mandatory in each course.

Eligibility:

Minimum 50% marks in Intermediate/12 years schooling/A- Level (HSSC) or Equivalent with Mathematics are required for admission in BSCS with Specialization. An equivalence 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 (non-credit) in the first two semesters.

SEMESTER I

Sr.	C. Code	Course Name	Credit Hours	Domain
1	CS3504	Computer Programming	4(3+1)	Core
2	CS3503	Applications of Information & Communication Technologies	3(2+1)	GER
3	MATH3516	Discrete Mathematics	3(3+0)	GER

4	ENGL3505	Functional English	3(3+0)	GER
5	MATH3502	Calculus-I (IDS I)	3(3+0)	
6	MGT3003	Introduction to Management	2 (2+0)	GER
	MATH3517	Pre-Calculus-I	Non Credit	
	Total Credits	18 (16+2)		

SEMESTER 2

Sr.	C. Code	Course Name	Credit Hours	Domain
1	CS3506	Object Oriented Programming	4(3+1)	Core
2	MATH3512	Linear Algebra (IDS II)	3(3+0)	
3	CS3508	Digital Logic Design	4(3+1) *	Core
4	MATH3509	Calculus-II	3(3+0)	GER
5	MATH3518	Pre-Calculus-II	Non credit	
6	URD3503	Pakistani Adab-1	2(2+0)	GER
7	TFSR 3502	Fehm e Quran I	1(1+0)	GER
8	PKST3501	Pakistan Studies	2(2+0)	GER
	Total Credits	19(17+2)		

SEMESTER 3

Sr.	C. Code	Course Name	Credit Hours	Domain
1	CS4521	Data Structures and Algorithms	4(3+1)	Core

2	CS4523	Artificial Intelligence	3(2+1)	Core
3	CS4524	Computer Networks	3(2+1)	Core
4	CS4525	Software Engineering	3(3+0)	Core
5	SOC3503	Civics and Community Engagement	2 (2+0)	GER
6	TFSR 4501	Fehm e Quran II	1(1+0)	GER
7	ENVS4501	Basics of Environmental Science	3(2+1)	GER
Total Credits			19(15+4)	

SEMESTER 4

Sr.	C. Code	Course Name	Credit Hours	
1		Computer Organization & Architecture	4(3+1) new	Core
2	ITHD3501/ HADH3501	Islamic Studies/Ethics	2 (2+0)	GER
3	CS4527	Theory of Automata	3 (3+0)	Core
4	PKST3502	Ideology and Constitution of Pakistan	2 (2+0)	GER
5	ENGL3504	Expository Writing	3(3+0)	GER
6	MGT3503	Entrepreneurship	2 (2+0)	GER
7	CS5502	Operating Systems	3(2+1)	Core
Total Credits			19(16+2)	

SEMESTER 5

Sr.	C. Code	Course Name	Credit Hours	Domain
1	CS3507	Database Systems	4 (3+1)	
2		Domain Elective 1	3(2+1)	
3	PHY4509	Applied Physics (IDS III)	3(2+1)	
4	STAT4509	Statistics and Probability (IDS IV)	3(3+0)	
5	CS6507	Internship/Field Experience	3 (0+3)	
Total Credits:			16(13+3)	

SEMESTER 6

Sr.	C. Code	Course Name	Credit Hours	Domain
1	CS4522	Information Security	3(2+1)	Core
2		Domain Elective 2	3 (2+1)	Elective
3		Domain Elective 3	3 (2+1)	Elective
4		Domain Elective 4	3 (2+1)	Elective
5	SERT3501	Seerat-e-Tayyaba	Non Credit	
			12(8+4)	

SEMESTER 7

Sr.	C. Code	Course Name	Credit Hours	Domain
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1	CS5515	Cloud Computing	3(2+1)	Core
2		Domain Elective 5	3(2+1)	Elective
3		Domain Elective 6	3(2+1)	Elective
4		Mobile Application Development	3(2+1)	Core
5	CS6501	Final Year Project – I	2 (0+2)	
Total Credits:			14(8+6)	

