

ADMISSION AUTUMN 2023

AI^oU

PROSPECTUS

BS (Face to Face)

4 Years, 2.5 Years, and 2 Years

- i. Agricultural Technology
- ii. Biochemistry
- iii. Botany
- iv. Chemistry
- v. Computer Science
- vi. Environmental Sciences
- vii. Instructional Design & Technology
- viii. Mathematics
- ix. Microbiology
- x. Physics
- xi. Statistics



Allama Iqbal Open University, Islamabad

www.aiou.edu.pk

Help Line: (051) 111-112-468

PROSPECTUS
OF
BS (Face to Face) Programmes
For
SEMESTER: Autumn,2023



Allama Iqbal Open University, Islamabad

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| | |
|------------------------|------------------------------|
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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

IMPORTANT ACTIVITIES TO BE REMEMBERED

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

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

Amendment in re-registration and Re-Appear Policy

It was an approved policy of the AIOU earlier that three Reappear Chances used to be given to the students in the final term examinations and workshops to those students who either missed their final exam or failed. However, the said policy was revised and reappear chances in final exams & workshops have been abolished. Due to new policy, adverse effects on the enrollment of the university have been seen and it also caused distress among students leading to an increase in Court and Wafaqi Mohlasib Cases in manifold.

Keeping in view the hardships of the students and in order to improve the enrollment AKOJ. it is suggested that: -

At least one reappear chance in final exams may please be approved in favor of those students who either have missed their Final exams or failed in the final exam with the condition of re-enrollment in that course within the fifteen days of declaration of final exam results, to appear again in the Final exam component only, from Spring semester 2023

- i. Those students who pass the Final Exam component but fail to gain required aggregate marks in the respective course (s), shall have to re-enroll/re-register in that course and repeat all the components of that course (s).

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

| Sr. No. | Degree Level | Minimum Duration | Maximum Duration |
|----------------|--|-------------------------|-------------------------|
| 1 | Ph.D | 3 years / 5 semesters | 8 years * |
| 2 | MS/M.Phil/M.Sc (Hons)/MBA/COL MBA/MPA | 2 years / 4 Semesters | 4 Years ** |
| 3 | M.A/M.Sc (2-Year) | 2 Years / 4 Semesters | 4 Years |
| 4 | BS (4-Year) | 4 years / 8 Semesters | 6 Years |
| 5 | Postgraduate Diploma (1-Year) | 1 Year / 2 Semesters | 2 Years |
| 6 | Certificate (6-Months) | 6 Months / 1 Semester | 1 Years |
| 7 | BS 2.5 years | 2.5 Years/10 Semester | 5 Years |
| 8 | BS 2 Years | 2 years/ 8 Semester | 4 Years |

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

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

Follow these instructions to apply:

APPLY ONLINE (FRESH STUDENTS)

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

APPLY ONLINE (CONTINUE STUDENTS):

1. Visit website: <https://aiou.edu.pk/cms-continuing-students>
2. Press link “**CMS for Continuing Students**”; (<https://enrollment.aiou.edu.pk>)
3. Enter your “User ID & Password
4. Select courses and print challan form.
5. Using printed challan form, submit your fee in any branch of FWBL, UBL, MCB or ABL. 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 generations and improvement of quality of life and welfare of human beings through research for the environmentally sustainable and socially equitable use of natural resources. The Department is imparting face-to-face education in Pakistan in different disciplines of Biological Sciences.

The mission of the 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 generations and improvement of quality of life and welfare of human beings 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 the demand of society. This will help produce well-trained manpower meant to serve science both at national and international levels.

The Department is offering following programs:

- i. BS Botany
- ii. BS Biochemistry

iii. BS Microbiology

iv. M. Phil Microbiology and Molecular Genetics

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

BS BIOCHEMISTRY

1. Introduction

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

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

3. BS Biochemistry (2.5 Year)

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

1. Students holding a BSc degree 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 another discipline shall also be eligible for admission.

3.2 Duration of Program

BS Biochemistry (2.5 year) comprises of 5 semesters. The minimum period to complete this degree is 2.5 years and the maximum period for completion is 5 years.

3.3 Scheme of Studies

| Semester 1 (Bridging Semester) | | |
|---------------------------------------|---------------------------------|--------------------|
| Course Code | Course Title | Credit Hour |
| 4481 | Introductory Biochemistry | 4(3+1) |
| 4412 | Biotechnology | 4(3+1) |
| 4403 | Fundamentals of Microbiology | 4 (3+1) |
| 5468 | Introduction to Computer | 3 |
| 9467 | Pre-Calculus | 3 |
| | Total Credits | 18 |
| Semester 2 | | |
| Course Code | Course Title | Credit Hour |
| 7481 | Nutritional Biochemistry | 4(3+1) |
| 4482 | Biostatistics | 3(3+0) |
| 7412 | Genetics-1 | 3(3+0) |
| 4415 | Immunology | 4(3+1) |
| 7482 | Bio-membrane and cell signaling | 3(3+0) |
| | Total Credits | 17 |
| Semester 3 | | |
| Course Code | Course Title | Credit Hour |
| 7483 | Genomics | 4(3+1) |

| | | |
|--------------------|-----------------------|--------------------|
| 7484 | Protein Biochemistry | 4(3+1) |
| 4419 | Molecular Biology | 4(3+1) |
| 7413 | Scientific Research | 4(3+1) |
| | Total Credits | 16 |
| Semester-4 | | |
| Course Code | Course Title | Credit Hour |
| 7485 | Enzymology | 4(3+1) |
| 4413 | Medical Microbiology | 4(3+1) |
| 4407 | Microbial Genetics | 4(3+1) |
| 7486 | Clinical Biochemistry | 4(3+1) |
| | Total Credits | 16 |
| Semester-5 | | |
| Course Code | Course Title | Credit Hour |
| 4418 | Research Project | 6 |
| 4414 | Genetic Engineering | 4(3+1) |
| 7487 | Bioinformatics | 3(2+1) |
| | Total Credits | 13 |

Total Credit Hours= 80

3.4 Fee Tariff for 1st Semester

| | |
|---|-------------|
| Item | |
| Registration Fee (Once at time of admission) | Rs.550/- |
| Admission Fee (Once at time of admission) | Rs.1100/- |
| Technology Fee | Rs.550/- |
| Per 4 Credit hours course fee: Rs. 8800 | Rs. 26400/- |
| Per 3 Credit hours course fee: Rs. 6600 | Rs.13200/- |
| LAB CHARGES | Rs.3300/- |
| Total | Rs. 45100/- |

4. Mode of Study

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

4.1 Medium of Instruction:

The Medium of Instructions will be English.

4.2 Study Material:

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

4.3 Mode of Teaching

- a) University will provide face to face teaching to the students at main campus H-8 Islamabad.
- a) The schedule of classes and dates of submission of assignments will be announced by the department.

Assessment and Evaluation:

Student progress will be assessed based on the followings:

Continuous Assessment

- 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.

Final Examinations

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

5. Contact Details

Incharge

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

Coordinator BS-Biochemistry

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

BS BOTANY

1. Introduction

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

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

2. Objectives

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

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

3. BS Botany (2.5-Year)

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

1. Students holding a BSc degree 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 another discipline shall also be eligible for admission.

3.2 Duration of Programme

BS Botany (2.5-year) comprises of 5 semester. The minimum period to complete this degree is 2.5 years and the maximum period for completion is 5 years.

3.3 Scheme of Studies

| # | Semester 1 (Bridging Semester) | | |
|---|--------------------------------|-------------|-------------|
| | Course Title | Credit Hour | Course Code |
| 1 | Biotechnology | 4(3+1) | 4412 |
| 2 | Fundamentals of Microbiology | 4(3+1) | 4403 |
| 3 | Introduction to ICT | 3 | 5468 |
| 4 | Pre-Calculus | 3 | 9467 |
| 6 | Intro to Environmental Science | 4(3+1) | 4441 |
| | Total Credits | 18 | |
| # | | | |

| Semester 2 | | | |
|------------|-------------------------------|-------------|-------------|
| | Course Title | Credit Hour | Course Code |
| 1 | Biodiversity and Conservation | 4(3+1) | 4452 |
| 2 | Diversity of Vascular plants | 3(2+1) | 7401 |
| 3 | Plant Anatomy | 3(2+1) | 7402 |
| 4 | Introductory Biochemistry | 4(3+1) | 4481 |
| 5 | Phycology and Bryology | 3(3+0) | 7403 |
| | Total Credits | 17 | |
| Semester 3 | | | |
| | Course Title | Credit Hour | Course Code |
| 1 | Plant Ecology-1 | 3(2+1) | 7405 |
| 2 | Plant Physiology -1 | 3(2+1) | 7406 |
| 4 | Plant Biochemistry | 3(3+0) | 7407 |
| 5 | Mycology & Plant Pathology | 3(2+1) | 7408 |
| 6 | Molecular Biology | 4(3+1) | 4419 |
| | Total Credits | 16 | |
| # | Semester 4 | | |
| | Course Title | Credit Hour | Course Code |
| 1 | Plant ecology II | 3(2+1) | 7409 |
| 2 | Plant Physiology II | 3(2+1) | 7411 |
| 3 | Genetics I | 3(3+0) | 7412 |
| 4 | Biostatistics | 3(3+0) | 4482 |
| 5 | Scientific Research | 4(3+1) | 7413 |
| | Total Credits | 16 | |
| # | | | |

| Semester 5 | | | |
|-------------------|---------------------|--------------------|--------------------|
| | Course Title | Credit Hour | Course Code |
| 1 | Research Project | 6 | 4418 |
| 2 | Genetics II | 3(3+0) | 7414 |
| 3 | Ethnobotany | 3 | 4439 |
| 4 | Plant Systematics | 3(2+1) | 7410 |
| | | 15 | |

Total Credit Hours: 82

3.4 Fee Tariff for 1st Semester

| Item | |
|---|-------------|
| Registration Fee (Once at time of admission) | Rs.550/- |
| Admission Fee (Once at time of admission) | Rs.1100/- |
| Technology Fee | Rs.550/- |
| Per 4 Credit hours course fee: Rs. 8800 | Rs. 26400/- |
| Per 3 Credit hours course fee: Rs. 6600 | Rs.13200/- |
| LAB CHARGES | Rs.3300/- |
| Total | Rs. 45100/- |

4. Mode of Study

4.1 Medium of Instruction

The Medium of Instructions for BS Botany will be English.

4.2 Study Material

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

4.3 Mode of Teaching

a) University will provide face to face teaching

b) The schedule of classes and dates of submission of assignments will be handed over along with study material.

Assessment and Evaluation:

Student progress will be assessed based on the followings:

Continuous Assessment

- iii. 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.
- iv. 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.

Final Examinations

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

5. Contact Details

Incharge

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

Coordinator BS Botany

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

BS MICROBIOLOGY

1. Introduction

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 to 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 Bio-medical sciences, which is very important to diagnose the infectious diseases as well as epidemics. The overall objective 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 a foundation for higher studies in Microbiology.

3. BS Microbiology (2.5-Year)

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

1. Students holding a BSc degree 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 another discipline shall also be eligible for admission.

Duration of Programme

BS Microbiology (2.5-year) comprises of 5 semester. The minimum period to complete this degree is 2.5 years and the maximum period for completion is 5 years.