SEMESTER 8

Sr.	C. Code	Course Name	Credit Hours	Domain
1	CS6504	Final Year Project – II	4(0+4)	
2	CS6502	Analysis and Design of Algorithm	3 (3+0)	Core
3		Domain Elective 7	3 (2+1)	Elective
4		Domain Elective 8	3 (2+1)	Elective
Total Credits:		13 (7+6)		

Specializations: Software Engineering

HEC Courses	Credit Hours	C. Code	Remarks
1. Software Requirement	3+0	CS5529	2+1 in our

Engineering			scheme
2. Software Project Management	3+0	CS6524	2+1 in our scheme
3. Software Quality and Testing	2+1	CS5513	2+1 S/W Testing & Quality Assurance
4. DevOps Principles and Practices	2+1/3+0		
5. Software Re-Engineering	2+1/3+0		
6. Software Design and Architecture	3+0	CS4522	2+1
7. Parallel and Distributed Computing	2+1/3+0	CS5506	2+1
8. Software Construction and Development	2+1/3+0	CS5521	2+1
9. Human Computer Interaction	2+1/3+0	CS6512	2+1 HCI
10. Formal Methods and Design	3+0		
11. Cross-platform Application Development	3+0		
12. Advanced Topics in Software Engineering	2+1/3+0		
13. Machine Learning	2+1	CS5501	2+1 Machine Learning
14. Internet of Things and Its Applications	2+1		
15. Green Software Engineering	3+0		

Data Science

1. Introduction to Data Science	3+0	CS4538	2+1
2. Computational Statistics	3+0		
3. Data Engineering	3+0		
4. Data Visualization	3+0	CS6514	2+1
5. Business Intelligence	3+0		
6. Tools and Techniques in Data Science	3+0		
7. Big Data Analytics	3+0	CS5521	2+1
8. Machine Learning	3+0	CS5501	2+1 Machine Learning CS5501
9. Deep Learning	3+0		ANN & DL, 2+1 in our scheme
10. Natural Language Processing	3+0	CS6521	2+1 NLP
11. Data Ethics & Security	3+0		
12. Computer Vision	3+0	CS6516	CV 2+1
13. Information Retrieval	3+0		
14. Generative AI	3+0		
15. Data Mining	3+0	CS4516	2+1 Data mining

Artificial Intelligence

HEC Courses	Credit Hours		Remarks
1. Programming for AI	3+0	CS4540	2+1 in our scheme
2. Machine Learning	3+0	CS5501	2+1 in our scheme
3. Deep Learning	3+0	CS6513	ANN & DL, 2+1 in our scheme
4. Knowledge representation and Reasoning	3+0	CS6522	2+1 in our scheme
5. Generative AI	3+0		
6. Computer Vision	3+0	CS6516	2+1 in our scheme
7. Natural Language Processing	3+0	CS6521	2+1 in our scheme
8. Data Mining	3+0	CS4516	2+1 in our scheme
9. Reinforcement Learning	3+0	CS6519	2+1 in our scheme
10. Optimization Techniques	3+0		
11. Stochastic Processes	3+0		
12. Machine learning Operations (MLOps)	3+0		
13. Agentic AI	3+0		
14. Speech Processing	3+0		
15. Evolutionary Computing & Swarm Intelligence	3+0		

Cyber Security

1. Information Assurance	3+0	CS4541	(2+1)
2. Network Security	2+1	CS6509	2+1
3. Secure Software Design and Development	2+1	CS5523	2+1
4. Digital Forensics and Incident Response	2+1	CS5525	2+1
5. Applied Cryptography	2+1		NEW course 2+1
6. Vulnerability Assessment and Penetration Testing	2+1		
7. Ethics in Cyber Security	2+1		
8. Cloud Security	2+1		New course 2+1
9. Embedded Systems Security	2+1		
10. Cyber Threat Intelligence	2+1		New course 2+1
11. Artificial intelligence for Cyber Security	2+1		
12. IoT Security	2+1		
13. Open-Source Intelligence Techniques	2+1		
14. Usable Security and Privacy	2+1		
15. Malware Analysis and Reverse Engineering	2+1		
16. Security Orchestration and Response	Automation 2+1		
17. Cyber Security Policy and Governance	3+0		

18. Security Analytics and DevSecOps	2+1		
19. Quantum Security	2+1		
20. Blockchain and Web 3 Security	2+1		
21. Wireless and Mobile Security	2+1	CS5527	OK2+1

Information Technology

Course Name	Credit Hours		Remarks
1. Web Technologies	2+1	CS5507	
2. Cyber Security	2+1	CS5512	
3. Database Administration & Management	2+1	CS5518	
4. System & Network Administration	2+1	CS5519	
5. Information Technology Infrastructure	2+1	CS6508	
6. Network Security	2+1	CS6509	
7. Data Communication	2+1	3413	
8. Wireless and Mobile Networks	2+1		
9. Cloud Infrastructure and Services	2+1	New	
10. Email Systems and Server	2+1		

Management			
11. Ethical Hacking and Penetration Testing	2+1		
12. Security Policies and Compliance	3+0		
13. IT Project Management	3+0		
14. Systems Analysis and Design	3+0		
15. Technology Lifecycle Planning	3+0		

Fee Tariff for First semester

Items	Rates
Registration fee (once at time of admission)	Rs. 650/-
Admission fee (once at time of admission)	Rs. 1300/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology fee	Rs. 800/-
Per credit hour fee: Rs 2600*18	Rs. 46800/-
Lab charges	Rs. 7100/-
Total	Rs. 58150/-

BS DATA ANALYTICS (Program Code 5111)

BS Data Analytics Program Objectives

The Program Aims to

- Develop students' expertise in statistical and machine learning tools for data analysis.
- Equip students with skills in data management, programming, and visualization.
- Teach students to solve real-world problems using analytical tools and statistical reasoning.
- Prepare students for careers in business intelligence, healthcare analytics, financial modelling, and public policy analysis.

BS Data Analytics Program Learning Outcomes

Graduates of this program will be able to

- Collect, preprocess, and manage large datasets using computing languages and statistical software.
- Apply statistical and machine learning models to derive insights from data.
- Design effective data visualizations to communicate insights to non-technical audiences.
- Use data analytics to support decision-making in a variety of fields.
- Work effectively in cross-disciplinary terms to address complex problems.

SCHEME OF STUDIES FOR NEW BS DATA ANALYTICS (4) Year Program

Semester-1

Sr. No.	Course Title	Course Code	Credit Hours	Category
1	Functional English	ENG 3505	3(3+0)	GE-1
2	Quantitative Reasoning-I	MATH3508	3(3+0)	GE-2
3	Pakistan Adab-I	URD3501	2(2+0)	GE-3
4	Islamic studies	ITHC3501/HADH3501	2(2+0)	GE-4
5	Statical Mathematics for Beginners	STAT3510	3(3+0)	Major-1
6	Seerat-e-Tayyab	SERT3501	NC	
7	Introduction to Data Analytics	STAT3511	3(20+1)	Major-II

Credit Hours 16

Semestert-2

Sr. No.	Course Title	Course Code	Credit Hours	Category
1	Expository Writing	ENGL 3504	3(3+0)	GE-5
2	Civics and Community Engagement	SOC3503	2(2+0)	GE-6
3	Calculus-I	MATH 3502	3(3+0)	IDS-1
4	Ideology and	PAKST3502	2(2+0)	GE-7

	Constitution of Pakistan			
5	Applications of ICT	CS3501	3(2+1)	GE-8
6	Fundamentals of Programming	STAT3512	3(3+0)	Major-3
7	Fahm ul Quran-I	TFSR3502	1(0+1)	GE-9

Credit Hours 17

Semester-3

Sr. No.	Course Title	Course Code	Credit Hours	Category
1	Fahm ul Quran-I	TFSR4501	1(0+1)	GE-10
2	Calculus-ii	MATH3509	3(3+0)	IDS-2
3	Sampling and Sampling Distributions	STAT3507	3(3+0)	Major-4
4	Entrepreneurship	MGT3503	2(2+0)	GE-11
5	Data Visualization	STAT4511	3(2+1)	Major-5
6	Pakistan Studies	PKST3501	2(2+0)	GE-12
7	Introduction of Probability and Probability Distributions	STAT3503	3(3+0)	Major-6