3.3 Scheme of Studies

| Semester 1 (Bridging Semester) | | |
|--------------------------------|---------------------------------------|-------------|
| Course Code | Course Title | Credit Hour |
| 4403 | Fundamentals of Microbiology | 4(3+1) |
| 4441 | Introduction to Environmental Science | 4(3+1) |
| 4412 | Biotechnology | 4(3+1) |
| 9467 | Pre-Calculus | 3 |
| 5468 | Introduction to Computer | 3 |
| | Total Credits | 18 |
| | | |

| Semester 5 | | |
|--------------------|--|--------------------|
| Course Code | Course Title | Credit Hour |
| 4481 | Introductory Biochemistry | 4(3+1) |
| 4482 | Biostatistics | 3(3+0) |
| 4407 | Microbial Genetics | 4(3+1) |
| 4408 | Virology | 4(3+1) |
| | Total credits | 15 |
| Semester 6 | | |
| Course Code | Course Title | Credit Hour |
| 4419 | Molecular Biology | 4(3+1) |
| 4416 | Molecular Mechanism of Antimicrobial Drugs | 4(3+1) |
| 4411 | Food and Dairy Microbiology | 4(3+1) |
| 4405 | Microbial Anatomy and Physiology | 4(3+1) |
| 7413 | Scientific Research | 4(3+1) |
| | Total credits | 20 |
| Semester 7 | | |
| Course Code | Course Title | Credit Hour |
| 4415 | Immunology | 4(3+1) |
| 4413 | Medical Microbiology | 4(3+1) |
| 4420 | Industrial Microbiology | 4(3+1) |
| 4410 | Soil Microbiology | 4(3+1) |
| | Total credits | 16 |
| Semester 8 | | |

| Course Code | Course Title | Credit Hour |
|--------------------|---------------------|--------------------|
| 4417 | Epidemiology | 4(3+1) |
| 4418 | Research Project | 6 |
| 4414 | Genetic Engineering | 4(3+1) |
| | Total credits | 14 |

Total Credits Hours= 83

3.4 Fee Tariff For 1st Semester

| Item | |
|--|-------------|
| Registration Fee (Once at time of admission) | Rs.550/- |
| Admission Fee (Once at time of admission) | Rs.1100/- |
| Technology Fee | Rs.550/- |
| Per 4 Credit hours course fee: Rs. 8800 | Rs. 26400/- |
| Per 3 Credit hours course fee: Rs. 6600 | Rs.13200/- |
| LAB CHARGES | Rs.3300/- |
| Total | Rs. 45100/- |

4 BS Microbiology (2-Year)

Eligibility Criteria for BS Programs (Ad Based in relevant field with at least 60 credit hours)

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

Duration of Programme

The student will have to earn a total of 65 credit hours within a minimum of 2 years (4 semester) and maximum period for completion is 5 years.

4.1 Scheme of Studies

| Semester 1 | | |
|-------------|--|-------------|
| Course Code | Course Title | Credit Hour |
| 4481 | Introductory Biochemistry | 4(3+1) |
| 4482 | Biostatistics | 3(3+0) |
| 4407 | Microbial Genetics | 4(3+1) |
| 4408 | Virology | 4(3+1) |
| | Total credits | 15 |
| Semester 2 | | |
| Course Code | Course Title | Credit Hour |
| 4419 | Molecular Biology | 4(3+1) |
| 4416 | Molecular Mechanism of Antimicrobial Drugs | 4(3+1) |
| 4411 | Food and Dairy Microbiology | 4(3+1) |
| 4405 | Microbial Anatomy and Physiology | 4(3+1) |
| 7413 | Scientific Research | 4(3+1) |
| | Total credits | 20 |
| Semester 3 | | |
| Course Code | Course Title | Credit Hour |
| 4415 | Immunology | 4(3+1) |
| 4413 | Medical Microbiology | 4(3+1) |
| 4420 | Industrial Microbiology | 4(3+1) |
| 4410 | Soil Microbiology | 4(3+1) |
| | Total credits | 16 |

| Semester 4 | | |
|-------------|---------------------|-------------|
| Course Code | Course Title | Credit Hour |
| 4417 | Epidemiology | 4(3+1) |
| 4418 | Research Project | 6 |
| 4414 | Genetic Engineering | 4(3+1) |
| | Total credits | 14 |

Total Credits = 65

4.2 Fee Tariff For 1st Semester

| Item | |
|--|-------------|
| Registration Fee (Once at time of admission) | Rs.550/- |
| Admission Fee (Once at time of admission) | Rs.1100/- |
| Technology Fee | Rs.550/- |
| Per 4 Credit hours course fee: Rs. 8800 | Rs. 26400 |
| Per 3 Credit hours course fee: Rs. 6600 | Rs.6600/- |
| LAB CHARGES | Rs.3300/- |
| Total | Rs. 38500/- |

5 Mode of Study

5.1 Medium of Instruction

The Medium of Instructions for BS Microbiology will be English.

5.2 Study Material

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

5.3 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 announced by the department.

5.4 Assessment and Evaluation

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

Assessment and Evaluation:

Student progress will be assessed based on the followings:

Continuous Assessment

- v. 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.
- vi. 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.

Final Examinations

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

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. Fill login details and login to the portal

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

6. Contact Details

Incharge

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

Coordinator BS-Microbiology

Department of Biology
Research Complex, 1st Floor, AIOU, H-8, Islamabad
Tel: 051 9057730; Email: biology@aiou.edu.pk

7. Faculty Members

1. Dr. Hina Fatimah

Incharge, Department of Biology
Ph. 051-9575271

2. Dr. Muhammad Waseem

Assistant Professor, Ph. 051-9575274

3. Dr. Rizwana Kousar

Assistant Professor, Ph. 051-9575273

4. Dr. Sobia Kanwal,

Assistant Professor, Ph. 051-9575275

5. Dr. Saba Farooq

Lecturer, Ph. 051-9575284

6. **Ms. Samar Naseer**
Lecturer, Ph. 051-9057185
7. **Ms. Zainab Syed**
Lecturer, Ph. 051-9575283
8. **Dr. Sadia Latif**
Research Associate, Ph. 051-9575286

DEPARTMENT OF ENVIRONMENTAL SCIENCE

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

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

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

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

The Department is offering undergraduate programs:

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

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

BS ENVIRONMENTAL SCIENCE

Introduction

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

environmental pollution and natural resource degradation with the aim to train students to combat pollution and ensure sustainable development in the country.

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

Objectives

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

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

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

BS Environmental Science (4-Year Program)

Eligibility Criteria

- i. F. Sc (premedical or pre-engineering) / DAE or equivalent qualification with minimum 33% marks is

the pre-requisite for admission in BS Environmental Science.

- ii. Foreign certificate/ degree holders will need to produce equivalence certificate from IBCC.

Duration of Program

To be eligible for the award of BS in Environmental Science, the student will have to complete 127 credit hours including six credit hours for research project, within a minimum period of 4 years (8 semester). Failing which a student can be given an extension of two years(4 semester) in minimum, after completion of initial period.

Scheme of Studies

| Semester 1 | | |
|---------------------------|--|--------------|
| Course Code | Course Title | Credit hours |
| BIO 3501 | Cell Biology, Genetics and Evolution | 4(3+1) |
| CHEM 3501 | Inorganic Chemistry | 4(3+1) |
| EMVS 3501 | Introduction to Environmental Science | 4(3+1) |
| MATH 3501 | Pre-Calculus | 3(3+0) |
| ENGL 3501 | English I: Composition and Comprehension | 3(3+0) |
| Total Credit hours | | 18 |

| Semester 2 | | |
|-------------|---------------------|--------------|
| Course Code | Course Title | Credit hours |
| BIO 3504 | Diversity of Plants | 4(3+1) |

| | | |
|---------------------------|--|-----------|
| CHEM 3502 | Organic Chemistry | 4(3+1) |
| ENVS 3501 | Environmental Pollution | 4(3+1) |
| MATH 3502 | Calculus-I | 3(3+0) |
| ENGL 3503 | English II: Technical and Business Writing | 3(3+0) |
| Total Credit hours | | 18 |

Semester 3

| Course Code | Course Title | Credit hours |
|---------------------------|-----------------------------------|--------------|
| ENVS 3505 | Diversity of Animals | 4(3+1) |
| BIO 3502 | Fundamentals of Microbiology | 4(3+1) |
| PKST 3501 | Pakistan Studies | 2 |
| ENG 3502 | English III: Communication Skills | 3(3+0) |
| Total Credit hours | | 13 |

Semester 4

| Course Code | Course Title | Credit hours |
|---------------------------|----------------------------|--------------|
| BIO 4501 | Biotechnology | 4(3+1) |
| Bio 3506 | Environmental Microbiology | 4(3+1) |
| CS 3501 | Introduction to Computer | 3(3+0) |
| MCM 3502 | Public Relations | 3(3+0) |
| ITHC 350/ HADH 3501 | Islamic Studies / Ethics* | 2 |
| Total Credit hours | | 16 |

Semester 5

| Course Code | Course Title | Credit hours |
|-------------|----------------------------|--------------|
| ENVS 5503 | Physics of the Environment | 4(3+1) |

| | | |
|-----------|--|-----------|
| ENVS 5501 | Environmental Chemistry | 4(3+1) |
| STAT 3506 | Biostatistics | 3(3+0) |
| ENVS 5502 | Environmental Policies and Regulations | 3(3+0) |
| | Total Credit hours | 14 |

Semester 6

| Course Code | Course Title | Credit hours |
|-------------|----------------------------------|--------------|
| ENVS 3506 | Environmental Biology | 4(3+1) |
| ENVS 5506 | Energy and Environment | 3(3+0) |
| ENVS 5505 | Intro of Environmental Economics | 3(3+0) |
| ENVS 5504 | Natural Resource Management | 3(3+0) |
| ENVS 3507 | Scientific Research | 4(3+ 1) |
| | Total Credit hours | 17 |

Semester 7

| Course Code | Course Title | Credit hours |
|-------------|---|--------------|
| BIO 5508 | Biodiversity and Conservation | 4(3+1) |
| ENVS 6503 | Health, Safety & Environmental Management Systems | 4(3+1) |
| ENVS 6501 | Environmental Impact Assessment | 4(3+1) |
| ENVS 6502 | Sustainable Development | 3(3+0) |
| ENVS 6504 | Environmental Toxicology | 3(3+0) |
| | Total Credit hours | 18 |

Semester 8

| Course Code | Course Title | Credit hours |
|-------------|---------------------------|--------------|
| BIO 6507 | Research Project | 6 |
| ENVS 6505 | Project Management | 3(3+0) |
| ENVS 6506 | GIS and Remote Sensing | 4(3+1) |
| | Total Credit hours | 13 |

Total Credits = 127

Fee Tariff

| Item | |
|---|-------------|
| Registration Fee (Once at time of admission) | Rs.550/- |
| Admission Fee (Once at time of admission) | Rs.1100/- |
| Technology Fee | Rs.550/- |
| Per 4 Credit hours course fee: Rs. 8800 | Rs. 26400 |
| Per 3 Credit hours course fee: Rs. 6600 | Rs.13200/- |
| Lab Charges | Rs.3300/- |
| Total | Rs. 45100/- |

BS Environmental Science (2.5-Year Program)

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

1. Students holding a BSc degree 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 another discipline shall also be eligible for admission.

Duration

To be eligible for the award of BS in Environmental Science, the student will have to complete minimum 83 credit hours including six credit hours for research project, within a minimum period of 2.5 years (5 semesters including bridging semester).