Credit Hours 17

Semester-4

Sr. No.	Course Title	Course Code	Credit Hours	Category
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1	Regression analysis	STAT5507	3(3+0)	Major-7
2	Basic Statistical Inference	STAT4501	3(3+0)	Major-8
3	Simulation techniques in data Analytics	STAT4512	3(3+0)	Major-9
4	Quantitative Reasoning-II	MATH4502	3(3+0)	GE-13
5	Data Wrangling	STAT4510	3(2+1)	Major-10
6	Basics of Environmental sciences	ENVS4501	3(2+1)	GE-14

Total Credit Hours 18

Semester-5

Sr. No.	Course Title	Course Code	Credit Hours	Category
1	Big Data Analytics	STAT6537	3(2+1)	Major-11
2	Design and analysis of Experiments	STAT5512	3(3+0)	Major-12
3	Predictive Modelling	STAT6534	3(2+1)	Major-13
4	Statistical Methods for Data Mining	STAT6519	3(2+1)	Major-14
5	Mathematical	MATH4504	3(3+0)	IDS-3

	Methods			
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Total Credit Hours 15

Semester-6

Sr. No.	Course Title	Course Code	Credit Hours	Category
1	Linear Algebra	MATH3512	3(3+0)	IDS-4
2	Computing Tools for Data Analytics	STAT5515	3(2+1)	Major-15
3	Statistical Artificial Intelligence	STAT6521	3(2+1)	Major-16
4	Analysis and Design of Algorithms	STAT5516	3(2+1)	Major-17
5	Internship	STAT6514	3(0+3)	FE

Total Credit Hours 15

Semester-7

Sr. No.	Course Title	Course Code	Credit Hours	Category
1	Time Series Analysis and Forecasting	STAT6538	3(3+0)	Major-18
2	Statistical Machine Learning	STAT6520	3(2+1)	Major-19
3	Digital	STAT6536	3(2+1)	Major-20

	Analytics			
4	Statistical Programming Using R and Python	STAT6516	3(2+1)	Major-21
5	Capstone Project	STAT6515	3(0+3)	Project

Credit Hours 15

Semester-8

Sr. No.	Course Title	Course Code	Credit Hours	Category
1	Cloud Computing for Data Analytics	STAT6539	3(2+1)	Major-22
2	Statistics for Deep Learning	STAT6518	3(2+1)	Major-23
3	Geospatial Analytics	STAT6540	3(2+1)	Major-24
4	High Dimensional Data Analysis	STAT6522	3(2+1)	Major-25
5	Applied Multivariate Analysis	STAT6506	3(3+0)	Major-26

Credit Hours 15

Summary of the Program:

Total Credit Hours: 128

Minimum Duration: 8 Semester (4 Years)

Maximum Duration: 12 Semester (6 Years)

Eligibility Criteria:

Higher secondary school certificate (involving 12 years of schooling) or an IBCC equivalent qualification in any group of studies is the minimum eligibility requirement for admission to the Bachelor of Science in Statistics.

5. Fee Tariff for 1st Semester

Item	Rates
Registration Fee (Once at time of admission)	Rs.650/-
Admission Fee (Once at time of admission)	Rs.1300/-
Degree Fee (Once at time of admission)	Rs.1500/-
Technology Fee	Rs.800/-
Per 1 Credit course ----2600*16	Rs. 41600/-
LAB CHARGES	Rs.1000/-
Total	Rs. 45350/-

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 (Programme Code 5067)

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:** 128 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 Pakistan	Ideology and Constitution	2(2+0)	PKST3502
Quantitative Reasoning	Quantitative Reasoning-I	3(3+0)	MATH3508
Islamic Studies	Islamic Studies /	2(2+0)	ITHC3501/

/ Ethics	Ethics		HADH 3501
Pakistani Adab-1	Arts and Humanities	2(2+0)	URD3503
Cell Biology	Interdisciplinary	3(2+1)	BIO 3507
Total		15	Credit Hours

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
Pak. Studies	GE	2(2+0)	PKST 3501
Total		18	Credit Hours

Semester 3

Name of Subject	Academic Cluster	Credit Hours	Course Code
Entrepreneurship	Entrepreneurship	2(2+0)	MGT3503
Basics of Environmental	Natural Sciences	3(2+1)	ENVS4501

Science			
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	Credit Hours

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	Credit Hours

Major Horticulture 5th Semester

Name of Subject	Academic Cluster	Credit Hours	Course Code
Principles of Fruit Production	Major	3(2+1)	AGSI5513
Principles of	Major	3(2+1)	AGSI5514

Vegetable Production			
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
		18	Credit Hours

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 Aromatic Plants	Major	3(2+1)	AGSI5522
Post-Harvest Horticulture	Major	3(2+1)	AGSI5523
Mushroom Culture	Major	3(2+1)	AGSI5524
Seerat-e-Tayyaba	Compulsory course	Noncredit	SERT3501
		18	Credit Hours

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
		18	Credit Hours

8th Semester

Name of Subject	Academic Cluster	Credit Hours	Course Code
Internship	Major	3(0+3)	AGSI6514
Capstone Project	Major	3(0+3)	AGSI6515
		6	Credit Hours
Grand Total		130 Credit Hours	

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
		18	Credit Hours

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
		18	Credit Hours

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
		18	Credit Hours

8th Semester

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

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
		18	Credit Hours

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 Utilization	Major	3(2+1)	AGSI5509
Climate Smart Agriculture in Pakistan	Major	3(3+0)	AGSI5512
Seerat-e-Tayyaba	Compulsory course	Noncredit	SERT3501
		18	Credit Hours

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
		18	Credit Hours

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	Credit Hours
Grand Total		130 Credit Hours	

Evaluation and Assessment

Fee Tariff

Registration Fee	Rs. 650/-
Admission Fee	Rs. 1300/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs. 800/-
Fee for per 1 credit hour 2600 x 15	Rs. 39000/-
Lab Fee	Rs. 3300/-
Total Fee	Rs. 46550/-

FACULTY OF EDUCATION

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.

Educational Planning, Policy Studies and Leadership (EPPSL)

The department was established in 1976 and 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 (5063)

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

FA/F.Sc or Equivalent is the eligibility criteria.

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
PKST 3501	Pak. Studies	2+0	
Total Credit Hours (Theory + Practical) 13+2=15+2=17			
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	3+0	IDC

	Work		
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
5947	Internship	0+3	Internship
Total Credit Hours (Theory + Practical) 13+5=18			
SEMESTER 7			
5978	Common Sports Injuries & Common Treatment and Rehabilitation	3+0	MC
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	3+0	MC

	Education		
5986	Wellness and Fitness /Fitness	3+0	MC
5948	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

Fee Tariff

Registration Fee	Rs. 650/-
Admission Fee	Rs. 1300/-
Degree Fee (Once at time of admission)	Rs. 1500/-
Technology Fee	Rs. 800/-
Fee for per 1 credit hour 2600*16	Rs. 41600/-
Total Fee	Rs. 45850/-

GENERAL INFORMATION

- i. The certificates/degrees of AIOU are equivalent to any other recognized Board/University.
- ii. A candidate is required to submit complete admission form and upload scan documents through online system before or on the closing date.
- iii. 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.
- iv. 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

- **BANKS OR THROUGH TELCOS.**
- Eligible candidates 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. 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.

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

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.

Through 1-Link Modes/Channels

In addition to the existing fee payment modes, fee can also be paid through below mentioned 1-Link modes/channels.

Note:

For fee payment through 1- Link banks, website, digital banking and outlets, please enter **1Bill Prefix: 10004717950** before challan number.

Fee payment through IBFT/ RAAST/ Funds Transfer Mode is not allowed

Over the Counter

In addition to over the counter fee payment facility through ABL, MCB, FWBL and NBP, the fee can also be paid by visiting any branch of the banks mentioned below.

- 1 Link Banks (Al Barka, Askari Bank, Bank Islami, Meezan Bank, Faysal, Bank, JS Bank, Habib Metro, NRSP bank)

Web-Based

- Credit/Debit Card

All Master/VISA/Pay Pak/ Union Pay Credit/Debit Cards

For web-based fee payments, please click on PAY button available on OAS/CMS/AIOU website or directly go to aiou.kuickpay.com

Digital Banking

Mobile Banking, Internet Banking and ATM of banks

Note:

For payment through digital banking, select 1Bill option from the Bank app, internet banking or ATM.