Scheme of Studies

| Semester 1 (Bridging Semester) | | |
|--------------------------------|--------------------------------|--------------|
| Course Code | Course Title | Credit hours |
| 4441 | Intro to Environmental Science | 4(3+1) |
| 4442 | Environmental Pollution | 4(3+1) |
| 4412 | Biotechnology | 4(3+1) |
| 5468 | Introduction to Computer | 3(2+1) |
| 9467 | Pre-Calculus | 3 (3+0) |
| Total Credit hours | | 18 |

| Semester 2 | | |
|---------------------------|---|--------------|
| Course Code | Course Title | Credit hours |
| 4467 | Physics of the Environment | 4(3+1) |
| 4443 | Environmental Chemistry | 4(3+1) |
| 4482 | Biostatistics | 3(3+0) |
| 4458 | Environmental Policies and Regulations | 3(3+0) |
| Total credits | | 14 |
| Semester 3 | | |
| Course Code | Course Title | Credit hours |
| 4446 | Environmental Biology | 4(3+1) |
| 4448 | Energy and Environment | 3(3+0) |
| 4444 | Intro of Environmental Economics | 3(3+0) |
| 4438 | Natural Resource Management | 3(3+0) |
| 7413 | Scientific Research | 4(3+ 1) |
| Total Credit hours | | 17 |
| Semester 4 | | |
| Course Code | Course Title | Credit hours |
| 4452 | Biodiversity and Conservation | 4(3+1) |
| 4455 | Health, Safety & Environmental Management Systems | 4(3+1) |
| 4450 | Environmental Impact Assessment | 4(3+1) |
| 4453 | Sustainable Development | 3(3+0) |
| 4456 | Environmental Toxicology | 3(3+0) |
| Total Credit hours | | 18 |

| Semester 5 | | |
|-------------|---------------------------|--------------|
| Course Code | Course Title | Credit hours |
| 4418 | Research Project | 6 |
| 4460 | Project Management | 3(3+0) |
| 4483 | GIS and Remote Sensing | 4(3+1) |
| | Total Credit hours | 16 |

Total Credit Hours= 83

Fee Tariff

| Item | |
|---|-------------|
| Registration Fee (Once at time of admission) | Rs.550/- |
| Admission Fee (Once at time of admission) | Rs.1100/- |
| Technology Fee | Rs.550/- |
| Per 4 Credit hours course fee: Rs. 8800 | Rs. 17600 |
| Per 3 Credit hours course fee: Rs. 6600 | Rs.13200/- |
| Lab Charges | Rs.3300/- |
| Total | Rs. 36300/- |

BS Environmental Science (2-Year Program)

Eligibility Criteria for BS Programs (Ad Based in relevant field with at least 60 credit hours)

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

Duration

To be eligible for the award of BS in Environmental Science, the student will have to complete minimum 65 credit hours including six credit hours for research project.

Scheme of Studies

| Semester 1 | | |
|-------------|---|--------------|
| Course Code | Course Title | Credit hours |
| 4467 | Physics of the Environment | 4(3+1) |
| 4443 | Environmental Chemistry | 4(3+1) |
| 4482 | Biostatistics | 3(3+0) |
| 4458 | Environmental Policies and Regulations | 3(3+0) |
| | Total Credit hours | 14 |
| Semester 2 | | |
| Course Code | Course Title | Credit hours |
| 4446 | Environmental Biology | 4(3+1) |
| 4448 | Energy and Environment | 3(3+0) |
| 4444 | Intro of Environmental Economics | 3(3+0) |
| 4438 | Natural Resource Management | 3(3+0) |
| 7413 | Scientific Research | 4(3+ 1) |
| | Total Credit hours | 17 |
| Semester 3 | | |
| Course Code | Course Title | Credit hours |
| 4452 | Biodiversity and Conservation | 4(3+1) |
| 4455 | Health, Safety & Environmental Management Systems | 4(3+1) |
| 4450 | Environmental Impact Assessment | 4(3+1) |
| 4453 | Sustainable Development | 3(3+0) |
| 4456 | Environmental Toxicology | 3(3+0) |
| | Total Credit hours | 18 |

| Semester 4 | | |
|---------------------------|------------------------|--------------|
| Course Code | Course Title | Credit hours |
| 4418 | Research Project | 6 |
| 4460 | Project Management | 3(3+0) |
| 4483 | GIS and Remote Sensing | 4(3+1) |
| Total Credit hours | | 16 |

Total Credit Hours: 65

Fee Tariff

| Item | |
|---|-------------|
| Registration Fee (Once at time of admission) | Rs.550/- |
| Admission Fee (Once at time of admission) | Rs.1100/- |
| Technology Fee | Rs.550/- |
| Per 4 Credit hours course fee: Rs. 8800 | Rs. 26400 |
| Per 3 Credit hours course fee: Rs. 6600 | Rs.13200/- |
| Lab Charges | Rs.3300/- |
| Total | Rs. 45100/- |

Mode of Study

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.

6.3 Mode of Teaching

b) University will provide face to face teaching to the students.

d) The schedule of classes and dates of submission of assignments will be handed over along with study material.

Assessment and Evaluation:

Student progress will be assessed based on the followings:

Continuous Assessment

vii. 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.

viii. 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.

Final Examinations

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

c) Guidelines for Online Application

- Visit AIOU Website: www.aiou.edu.pk
- Click on OAS (Online Admission System) for Fresh Admission

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

Contact Details

For further information, contact:

i. Chairperson,

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

ii. 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

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 (at least 2nd division with 33% marks) 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.

SEMESTER WISE COURSE OFFERING

Semester-1

| Course Code | Course Title | Credit Hours |
|---------------|--|--------------|
| PKST3501 | Pakistan Studies | 2(2+0) |
| ENGL3501 | English-1: Composition and Comprehension | 3(3+0) |
| BIO3501 | Cell biology, Genetics, and Evolution | 4(3+1) |
| MATH3501 | Pre-Calculus | 3(3+0) |
| CHEM3505 | Fundamentals of Chemistry | 4(3+1) |
| Total Credits | | 16 |

Semester-2

| Course Code | Course Title | Credit Hours |
|---------------------|---------------------------|--------------|
| ITHC 3501/HADH 3501 | Islamic Studies/Ethics | 2(2+0) |
| ENGL 3503 | English-II: Technical and | 3(3+0) |

| | | |
|---------------|---------------------------|--------|
| | Business writing | |
| BIO 3504 | Diversity of Plants | 4(3+1) |
| MATH 3502 | Calculus-I | 3(3+0) |
| CHEM 3501 | Inorganic Chemistry | 4(3+1) |
| CS 3501 | Introduction to Computers | 3(2+1) |
| Total Credits | | 19 |

Semester-3

| Course Code | Course Title | Credit Hours |
|---------------|--------------------------------------|--------------|
| GNGL 3502 | English-III: Communication and skill | 3(3+0) |
| CHEM 4501 | Basic Biochemistry | 4(3+1) |
| ENVS 5501 | Environmental Chemistry | 4(3+1) |
| CHEM3502 | Organic Chemistry | 4(3+1) |
| Total Credits | | 15 |

Semester-4

| Course Code | Course Title | Credit Hours |
|---------------|-------------------------|--------------|
| STAT 3507 | Statistics for Chemist | 4(3+1) |
| ENVS 3504 | Environmental Pollution | 4(3+1) |
| CHEM3503 | Physical Chemistry | 4(3+1) |
| CHEM3504 | Analytical Chemistry | 3(2+1) |
| MCM 3502 | Public Relations | 3(3+0) |
| Total Credits | | 18 |

Semester-5

| Course Code | Course Title | Credit Hours |
|-------------|------------------------|--------------|
| CHEM 3506 | Analytical Chemistry-1 | 3(3+0) |
| CHEM 3507 | Physical Chemistry-1 | 3(3+0) |

| | | |
|---------------|--------------------------|--------|
| CHEM 3508 | Organic Chemistry -1 | 3(3+0) |
| CHEM 3509 | Inorganic Chemistry-1 | 3(3+0) |
| CHEM 3510 | Mathematics for Chemists | 2(2+0) |
| CHEM 3511 | Chemistry Lab-I | 4(0+4) |
| Total Credits | | 18 |

Semester-6

| Course Code | Course Title | Credit Hours |
|---------------|-------------------------|--------------|
| CHEM 5501 | Analytical Chemistry-II | 3(3+0) |
| CHEM 5502 | Physical Chemistry-II | 3(3+0) |
| CHEM 5503 | Organic Chemistry-II | 3(3+0) |
| CHEM 5504 | Inorganic Chemistry-II | 3(3+0) |
| CHEM 5505 | Chemistry Lab-II | 4(0+4) |
| Total Credits | | 16 |

Specialization (Organic Chemistry)

Semester-7

| Course Code | Course Title | Credit Hours |
|---------------|--|--------------|
| CHEM 6501 | Heterocyclic Chemistry | 3(3+0) |
| CHEM 6502 | Stereochemistry of Organic Compounds | 3(3+0) |
| CHEM 6503 | Spectroscopic Methods in Organic Chemistry | 3(3+0) |
| CHEM 6504 | Advanced Organic Chemistry Lab-I | 3(3+0) |
| CHEM 6505 | Advanced Organic Chemistry Lab-II | 3(3+0) |
| Total Credits | | 15 |

Semester-8

| Course Code | Course Title | Credit Hours |
|---------------|------------------------------------|--------------|
| CHEM 6516 | Chemistry of Natural Products | 3(3+0) |
| CHEM 6517 | Special Organic Reactions | 3(3+0) |
| CHEM 6518 | Organic Synthesis | 3(3+0) |
| CHEM 6519 | Advanced Organic Chemistry Lab-III | 3(3+0) |
| CHEM 6520 | Advanced Organic Chemistry Lab-IV | 3(3+0) |
| Total Credits | | 15 |

Specialization (Inorganic Chemistry / Analytical Chemistry)**Semester-7**

| Course Code | Course Title | Credit Hours |
|---------------|--|--------------|
| CHEM 6506 | Coordination Chemistry | 3(3+0) |
| CHEM 6507 | Non-Spectroscopic Instrumental Methods of Analysis | 3(3+0) |
| CHEM 6508 | Basic Instrumental Methods of Analysis | 3(3+0) |
| CHEM 6509 | Advanced Inorganic Chemistry Lab-I | 3(3+0) |
| CHEM 6510 | Advanced Inorganic Chemistry Lab-II | 3(3+0) |
| Total Credits | | 15 |

Semester-8

| Course Code | Course Title | Credit Hours |
|---------------|---|--------------|
| CHEM 6521 | Organometallic Chemistry | 3(3+0) |
| CHEM 6522 | Group Theory for Chemist and Its Applications | 3(3+0) |
| CHEM 6523 | Advanced Environmental Chemistry | 3(3+0) |
| CHEM 6524 | Advanced Inorganic Chemistry Lab-III | 3(3+0) |
| CHEM 6525 | Advanced Inorganic Chemistry Lab-IV | 3(3+0) |
| Total Credits | | 15 |

Specialization (Physical Chemistry)**Semester-7**

| Course Code | Course Title | Credit Hours |
|---------------|------------------------------------|--------------|
| CHEM 6511 | Chemical Kinetics | 3(3+0) |
| CHEM 6512 | Quantum Chemistry | 3(3+0) |
| CHEM 6513 | Electrochemistry | 3(3+0) |
| CHEM 6514 | Advanced Physical Chemistry Lab-I | 3(3+0) |
| CHEM 6515 | Advanced Physical Chemistry Lab-II | 3(3+0) |
| Total Credits | | 15 |

Semester-8

| Course Code | Course Title | Credit Hours |
|-------------|------------------------|--------------|
| CHEM 6526 | Molecular Spectroscopy | 3(3+0) |

| | | |
|---------------|--|--------|
| CHEM 6527 | Chemical Thermodynamics | 3(3+0) |
| CHEM 6528 | Surface Chemistry | 3(3+0) |
| CHEM 6529 | Advanced Physical Chemistry Lab-III | 3(3+0) |
| CHEM 6530 | Advanced Physical Chemistry Lab-IV | 3(3+0) |
| Total Credits | | 15 |

Total Credit Hours=132

3.4 Fee Tariff

| | |
|-------------------------------|-------------------|
| Item | |
| Registration Fee: | Rs.550/- |
| Admission Fee: | Rs.1100/- |
| Technology Fee (per semester) | Rs.550/- |
| Course Code / Lab | Fee |
| BIO3501 | Rs.8800/- |
| CHEM3505 | Rs.8800/- |
| MATH3501 | Rs.6600/- |
| ENGL3501 | Rs.6600/- |
| PKST3501 | Rs.4400/- |
| Lab fee (per semester) | Rs.6600/- |
| First Semester Fee | Rs.43950/- |

5 BS Chemistry (2.5-year program)

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

1. Students holding a BSc degree 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 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) maximum duration to complete BS program 4 years (8 Semesters)

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

Semester-1 (Bridging Semester)

| Course Code | Course Title | Credit Hours |
|---------------|----------------------|--------------|
| CHEM3501 | Inorganic Chemistry | 4(3+1) |
| CHEM3502 | Organic Chemistry | 4(3+1) |
| CHEM3503 | Physical Chemistry | 4(3+1) |
| CHEM3504 | Analytical Chemistry | 3(2+1) |
| MATH3501 | Pre-Calculus | 3(3+0) |
| Total Credits | | 18 |

Semester-2

| Course Code | Course Title | Credit Hours |
|---------------|--------------------------|--------------|
| CHEM3506 | Analytical Chemistry-1 | 3(3+0) |
| CHEM3507 | Physical Chemistry-1 | 3(3+0) |
| CHEM3508 | Organic Chemistry -1 | 3(3+0) |
| CHEM3500 | Inorganic Chemistry-1 | 3(3+0) |
| CHEM3510 | Mathematics for Chemists | 2(2+0) |
| CHEM3511 | Chemistry Lab-I | 4(0+4) |
| Total Credits | | 18 |

Semester-3

| Course Code | Course Title | Credit Hours |
|---------------|-------------------------|--------------|
| CHEM3501 | Analytical Chemistry-II | 3(3+0) |
| CHEM3502 | Physical Chemistry-II | 3(3+0) |
| CHEM3503 | Organic Chemistry-II | 3(3+0) |
| CHEM3504 | Inorganic Chemistry-II | 3(3+0) |
| CHEM3505 | Chemistry Lab-II | 4(0+4) |
| Total Credits | | 16 |

Specialization (Organic Chemistry)**Semester-4**

| Course Code | Course Title | Credit Hours |
|-------------|--|--------------|
| CHEM6501 | Heterocyclic Chemistry | 3(3+0) |
| CHEM6502 | Stereochemistry of Organic Compounds | 3(3+0) |
| CHEM6503 | Spectroscopic Methods in Organic Chemistry | 3(3+0) |
| CHEM6504 | Advanced Organic Chemistry Lab-I | 3(3+0) |

| | | |
|---------------|-----------------------------------|--------|
| CHEM6505 | Advanced Organic Chemistry Lab-II | 3(3+0) |
| Total Credits | | 15 |

Semester- 5

| Course Code | Course Title | Credit Hours |
|---------------|------------------------------------|--------------|
| CHEM6516 | Chemistry of Natural Products | 3(3+0) |
| CHEM6517 | Special Organic Reactions | 3(3+0) |
| CHEM6518 | Organic Synthesis | 3(3+0) |
| CHEM6519 | Advanced Organic Chemistry Lab-III | 3(3+0) |
| CHEM6520 | Advanced Organic Chemistry Lab-IV | 3(3+0) |
| Total Credits | | 15 |

Specialization (Inorganic Chemistry / Analytical Chemistry)**Semester- 4**

| Course Code | Course Title | Credit Hours |
|---------------|--|--------------|
| CHEM6506 | Coordination Chemistry | 3(3+0) |
| CHEM6507 | Non-Spectroscopic Instrumental Methods of Analysis | 3(3+0) |
| CHEM6508 | Basic Instrumental Methods of Analysis | 3(3+0) |
| CHEM6509 | Advanced Inorganic Chemistry Lab-I | 3(3+0) |
| CHEM6510 | Advanced Inorganic Chemistry Lab-II | 3(3+0) |
| Total Credits | | 15 |

Semester-5

| Course Code | Course Title | Credit Hours |
|---------------|---|--------------|
| CHEM6521 | Organometallic Chemistry | 3(3+0) |
| CHEM6522 | Group Theory for Chemist and Its Applications | 3(3+0) |
| CHEM6523 | Advanced Environmental Chemistry | 3(3+0) |
| CHEM6524 | Advanced Inorganic Chemistry Lab-III | 3(3+0) |
| CHEM6525 | Advanced Inorganic Chemistry Lab-IV | 3(3+0) |
| Total Credits | | 15 |

Specialization (Physical Chemistry)**Semester-4**

| Course Code | Course Title | Credit Hours |
|---------------|------------------------------------|--------------|
| CHEM6511 | Chemical Kinetics | 3(3+0) |
| CHEM6512 | Quantum Chemistry | 3(3+0) |
| CHEM6513 | Electrochemistry | 3(3+0) |
| CHEM6514 | Advanced Physical Chemistry Lab-I | 3(3+0) |
| CHEM6515 | Advanced Physical Chemistry Lab-II | 3(3+0) |
| Total Credits | | 15 |

Semester-5

| Course Code | Course Title | Credit Hours |
|-------------|-------------------------|--------------|
| CHEM6526 | Molecular Spectroscopy | 3(3+0) |
| CHEM6527 | Chemical Thermodynamics | 3(3+0) |

| | | |
|---------------|-------------------------------------|--------|
| CHEM6528 | Surface Chemistry | 3(3+0) |
| CHEM6529 | Advanced Physical Chemistry Lab-III | 3(3+0) |
| CHEM6530 | Advanced Physical Chemistry Lab-IV | 3(3+0) |
| Total Credits | | 15 |

4.4 Fee Tariff

| Item | |
|-------------------------------|--------------------|
| Registration Fee: | Rs.550/- |
| Admission Fee: | Rs.1100/- |
| Technology Fee (per semester) | Rs.550/- |
| Course Code / Lab | Fee |
| CHEM3501 | Rs.8800/- |
| CHEM3502 | Rs.8800/- |
| CHEM3503 | Rs.8800/- |
| CHEM3504 | Rs.6600/- |
| MATH3501 | Rs.6600/- |
| Lab fee (per semester) | Rs.6600/- |
| First Semester Fee | Rs.484,00/- |

5 BS Chemistry (2-year program)

Eligibility Criteria for BS Programs (Ad Based in relevant field with at least 60 credit hours)

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

5.2 Duration of Program

The minimum duration of BS Chemistry Program is **2 years (4 Semesters), and maximum** duration to

complete BS Chemistry program is 4 years (8 semester)

5.3 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

Semester-1

| Course Code | Course Title | Credit Hours |
|---------------|--------------------------|--------------|
| 2573 | Analytical Chemistry-1 | 3(3+0) |
| 2575 | Physical Chemistry-1 | 3(3+0) |
| 2576 | Organic Chemistry -1 | 3(3+0) |
| 2577 | Inorganic Chemistry-1 | 3(3+0) |
| 2594 | Mathematics for Chemists | 2(2+0) |
| 2595 | Chemistry Lab-I | 4(0+4) |
| Total Credits | | 18 |

Semester-2

| Course Code | Course Title | Credit Hours |
|-------------|-------------------------|--------------|
| 2574 | Analytical Chemistry-II | 3(3+0) |
| 2580 | Physical Chemistry-1I | 3(3+0) |
| 2581 | Organic Chemistry-II | 3(3+0) |

| | | |
|---------------|------------------------|--------|
| 2582 | Inorganic Chemistry-II | 3(3+0) |
| 2596 | Chemistry Lab-II | 4(0+4) |
| Total Credits | | 16 |

Specialization (Organic Chemistry)

Semester-3

| Course Code | Course Title | Credit Hours |
|---------------|--|--------------|
| 2585 | Heterocyclic Chemistry | 3(3+0) |
| 2586 | Stereochemistry of Organic Compounds | 3(3+0) |
| 2589 | Spectroscopic Methods in Organic Chemistry | 3(3+0) |
| 2597 | Advanced Organic Chemistry Lab-I | 3(3+0) |
| 2598 | Advanced Organic Chemistry Lab-II | 3(3+0) |
| Total Credits | | 15 |

Semester- 4

| Course Code | Course Title | Credit Hours |
|---------------|------------------------------------|--------------|
| 2587 | Chemistry of Natural Products | 3(3+0) |
| 2590 | Special Organic Reactions | 3(3+0) |
| 2591 | Organic Synthesis | 3(3+0) |
| 2537 | Advanced Organic Chemistry Lab-III | 3(3+0) |
| 2538 | Advanced Organic Chemistry Lab-IV | 3(3+0) |
| Total Credits | | 15 |

Specialization (Inorganic Chemistry / Analytical Chemistry)

Semester- 3

| Course Code | Course Title | Credit Hours |
|-------------|------------------------|--------------|
| 2539 | Coordination Chemistry | 3(3+0) |

| | | |
|---------------|--|--------|
| 2540 | Non-Spectroscopic Instrumental Methods of Analysis | 3(3+0) |
| 2541 | Basic Instrumental Methods of Analysis | 3(3+0) |
| 2542 | Advanced Inorganic Chemistry Lab-I | 3(3+0) |
| 2543 | Advanced Inorganic Chemistry Lab-II | 3(3+0) |
| Total Credits | | 15 |

Semester-4

| Course Code | Course Title | Credit Hours |
|---------------|---|--------------|
| 2544 | Organometallic Chemistry | 3(3+0) |
| 2545 | Group Theory for Chemist and Its Applications | 3(3+0) |
| 2547 | Advanced Environmental Chemistry | 3(3+0) |
| 3561 | Advanced Inorganic Chemistry Lab-III | 3(3+0) |
| 3562 | Advanced Inorganic Chemistry Lab-IV | 3(3+0) |
| Total Credits | | 15 |

Specialization (Physical Chemistry)

Semester-3

| Course Code | Course Title | Credit Hours |
|---------------|------------------------------------|--------------|
| 2548 | Chemical Kinetics | 3(3+0) |
| 2549 | Quantum Chemistry | 3(3+0) |
| 2550 | Electrochemistry | 3(3+0) |
| 2568 | Advanced Physical Chemistry Lab-I | 3(3+0) |
| 2569 | Advanced Physical Chemistry Lab-II | 3(3+0) |
| Total Credits | | 15 |

Semester-4

| Course Code | Course Title | Credit Hours |
|---------------|-------------------------------------|--------------|
| 2570 | Molecular Spectroscopy | 3(3+0) |
| 2571 | Chemical Thermodynamics | 3(3+0) |
| 2599 | Surface Chemistry | 3(3+0) |
| 3563 | Advanced Physical Chemistry Lab-III | 3(3+0) |
| 3564 | Advanced Physical Chemistry Lab-IV | 3(3+0) |
| Total Credits | | 15 |

5.4 Fee Tariff

| Item | |
|-------------------------------|--------------------|
| Registration Fee: | Rs.550/- |
| Admission Fee: | Rs.1100/- |
| Technology Fee (per semester) | Rs.550/- |
| Course Code / Lab | Fee |
| Analytical Chemistry-1 | Rs.6600/- |
| Physical Chemistry-1 | Rs.6600/- |
| Organic Chemistry -1 | Rs.6600/- |
| Inorganic Chemistry-1 | Rs.6600/- |
| Mathematics for Chemists | Rs.4400/- |
| Lab fee (per semester) | Rs.6600/- |
| First Semester Fee | Rs.39,600/- |

6 Mode of Study

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

Student progress will be assessed based on the followings:

Continuous Assessment

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.