Outlets

TCS, Leopard, NADRA e Sahulat, HBL Konnect

ہدایات برائے درستگی نام طالب علم / والد / تارخ پیدائش

☆ درخواست بذریعہ CMS Student Service Request یا فارم ہذا کے ذریعے جمع

کروائی جاسکتی ہے۔ دونوں صورتوں میں طالب علم کی درخواست کی منظوری ڈائریکٹر شعبہ

داخلہ سے لی جائے گی اور ان کا فیصلہ حتمی ہو گا۔ منظوری کے بعد متعلقہ اہلکار چالان

فارم Generate کرے گا اور طالب علم کو مطلع کرے گا اس کے بعد طالب علم فیس جمع کروا

کر ترمیم حاصل کر سکے گا۔

☆ منظوری سے قبل ہرگز فیس جمع نہ کروائیں جمع کروائی گئی فیس واپس نہ ہوگی۔

☆ گورنمنٹ کے نوٹیفیکیشن اور یونیورسٹی قوانین کے مطابق سرکاری و نیم سرکاری اداروں

کے ملازمین کی تاریخ پیدائش جو کہ ملازمت ریکارڈ میں درج ہے تبدیل نہیں ہوگی۔
☆ اگر کسی طالب علم کو ایک سے زائد پروگرامز میں تصحیح درکار ہے تو طالب پہلے رجسٹرڈ پروگرام کے مطابق صرف ایک بار فیس جمع کروائے گا اور اگلے پروگرامز میں تصحیح کی فیس وصول نہیں کی جائے گی۔

☆ اگر کوئی طالب علم اپنے نام اور ولدیت کی درستگی / تبدیلی ایک ہی درخواست میں کروانا چاہتا ہے تو وہ یونیورسٹی سے جاری کردہ چالان کے مطابق صرف ایک ہی فیس جمع کروائے گا۔

☆ فیس کی تفصیل درج ذیل ہے۔

Sr. No.	Time Frame	Amount (Rs)			
		Correction in Name Spelling	Change in Name	Correction in Father's Name	Correction in Date of Birth
1	Within 2 years of Passing Program	Rs.1500/-	Rs.3000/-	Rs.3000/-	Rs.4000/-
2	After 2 to 5 years	Rs.3500/-	Rs.4500/-	Rs.4500/-	Rs.5500/-
3	After 5 to 10 years	Rs.5000/-	Rs.6000/-	Rs.6000/-	Rs.7500/-
4	After 10 years	Rs.10000/-	Rs.12000/-	Rs.12000/-	Rs.14000/-

1. نوٹ: پروگرام پاس کرنے سے پہلے نام یا تاریخ پیدائش میں درستگی کے لیے فیس نہیں لی جائے گی۔

REGULATIONS FOR REFUND OF ADMISSION FEE

- 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.
- 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.
- 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.
- The Treasurer Department shall verify the fee of students and shall send the case to the Audit Department for pre-audit.
- The cheque will be issued to the candidate by the Campus Payment Section (CPS), Treasurer's Department.
- 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.
- In case the students who are not allowed/granted admission to a program offered by the University due to less enrollment/non formation of viable group/non offering of courses, full fee will be refunded to them.
- 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

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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	Rawalpindi	Mr. Muhammad Raza Vaince, Regional Coordinator, Allama Iqbal Open University, Senior Headmaster (Rtd.), Rakh Printing Press, Pindi Road, Tehsil KallarSyedan, District Rawalpindi.	0300-9700563
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6	Rawalpindi	Dr. Muhammad Anwar, Regional Coordinator, Allama Iqbal Open University, Headmaster, Govt. High School, Bhabra Tehsil Wah Cantt District Rawalpindi.	0300-5363883
7	Rawalpindi	Mr. Shakeel Ahmed, Regional Coordinator, Allama Iqbal Open University, EST, Village & Post Office Rupper Kalan, Sub Tehsil Chakbeli Khan, District Rawalpindi.	0334-5290864
8	Rawalpindi	Mr. Arshad Mehmood, Regional Coordinator, Allama Iqbal Open University, Principal, Govt. MC Higher Secondary School, Tehsil Gujar Khan district Rawalpindi	0336-5355163

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