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.

Final Examinations

A written examination will be conducted for

each course with 50% passing marks.

Method of Assessment for Laboratory Courses.

Assessment for all laboratory courses will be totally based on continuous assessment, Lab Quiz and Viva-voce as already mentioned, the laboratory courses will be offered in the form of workshops. A specific number of experiments will be conducted in each workshop. Each experiment will be assessed separately, and attendance in these workshops will be compulsory for every student. The minimum required marks to pass each laboratory course will be 50%.

7 Guidelines for Online Application

Applying/Admission Procedure

- 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. Fill login details and login to the portal
- vi. After login click on Step-1 and complete your profile. Note: All tabs should be filled before applying for admissions.
- vii. After completion of Step-1, click on Step-2 then click on "Download Challan" against program (s) you wish to apply.
- viii. Pay the *admission form fee* as per AIOU prescribed criteria through selected bank branches or online payment methods.

- ix. After admission fee confirmation, you will be called on through SMS to visit the department for the verification of your credentials.
- x. After the verification, you will be informed whether you are eligible for the admission in BS Program or not.
- xi. Incomplete forms shall not be entertained.
- xii. Only selected candidates will be asked to deposit semester after verification of original documents.
- xiii. The fee should not be submitted before the confirmation of admission.
- xiv. The deposited fee will not be refundable or adjustable for future admission.

8 Contact Details

Chairperson

Department of Chemistry,
Science Block

Allama Iqbal Open University, H-8, Islamabad.

Contact Ph: 051-9057818

BS Programme Coordinator

Department of Chemistry,
Science Block

Allama Iqbal Open University, H-8, Islamabad.

Contact Ph: 051-9057262

9. Faculty Members

1. Dr. Uzma Yunus

Associate Professor /Chairperson

Ph: 051-9575200

2. Dr. Moazzam H. Bhatti

Professor

Ph: 051-9575217

3. Dr. Nasima Arshad

Associate Professor

Ph: 051-9575218

4. Dr. Muhammad Sher

Associate Professor

Ph: 051-9575219

5. Dr. Muhammad Zaman Ashraf

Assistant Professor

Ph: 051-9575224

6. Dr. Iqbal Ahmed

Assistant Professor

Ph: 051-9575223

7. Dr. Muhammad Naeem Khan

Assistant Professor

Ph: 051-9575225

8. Dr. Muhammad Saleem

Assistant Professor

Ph: 051-9575226

9. Dr. Mehwash Zia

Lecturer

Ph: 051-9575231

10. Dr. Farzana Shaheen

Lecturer

Ph: 051-9575232

11. Dr. Erum Jabeen

Lecturer

Ph: 051-9575234

DEPARTMENT OF MATHEMATICS

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

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

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

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

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

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

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

BS MATHEMATICS

1. Introduction

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

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

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

2. Objectives

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

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

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

3. BS Mathematics (4-Year Program)

▪ Eligibility Criteria

Candidate must have at least 33% marks in HSSC (major in 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 130 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

| Semester 1 | | |
|-------------|--|--------------|
| Course Code | Course Title | Credit Hours |
| ENGL3501 | English-I: Composition and Comprehension | 3(3+0) |
| MATH3502 | Calculus-I | 3(3+0) |
| PKST3501 | Pakistan Studies | 2(2+0) |
| CS3501 | Introduction to Computer | 3(3+0) |
| STAT3501 | Introductory Statistics | 3(3+0) |
| MATH3507 | Set Theory and Logic | 3(3+0) |
| | Total Credits | 17 |

| Semester 2 | | |
|--------------------|--|---------------------|
| Course Code | Course Title | Credit Hours |
| ENGL3503 | English-II: Technical and Business Writing | 3(3+0) |
| MATH3509 | Calculus-II | 3(3+0) |
| ITHC3501 /HADH3501 | Islamic Studies/Ethics | 2(2+0) |
| MATH3505 | Discrete Mathematics-I | 3(3+0) |
| ENVS3502 | Fundamentals of Environmental Sciences | 3(3+0) |
| SOC3502 | Introduction to Sociology | 3(3+0) |
| | Total credits | 17 |

| Semester 3 | | |
|--------------------|-----------------------------------|---------------------|
| Course Code | Course Title | Credit Hours |
| ENGL3502 | English-III: Communication Skills | 3(3+0) |
| PHY3509 | Waves and Oscillations | 3(3+0) |
| MATH4501 | Algebra-I | 3(3+0) |
| MATH4502 | Analytical Geometry | 3(3+0) |
| MATH4503 | Vector and Tensor Analysis | 3(3+0) |
| URD3501 | Pakistani Adab-I | 3(3+0) |
| | Total Credits | 18 |

| Semester 4 | | |
|--------------------|---|---------------------|
| Course Code | Course Title | Credit Hours |
| STAT3503 | Introduction to Probability and Probability Distributions | 3(3+0) |

| | | |
|---------------|----------------------------------|-----------|
| PHY3507 | Heat and Thermodynamics | 3(3+0) |
| MATH4504 | Mathematical Methods | 3(3+0) |
| ITHC3502/9474 | Language Arabic/French Level - I | 3(3+0) |
| MATH3506 | Computing Tools | 3(2+1) |
| | Total Credits | 15 |

| Semester 5 | | |
|--------------------|--|---------------------|
| Course Code | Course Title | Credit Hours |
| MATH3510 | Computer and Scientific Applications C++ | 3(2+1) |
| MATH3511 | Topology | 3(3+0) |
| MATH3512 | Linear Algebra | 3(3+0) |
| MATH3513 | Real Analysis-I | 3(3+0) |
| MATH3514 | Ordinary Differential Equations | 3(3+0) |
| | Total Credits | 15 |

| Semester 6 | | |
|--------------------|-----------------------|---------------------|
| Course Code | Course Title | Credit Hours |
| MATH5501 | Differential Geometry | 3(3+0) |
| MATH5502 | Complex Analysis | 3(3+0) |
| MATH5503 | Group Theory | 3(3+0) |
| MATH5504 | Analytical Mechanics | 3(3+0) |
| MATH5505 | Real Analysis-II | 3(3+0) |
| MATH5506 | Algebra-II | 3(3+0) |
| | Total Credits | 18 |

| Semester 7 | | |
|----------------------|--------------------------------|--------------|
| Course Code | Course Title | Credit Hours |
| MATH6501 | Numerical Methods | 3(2+1) |
| MATH6502 | Partial Differential Equations | 3(3+0) |
| MATH6503 | Functional Analysis | 3(3+0) |
| MATH6504 | Theory of Rings | 3(3+0) |
| STAT3504 | Mathematical Statistics-I | 3(3+0) |
| Total Credits | | 15 |

| Semester 8 | | |
|----------------------|--------------|--------------|
| Course Code | Course Title | Credit Hours |
| | Optional-I | 3(3+0) |
| | Optional-II | 3(3+0) |
| | Optional-III | 3(3+0) |
| | Optional-IV | 3(3+0) |
| | Optional-V | 3(3+0) |
| Total credits | | 15 |

Total Credits =130

▪ **Fee Tariff**

| Item | |
|---|-------------|
| Registration Fee (Once at time of admission) | Rs.550/- |
| Admission Fee (Once at time of admission) | Rs.1100/- |
| Technology Fee | Rs.550/- |
| Per 3 Credit hours course fee: Rs. 6000 | Rs. 33000 |
| Per 2 Credit hours course fee: Rs. 4000 | Rs.4400/- |
| Lab Fee (Per Semester) | Rs.850/- |
| Total | Rs. 40450/- |

4. BS Mathematics (2.5-Year Program)

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

1. Students holding a BSc degree 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 another discipline shall also be eligible for admission.

▪ **Duration of Program**

In order to be eligible for the award of BS in Mathematics, the student will have to earn a total of 131 (50+81) credit hours within a minimum period of 2.5 years (5 semesters). 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 81 credit hours= within a minimum period of 2.5 years (5 semesters) and maximum period of 4.5 years (9 semesters)

▪ **Scheme of Study**

| Semester-1 (Bridging Semester) | | |
|--------------------------------|---------------------------|--------------|
| Course Code | Course Title | Credit Hours |
| CS3501 | Introduction to Computers | 3(3+0) |

| | | |
|----------|-------------------------|-----------|
| STAT3501 | Introductory Statistics | 3(3+0) |
| MATH3507 | Set Theory and Logic | 2(2+0) |
| MATH3505 | Discrete Mathematics-I | 3(3+0) |
| MATH3506 | Computing Tools | 3(3+0) |
| PHY3507 | Heat and Thermodynamics | 3(3+0) |
| | Total Credits | 18 |

| Semester 2 | | |
|-------------|--|--------------|
| Course Code | Course Title | Credit Hours |
| MATH3510 | Computer and Scientific Applications C++ | 3(2+1) |
| MATH3511 | Topology | 3(3+0) |
| MATH3512 | Linear Algebra | 3(3+0) |
| MATH3513 | Real Analysis-I | 3(3+0) |
| MATH3514 | Ordinary Differential Equations | 3(3+0) |
| | Total Credits | 15 |

| Semester 3 | | |
|-------------|-----------------------|--------------|
| Course Code | Course Title | Credit Hours |
| MATH5501 | Differential Geometry | 3(3+0) |
| MATH5502 | Complex Analysis | 3(3+0) |
| MATH5503 | Group Theory | 3(3+0) |
| MATH5504 | Analytical Mechanics | 3(3+0) |
| MATH5505 | Real Analysis-II | 3(3+0) |
| MATH5506 | Algebra-II | 3(3+0) |
| | Total Credits | 18 |

| Semester 4 | | |
|-------------|--------------------------------|--------------|
| Course Code | Course Title | Credit Hours |
| MATH6501 | Numerical Methods | 3(2+1) |
| MATH6502 | Partial Differential Equations | 3(3+0) |
| MATH6503 | Functional Analysis | 3(3+0) |
| MATH6504 | Theory of Rings | 3(3+0) |
| STAT3504 | Mathematical Statistics-I | 3(3+0) |
| | Total Credits | 15 |

| Semester 5 | | |
|-------------|----------------------|--------------|
| Course Code | Course Title | Credit Hours |
| | Optional-I | 3(3+0) |
| | Optional-II | 3(3+0) |
| | Optional-III | 3(3+0) |
| | Optional-IV | 3(3+0) |
| | Optional-V | 3(3+0) |
| | Total credits | 15 |

Total Credits =81

▪ **Fee Tariff**

| Item | |
|---|-------------|
| Registration Fee (Once at time of admission) | Rs.550/- |
| Admission Fee (Once at time of admission) | Rs.1100/- |
| Technology Fee | Rs.550/- |
| Per 3 Credit hours course fee: Rs. 6000 | Rs. 37400 |
| Lab Fee (Per Semester) | Rs.850/- |
| Total | Rs. 40450/- |

5. BS Mathematics (2-Year Program)

Eligibility Criteria for BS Programs (Ad Based in relevant field with at least 60 credit hours)

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

▪ Duration of Program

In order to be eligible for the award of BS in Mathematics, the student will have to earn a total 121 (60+63) credit hours with a minimum period of 2 years (4 Semester) and maximum period of 4 years (8 semester).

▪ Scheme of Study

| Semester 1 | | |
|-------------|--|--------------|
| Course Code | Course Title | Credit Hours |
| MATH3510 | Computer and Scientific Applications C++ | 3(2+1) |
| MATH3511 | Topology | 3(3+0) |
| MATH3512 | Linear Algebra | 3(3+0) |
| MATH3513 | Real Analysis-I | 3(3+0) |
| MATH3514 | Ordinary Differential Equations | 3(3+0) |
| | Total Credits | 15 |

| Semester 2 | | |
|-------------|-----------------------|--------------|
| Course Code | Course Title | Credit Hours |
| MATH5501 | Differential Geometry | 3(3+0) |

| | | |
|----------|----------------------|-----------|
| MATH5502 | Complex Analysis | 3(3+0) |
| MATH5503 | Group Theory | 3(3+0) |
| MATH5504 | Analytical Mechanics | 3(3+0) |
| MATH5505 | Real Analysis-II | 3(3+0) |
| MATH5506 | Algebra-II | 3(3+0) |
| | Total Credits | 18 |

| Semester 3 | | |
|-------------|--------------------------------|--------------|
| Course Code | Course Title | Credit Hours |
| MATH6501 | Numerical Methods | 3(2+1) |
| MATH6502 | Partial Differential Equations | 3(3+0) |
| MATH6503 | Functional Analysis | 3(3+0) |
| MATH6504 | Theory of Rings | 3(3+0) |
| STAT3504 | Mathematical Statistics-I | 3(3+0) |
| | Total Credits | 15 |
| Semester 4 | | |
| Course Code | Course Title | Credit Hours |
| | Optional-I | 3(3+0) |
| | Optional-II | 3(3+0) |
| | Optional-III | 3(3+0) |
| | Optional-IV | 3(3+0) |
| | Optional-V | 3(3+0) |
| | Total credits | 15 |

Total Credits =63

▪ **Fee Tariff**

| | |
|---|-------------|
| Item | |
| Registration Fee (Once at time of admission) | Rs.550/- |
| Admission Fee (Once at time of admission) | Rs.1100/- |
| Technology Fee | Rs.550/- |
| Per 3 Credit hours course fee: Rs. 6000 | Rs. 33000 |
| Lab Fee (Per Semester) | Rs.850/- |
| Total | Rs. 36050/- |

6. **Mode of Study**

Medium of Instruction

The Medium of Instructions for BS Mathematics will be English.

▪ **Study Material**

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

▪ **Mode of Teaching**

The classes will be conducted face-to-face in the main campus of AIOU. **Assessment and Evaluation**

Student progress will be assessed based on the followings:

Continuous Assessment

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.

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.

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.

7. Guidelines for Online Application

- i. Visit AIOU Website: www.aiou.edu.pk
- ii. Click OAS (Online Admission System) for Fresh Admission
- iii. Click 'Register' & fill details
- iv. Upon successful registration please click on login
- v. Fill login details and login to the portal
- vi. After login click on Step-1 and complete your profile.
Note: All tabs should be filled before applying for admissions.
- vii. After completion of Step-1, click on Step-2 then click on "Download Challan" against programme (s) you wish to apply.

- viii. Pay the *admission form fee* as per AIOU prescribed criteria through selected bank branches or online payment methods.
- ix. After admission fee confirmation, you will be called through SMS to visit the department for verification of your credentials.
- x. After document verification, you will be informed whether you are eligible for the admission in BS Programme or not.

In case a selected candidate fails to submit fee in time, the department may reserve the right to invite a candidate in waiting list for admission against vacant seat.

Contact Details

For further information, contact:

- i. Chairman**
Department of Mathematics
Faculty of Sciences, Block # 7,
Allama Iqbal Open University
Phone: 051-9575700
- ii. Coordinator BS-Mathematics**
Department of Mathematics,
Faculty of Sciences, Block # 7
Allama Iqbal Open University
Phone: 051-9575732
Email: bismah.jamil@aiou.edu.pk
- 9. Faculty Members**
 - 1. **Dr. Nasir Rehman**
Associate Professor

- Chairman, Department of Mathematics
Ph. 051-9575700
- 2. **Dr. Zahid Iqbal**
Associate Professor
Ph. 051-957571
- 3. **Dr. Irfan Mustafa**
Assistant Professor
Ph. 051-9575723
- 4. **Dr. Muhammad Nazam**
Lecturer
Ph. 051-9575731
- 5. **Dr. Bismah Jamil**
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

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 with minimum 33% marks or 2nd division.

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)**.

3.3. Scheme of Studies

| Semester-1 | | |
|-------------|--|--------------|
| Course Code | Course | Credit Hours |
| ENGL3501 | English-I: Composition & Comprehension | 3(3+0) |

| PKST 3501 | Pakistan Studies | 2(2+0) |
|-----------------------|--|--------------|
| PHY3503 | Basic Calculus-I | 3(3+0) |
| CS3501 | Introduction to Computers | 3(3+0) |
| PHY3501 | Mechanics | 4(3+1) |
| PHY3501 | Laboratory for Mechanics & Fluids | 1(0+1) |
| SOC3501 | Introduction to Sociology | 3(3+0) |
| | Total Credit hours | 19 |
| Semester-2 | | |
| Course Code | Course | Credit Hours |
| PHY3510 | Basic Calculus-II | 3(3+0) |
| ENGL3503 | English-II: Technical & Business Writing | 3(3+0) |
| PHY3505 | Electricity & Magnetism | 4(3+1) |
| PHY3508 | Laboratory for Electricity & Magnetism | 1(0+1) |
| PHY3509 | Waves & Oscillations | 3(3+0) |
| ITHC3501/H ADH3501 | Islamic Studies or Ethics (for non-Muslim students only) | 2(2+0) |
| PHY3511 | Laboratory Techniques and Error Propagation | 3(3+0) |
| | Total Credit hours | 19 |
| Semester-3 | | |
| Course Code | Course | Credit Hours |
| MATH3504 | Algebra in Physics | 3(3+0) |
| ENG3502 | English-III: Communication Skills | 3(3+0) |

| | | |
|--------------------|--|---------------------|
| STAT3505 | Fundamentals of Statistics | 3(3+0) |
| PHY3507 | Heat and Thermodynamics | 3(3+0) |
| MCM3501 | Mass Communication Skills | 3(3+0) |
| PHY4501 | Laboratory for Thermodynamics | 1(0+1) |
| | Total Credit hours | 16 |
| Semester-4 | | |
| Course Code | Course | Credit Hours |
| PHY3504 | Modern Physics | 3(3+0) |
| MATH3503 | Differential Equations | 3(3+0) |
| PH4502Y | Probability & Statistics | 3(3+0) |
| PHY3506 | Optics | 3(3+0) |
| PHY4503 | Laboratory for Optics & Spectroscopy | 1(0+1) |
| ENVS3502 | Fundamentals of Environmental Sciences | 3(3+0) |
| | Total Credit hours | 16 |
| Semester-5 | | |
| Course Code | Course | Credit Hours |
| PHY3512 | Mathematical Methods in Physics-1 | 3(3+0) |
| PHY3513 | Classical Mechanics & Relativity | 3(3+0) |
| PHY3516 | Electronics | 3(3+0) |
| PHY3515 | Atomic & Molecular Physics | 3(3+0) |
| PHY3514 | Laboratory for General & Nuclear Physics | 2(0+2) |
| PHY35 | Total Credit hours | 14 |

| | | |
|--------------------|--|---------------------|
| Semester-6 | | |
| Course Code | Course | Credit Hours |
| PHY5501 | Mathematical Methods in Physics-II | 3(3+0) |
| PHY5502 | Quantum Mechanics-I | 3(3+0) |
| PHY5503 | Electromagnetic Theory-I | 3(3+0) |
| PHY5506 | Thermal & Statistical Physics | 3(3+0) |
| PHY5505 | Computational Physics | 3(3+0) |
| PHY5504 | Laboratory for Electronics | 2(0+2) |
| | Total Credit hours | 17 |
| Semester-7 | | |
| Course Code | Course | Credit Hours |
| PHY6501 | Electromagnetic Theory-II | 3(3+0) |
| PHY6502 | Quantum Mechanics-II | 3(3+0) |
| PHY6503 | Solid State Physics-I | 3(3+0) |
| PHY6504 | Lasers & Optics | 3(3+0) |
| PHY6505 | Digital & Computer Hardware Electronics | 3(3+0) |
| PHY6506 | Laboratory for Digital & Computer Hardware Electronics | 3(0+3) |
| | Total Credit hours | 18 |
| Semester-8 | | |
| Course Code | Course | Credit Hours |
| PHY6507 | Research Techniques | 3(3+0) |
| PHY6508 | Nuclear Physics | 3(3+0) |

| | | |
|---------------------------|---|-----------|
| PHY6509 | Advanced Digital & Computer Hardware Electronics | 3(3+0) |
| PHY6510 | Laboratory for Advanced Digital & Computer Hardware Electronics | 4(0+4) |
| PHY6511 | Electronic Communication System | 3(3+0) |
| Total Credit hours | | 16 |

Total Credit Hours = 135

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

| Item | |
|---|------------|
| Registration Fee (Once at time of admission) | Rs.550/- |
| Admission Fee (Once at time of admission) | Rs.1100/- |
| Technology Fee | Rs.550/- |
| Tuition Fee (Rs. 2200/- per credit hour) | Rs.41800/- |
| Total | Rs.43950/- |

4. BS Physics (2.5- year)

The bridging semester will be offered for B.Sc (14 years of education) students, so that they may be allowed to continue with students of BS Physics 4- year program in 5th semester after completing a bridging semester comprising (18 credit hours) of foundation courses.

4.1. Eligibility Criteria

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

1. Students holding a BSc degree 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 another 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 five years (10 semesters).

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

| Semester-1 (Bridging Semester) | | |
|--------------------------------|--|--------------|
| Course Code | Course | Credit Hours |
| MATH 3504 | Algebra in Physics | 3(3+0) |
| ENGL3502 | English-III: Communication Skills | 3(3+0) |
| PHY3504 | Modern Physics | 3(3+0) |
| MATH3503 | Differential Equations | 3(3+0) |
| PHY3506 | Optics | 3(3+0) |
| ENVS3502 | Fundamentals of Environmental Sciences | 3(3+0) |
| Total Credit Hours | | 18 |
| Semester-2 | | |
| Course Code | Course | Credit Hours |
| PHY3512 | Mathematical Methods in | 3(3+0) |

| | | |
|--------------------|--|---------------------|
| | Physics-1 | |
| PHY3513 | Classical Mechanics & Relativity | 3(3+0) |
| PHY3516 | Electronics | 3(3+0) |
| PHY3515 | Atomic & Molecular Physics | 3(3+0) |
| PHY3514 | Laboratory for General & Nuclear Physics | 2(0+2) |
| | Total Credit Hours | 14 |
| Semester-3 | | |
| Course Code | Course | Credit Hours |
| PHY5501 | Mathematical Methods in Physics-II | 3(3+0) |
| PHY5502 | Quantum Mechanics-I | 3(3+0) |
| PHY5503 | Electromagnetic Theory-I | 3(3+0) |
| PHY5506 | Thermal & Statistical Physics | 3(3+0) |
| PHY5505 | Computational Physics | 3(3+0) |
| PHY5504 | Laboratory for Electronics | 2(0+2) |
| | Total Credit Hours | 17 |
| Semester-4 | | |
| Course Code | Course | Credit Hours |
| PHY6501 | Electromagnetic Theory – II | 3(3+0) |
| PHY6502 | Quantum Mechanics-II | 3(3+0) |
| PHY6503 | Solid State Physics -I | 3(3+0) |
| PHY6504 | Lasers & Optics | 3(3+0) |
| PHY6505 | Digital & Computer Hardware | 3(3+0) |

| | | |
|--------------------|---|---------------------|
| | Electronics | |
| PHY6506 | Laboratory for Digital & Computer Hardware Electronics | 3(0+3) |
| | Total Credit Hours | 18 |
| Semester-5 | | |
| Course Code | Course | Credit Hours |
| PHY6507 | Research Techniques | 3(3+0) |
| PHY6508 | Nuclear Physics | 3(3+0) |
| PHY6509 | Advanced Digital & Computer Hardware Electronics | 3(3+0) |
| PHY6510 | Laboratory for Advanced Digital & Computer Hardware Electronics | 4(0+4) |
| PHY6511 | Electronic Communication System | 3(3+0) |
| | Total Credit Hours | 16 |

Total Credit Hours = 83

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

| Item | |
|---|-------------|
| Registration Fee (Once at time of admission) | Rs.550/- |
| Admission Fee (Once at time of admission) | Rs.1100/- |
| Technology Fee | Rs.550/- |
| Tuition Fee (Rs. 2000/- per credit hour) | Rs.39600/- |
| Total | Rs. 41800/- |

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

5. BS Physics (2-year)

Eligibility Criteria for BS Programs (Ad Based in relevant field with at least 60 credit hours)

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

5.2. Duration of Program

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

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

| Semester-1 | | |
|-------------|--|--------------|
| Course Code | Course | Credit Hours |
| 751 | Mathematical Methods in Physics-1 | 3(3+0) |
| 752 | Classical Mechanics & Relativity | 3(3+0) |
| 2564 | Electronics | 3(3+0) |
| 2551 | Atomic & Molecular Physics | 3(3+0) |
| 766 | Laboratory for General & Nuclear Physics | 2(0+2) |
| | Total Credit Hours | 14 |
| Semester-2 | | |
| Course Code | Course | Credit Hours |
| 755 | Mathematical Methods in Physics-II | 3(3+0) |

| 756 | Quantum Mechanics-I | 3(3+0) |
|-------------|--|--------------|
| 765 | Electromagnetic Theory-I | 3(3+0) |
| 2566 | Thermal & Statistical Physics | 3(3+0) |
| 769 | Computational Physics | 3(3+0) |
| 762 | Laboratory for Electronics | 2(0+2) |
| | Total Credit Hours | 17 |
| Semester-3 | | |
| Course Code | Course | Credit Hours |
| 2565 | Electromagnetic Theory-II | 3(3+0) |
| 759 | Quantum Mechanics-II | 3(3+0) |
| 761 | Solid State Physics-I | 3(3+0) |
| 758 | Lasers & Optics | 3(3+0) |
| 2553 | Digital & Computer Hardware Electronics | 3(3+0) |
| 2556 | Laboratory for Digital & Computer Hardware Electronics | 3(0+3) |
| | Total Credit Hours | 18 |
| Semester-4 | | |
| Course Code | Course | Credit Hours |
| 5464 | Research Techniques | 3(3+0) |
| 760 | Nuclear Physics | 3(3+0) |
| 2560 | Advanced Digital & Computer Hardware Electronics | 3(3+0) |
| 2561 | Laboratory for Advanced Digital & | 4(0+4) |

| | | |
|------|---------------------------------|-----------|
| | Computer Hardware Electronics | |
| 2559 | Electronic Communication System | 3(3+0) |
| | Total Credit Hours | 16 |

Total Credit Hours = 65

5.4. Fee Tariff for 1st Semester

| Item | |
|---|-------------|
| Registration Fee (Once at time of admission) | Rs.550/- |
| Admission Fee (Once at time of admission) | Rs.1100/- |
| Technology Fee | Rs.550/- |
| Tuition Fee (Rs. 2000/- per credit hour) | Rs.20800/- |
| Total | Rs. 33000/- |

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

6. Mode of Study

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

- d) University will provide opportunities face to face teaching to the students.
- e) The schedule of classes and dates of submission of assignments/tests/quizzes/presentations will be announced by the department.

6.4 Assessment and Evaluation

For each course the student's progress will be assessed based on the following:

6.4.1 Continuous Assessment

Student performance is evaluated / assessed as under:

Class assignment through quiz/sessional test/assignment weightage = 20%

The pass percentage in quiz/sessional test/assignment will be 50%. Laboratory courses will purely be evaluated based on continuous assessment.

70% of attendance for all Theory Courses and 80% for laboratory courses is compulsory.

Weightage of attendance for theory courses = 10%

6.4.2 Final Examinations

Final Paper weightage = 70%

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

7 Guidelines for Online Application

- i. Visit AIOU Website: www.aiou.edu.pk
- ii. Click OAS (Online Admission System) for Fresh Admission
- iii. Click 'Register' & fill details
- iv. Upon successful registration please click on login
- v. Fill login details and login to the portal

- vi. After login click on Step-1 and complete your profile.
- Note:** All tabs should be filled before applying for admissions.
- vii. After completion of Step-1, click on Step-2 then click on "Download Challan" against program (s) you wish to apply.
- viii. Pay the *admission form fee* as per AIOU prescribed criteria through selected bank branches or online payment methods.
- ix. After admission fee confirmation, you will be called through SMS to visit the department for verification of your credentials.
- x. After document verification, you will be informed whether you are eligible for the admission in BS Program or not.

In case a selected candidate fails to submit fee in time, the department may reserve the right to invite a candidate in waiting list for admission against vacant seat.

8 Contact Details

Chairperson

Department of Physics,
New Science Block
Allama Iqbal Open University, H-8, Islamabad.
Contact Ph: 051-9057728
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BS Program Coordinator

Department of Physics,
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Allama Iqbal Open University, H-8, Islamabad.
Contact Ph: 051-9575426

Email: tariq.jan@aiou.edu.pk

9 Faculty Members

1. Dr. Syed Raza Ali Raza

Associate Professor / Chairman
Ph: 051-9575418

2. Dr. Surayya Mukhtar

Assistant Professor
Ph: 051-9575423

3. Mr. Ather Hassan

Assistant Professor
Ph: 051-9575425

4. Dr. Muhammad Tariq Jan

Assistant Professor
Ph: 051-9575426

5. Dr. Abdul Jalil

Assistant Professor
Ph: 051-9575424

6. Dr. Zulfiqar Ali Shah

Assistant Professor
Ph: 051-9575427

7. Ms. Hareem Mufti

Lecturer
Ph: 051-9575433

8. Dr. Uzma Nosheen

Lecturer
Ph: 051-9057225

9. Dr. Tayyaba Aftab

Lecturer
Ph: 051-9575431

DEPARTMENT OF STATISTICS

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

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

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

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

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

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

BS STATISTICS PROGRAM

1. Introduction

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

2. Objectives

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

3. BS Statistics (4-Year Program)

3.1 Eligibility Criteria

Candidate must have at least 2nd division or 33% marks in 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 degree, the student will have to qualify the 130 credit hours consisting 44 courses withing a minimum period of eight semesters (4 years) and maximum period of 12 semesters (6 years)

Access to B.Sc./AD students in BS 4 years Statistics program (5th Semester)

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

1. Students holding a BSc degree 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 another discipline shall also be eligible for admission.

Eligibility Criteria (ADS Students only)

Eligibility Criteria for BS Programs (Ad Based in relevant field with at least 60 credit hours)

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

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, Autumn 2023

Semester 1

| Course Code | Course Title | Credit Hours |
|-------------|--|--------------|
| 5451 | English-I: Composition and Comprehension | 3(3+0) |
| 5465 | Pakistan Studies | 2(2+0) |

| | | |
|------|--------------------------|---------------|
| 4432 | Calculus-I | 3(3+0) |
| 5468 | Introduction to computer | 3(3+0) |
| 4434 | Introductory Statistics | 3(3+0) |
| 9424 | Quantitative Reasoning | <u>3(3+0)</u> |
| | | 17 |

Semester 2

| Course Code | Course Title | Credit Hours |
|-------------|---|---------------|
| 5454 | English-II: Technical and Business Writing | 3(3+0) |
| 5466/5467 | Islamic Studies/ Ethics (Non-Muslims) | 2(2+0) |
| 4433 | Calculus-II | 3(3+0) |
| 4486 | Introduction to Regression and Time Series Analysis | 3(3+0) |
| 5474 | Fundamentals of Environmental Sciences | 3(3+0) |
| 5469 | Introduction to Sociology | <u>3(3+0)</u> |
| | | 17 |

Semester 3

| Course Code | Course Title | Credit Hours |
|-------------|-----------------------------------|---------------|
| 5458 | English-III: Communication Skills | 3(3+0) |
| 9466 | Pakistani Adab-I | 3(3+0) |
| 9469 | Population Studies | 3(3+0) |
| 4472 | Algebra-I | 3(3+0) |
| 5471 | Mass Communication | 3(3+0) |
| 4491 | Basic Statistical Inference | <u>3(3+0)</u> |
| | | 18 |

Semester 4

| Course Code | Course Title | Credit Hours |
|-------------|--|---------------|
| 4489 | Introduction to Probability & Probability Distributions. | 3(3+0) |
| 4492 | Official Statistics | 3(3+0) |
| 4493 | Basics Designs of Experiments | 3(3+0) |
| 9471 | Human Resource Management | 3(3+0) |
| 9473 | Arabic Language | 3(3+0) |
| 4477 | Computing Tools | <u>3(3+0)</u> |
| | | 18 |

Semester 5

| Course Code | Course Title | Credit Hours |
|-------------|---|---------------|
| 1551 | Statistical Methods | 3(3+0) |
| 1552 | Sampling Techniques-I | 3(3+0) |
| | Design and Analysis of Experiments-I | 3(3+0) |
| 1553 | Experiments-I | |
| 1554 | Probability & Probability Distributions-I | 3(3+0) |
| 1555 | Advanced Calculus | <u>3(3+0)</u> |
| | | 15 |

Semester 6

| Course Code | Course Title | Credit Hours |
|-------------|---|--------------|
| 1513 | Non-Parametric Methods | 3(3+0) |
| | Probability & Probability Distributions -II | 3(3+0) |
| 1556 | Regression Analysis | 3(3+0) |
| 1557 | Sampling Techniques -II | 3(3+0) |

| | | |
|------|------------------------|--------|
| 1558 | Design and Analysis of | 3(3+0) |
| 1559 | Experiments-II | 15 |

Semester 7

| Course Code | Course Title | Credit Hours |
|-------------|-------------------------------------|--------------|
| 1514 | Mathematical Methods for Statistics | 3(3+0) |
| | Statistical Inference-Estimation | 3(3+0) |
| 1561 | Econometrics | |
| 1562 | Total Quality Management | 3(3+0) |
| 1563 | | 3(3+0) |
| 1564 | Computer Programming (C & C++) | 3(3+0) |
| | | 15 |

Semester 8

| Course Code | Course Title | Credit Hours |
|-------------|---|--------------|
| 1566 | Statistical Inference-Testing of Hypothesis | 3(3+0) |
| 1567 | Applied Multivariate Analysis | 3(3+0) |
| 1569 | Data Analysis and Statistical Packages | 3(3+0) |
| | Elective-I | 3(3+0) |
| | Elective-II | 3(3+0) |
| | | 15 |

List of Elective Courses

| Sr. No. | Course Title | Course Code | Credit Hours |
|---------|----------------------|-------------|--------------|
| 1571 | Reliability Analysis | 1571 | 3(3+0) |
| 1572 | Data Mining | 1572 | 3(3+0) |
| 1573 | Bayesian Statistics | 1573 | 3(3+0) |

| | | | |
|------|----------------------|------|--------|
| 1574 | Biostatistics | 1574 | 3(3+0) |
| 1568 | Operations Research | 1568 | 3(3+0) |
| 1570 | Research Methodology | 1570 | 3(3+0) |

Bridging semester for BSc/ADS Statistics

| Bridging Semester | | |
|-------------------|--------------------------|---------|
| Code | Course | CH |
| 9472 | Business Communication | 3 (3+0) |
| 1417 | Statistics-I | 3 (3+0) |
| 1418 | Statistics-II | 3 (3+0) |
| 1419 | Statistics-III | 3 (3+0) |
| 1420 | General Mathematics | 3 (3+0) |
| 5468 | Introduction to Computer | 3 (3+0) |
| | Total Credits | 18 |

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.550/- |
| Admission Fee: | Rs.1100/- |
| Technology Fee (per semester): | Rs.550/- |
| Course Code | Fee |
| 5468 | Rs.6600/- |
| 4432 | Rs.6600/- |
| 4434 | Rs.6600/- |
| 5465 | Rs.4400/- |
| 5451 | Rs.6600/- |
| 9424 | Rs.6600/- |
| Lab fee (per semester) | Rs.850/- |
| Total Semester Fee | Rs.40450/- |

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

6. Mode of Study

6.1 Medium of Instruction

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

6.2 Study Material

Books (soft copies) will be provided to the students, along with the list of recommended books for further reading. Two assignments for each course will be given. Mode of Teaching: For each course, 45 hours face to face teaching at the main campus Islamabad will be required. In this regard, classes will be arranged by the Department at AIOU main campus Islamabad. The schedule of the lectures will be distributed to students at the start of classes during each semester at AIOU, Islamabad. A minimum of 70% attendance is necessary in all subjects as per AIOU rules.

6.3 Mode of Teaching

For each three credit Hour course, there would be 48 hours face to face teaching support to the students.

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 faculties and convenience of the students.

Continuous Assessment:

- Two home-assignments for each course will be given to the students.
- Two sessional exams assignments (as a continuous 30% weightage of the aggregate marks will be given to the sessional tests.

b. Final Examination

Final Examination will be held at Main Campus, AIOU, Islamabad at the end of each semester. 70% weightage of the aggregate marks will be given to the final exam. Minimum Passing Marks.

Note: The student must qualify each component of a course separately.

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,
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BS Program Coordinator

Dr. Muhammad Yameen Danish
Assistant Professor
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9. Faculty Members

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6. **Ms. Lubna Naz**

Research Assistant

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Email: lubna.naz@aiou.edu.pk

DEPARTMENT OF COMPUTER SCIENCE

The Department of Computer Science (DCS) was established in the year 2000. The Department has received recognition nationwide 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 so as 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.
- ii. Provide high quality education at low cost.
- iii. Provide knowledge to individuals seeking computer skills to increase their job opportunities in their current careers or to pursue new careers.
- iv. Learn in-depth knowledge of computer languages, software engineering, computer architecture, large-scale system software and multimedia in the design.
- v. Provide sufficient conceptual and skill based know how so that successful graduates could initiate IT career in industry and academia.

BS COMPUTER SCIENCE (4-YEAR PROGRAM)

1. Introduction

The BS (CS) program is offered by the Department of Computer Science, AIOU. It is a four- years degree program, covering the recent trends in hardware, software and communication technologies. The program provides an understanding of the field through concepts, theory and techniques. The curriculum of the program has been developed and regularly updated to meet the national, international, social and economic needs. The curriculum revision is normally based on need of fast changing disciplines, emerging technologies and international standards. The structure and other details of the program are confined to HEC with focus on ACM and IEEE-CS recent development.

2. Objectives

The objectives of the program are to:

- i. Develop professionals in the field of computer science.

3. Eligibility

The minimum requirements for admission in a Bachelor degree program in Computer Science is at least 50% marks in Intermediate (HSSC) examination with mathematics or equivalent qualification with mathematics certified by IBCC.

4. Duration of Program

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

5. Scheme of Study

Semester-1

| Code | Title | Credit Hours |
|---------------------------|--|--------------|
| 5451 | English-I: Composition and Comprehension | 3(3 + 0) |
| 5465 | Pakistan Studies | 2(2 + 0) |
| 5468 | Introduction to Computers | 3(3 + 0) |
| 6900 | Computer Programming | 4(3 + 1) |
| 6901 | Applied Physics | 3(3 + 0) |
| 4432 | Calculus-I | 3(3 + 0) |
| Total Credit Hours | | 18 |

Semester-2

| Code | Title | Credit Hours |
|---------------------------|--|--------------|
| 5466/ 5467 | Islamic Studies / Ethics | 2(2 + 0) |
| 5454 | English-II: Technical and Business Writing | 3(3+ 0) |
| 6902 | Object-Oriented Programming | 4(3 + 1) |
| 3409 | Digital Logic Design | 4(3 + 1) |
| 3447 | Statistics and Probability | 3(3 + 0) |
| Total Credit Hours | | 16 |

Semester-3

| Code | Title | Credit Hours |
|---------------------------|--|--------------|
| 5458 | English-III: Communication Skills | 3(3 + 0) |
| 6903 | Discrete Mathematics | 3(3 + 0) |
| 6904 | Data Structures and Algorithms | 4(3 + 1) |
| 6905 | Comp. Organization & Assembly Language | 4(3 + 1) |
| 6906 | Software Engineering | 3(3 + 0) |
| Total Credit Hours | | 17 |

Semester-4

| Code | Title | Credit Hours |
|---------------------------|------------------------------------|--------------|
| 9473/ 9474 | Foreign Language (Arabic)/(French) | 3(3 + 0) |
| 1522 | Linear Algebra | 3(3 + 0) |
| 3438 | Computer Communications & Networks | 4(3 + 1) |
| 6907 | Database Systems | 4(3 + 1) |
| 6908 | E-Commerce | 3(3 + 0) |
| Total Credit Hours | | 17 |

Semester-5

| Code | Title | Credit Hours |
|---------------------------|---------------------------------|--------------|
| 6909 | Artificial Intelligence | 4(3 + 1) |
| 6910 | Operating System | 4(3+1) |
| 3466 | Analysis & Design of Algorithms | 3(3 + 0) |
| - | CS Elective 1 | 3 |
| 1525 | Ordinary Differential Equations | 3(3 + 0) |
| Total Credit Hours | | 17 |

Semester-6

| Code | Title | Credit Hours |
|---------------------------|------------------------------------|--------------|
| 3452 | Theory of Automata | 3(3 + 0) |
| - | CS Elective 2 | 3 |
| - | CS Elective 3 | 3 |
| 6911 | Parallel and Distributed Computing | 3(3 + 0) |
| 3472 | IT Services Management | 3(3 + 0) |
| 4433 | Calculus-II | 3(3 + 0) |
| Total Credit Hours | | 18 |

Semester-7

| Code | Title | Credit Hours |
|---------------------------|------------------------|--------------|
| 3468 | Compiler Construction | 3(3 + 0) |
| - | CS Elective 4 | 3 |
| - | CS Elective 5 | 3 |
| 6912 | Professional Practices | 3(3 + 0) |
| 6913 | Project-I | 3(0 + 3) |
| Total Credit Hours | | 15 |

Semester-8

| Code | Title | Credit Hours |
|---------------------------|-----------------------|--------------|
| 3497 | Information Security | 3(3 + 0) |
| - | CS Elective 6 | 3 |
| 3442 | IT Marketing Concepts | 3(3 + 0) |
| 3448 | Numerical Computing | 3(2 + 1) |
| 6914 | Project-II | 3(0 + 3) |
| Total Credit Hours | | 15 |

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

**Major Areas of Specialization (BS (CS) Elective Courses):
General Computing**

| Code | Title | Cr. Hrs. |
|------|--------------------------------|----------|
| 6915 | Visual Programming | 3(2 + 1) |
| 6916 | Web Technologies | 3(2 + 1) |
| 6917 | Computer Vision | 3(2 + 1) |
| 3499 | Mobile Application Development | 3(2 + 1) |
| 6918 | Data Analytics | 3(2 + 1) |
| 3449 | Human-Computer Interaction | 3(3 + 0) |

Software Engineering

| Code | Title | Cr. Hrs. |
|------|-----------------------------------|----------|
| 3465 | Software Engineering-II | 3(3 + 0) |
| 3467 | Database-II | 3(3 + 0) |
| 3464 | Object-Oriented Analysis & Design | 3(3 + 0) |
| 3481 | Design Patterns | 3(3 + 0) |
| 6920 | Software Architecture | 3(3 + 0) |
| 6919 | Software Quality & Testing | 3(3 + 0) |

Artificial Intelligence

| Code | Title | Cr. Hrs. |
|------|-----------------------------|----------|
| 6921 | Machine Learning | 3(3 + 0) |
| 6922 | Deep Learning | 3(3 + 0) |
| 6923 | Artificial Neural Networks | 3(3 + 0) |
| 6924 | Natural Language Processing | 3(3 + 0) |
| 6917 | Computer Vision | 3(2 + 1) |
| 6918 | Data Analytics | 3(2 + 1) |

Cyber Security

| Code | Title | Cr. Hrs. |
|------|--|----------|
| 3484 | Data & Network Security | 3(3 + 0) |
| 6927 | Cryptography | 3(2 + 1) |
| 6928 | Digital Forensics | 3(2 + 1) |
| 6929 | Vulnerability Assessment & Reverse Engineering | 3(2 + 1) |
| 6930 | Secure Software Design/Database Security | 3(2 + 1) |
| 6931 | Cloud Architecture Security | 3(3 + 0) |

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

6. Fee Tariff

| Item | |
|--|------------|
| Registration Fee: (At the time of 01 st admission) | Rs. 550/- |
| Admission Fee: (At the time of 01 st admission) | Rs. 1100/- |
| Technology Fee (Each semester) | Rs. 550/- |
| Fee for 2 Credit Hour Courses (01 course in First Semester with 02 Credit Hours) 01 x 4400 = 4400 | Rs. 4400/- |
| Fee for 3 Credit Hour Courses (04 courses in First Semester with 03 Credit | Rs.26400/- |

| | |
|---|--------------------|
| Hours)04 x 6600 = 26400 | |
| Fee for 4 Credit Hour Courses (01 course in First Semester with 04 Credit Hours)01 x 8800 = 8800 | Rs. 8800/- |
| Lab Fee | Rs. 5500/- |
| Total Fee for First Semester | Rs. 47300/- |

7. Mode of Study

7.1 Medium of Instruction

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

7.2 Study Material

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

7.3 Mode of Teaching

- The BS (CS) program is a merit-based program which is offered in Face-to-Face Mode.
- The Department of Computer Science is offering BS (CS) Program at Main Campus, Islamabad.
- The BS (CS) Program is also being offered at selected Regional Centers of AIOU by using modern technologies. Under this program, the course work will be conducted through video-conferencing/internet. Distance Education will be delivered by faculty members from Department of Computer Science, Main Campus. A local faculty

member/staff will be provided to assist in administrative and lab assignments. All assessments will be performed as per rules of the University.

7.4 Assessment and Evaluation

| Continuous (Pass percentage is 50%) | | Final (Pass percentage is 50%) |
|--|---|---|
| Assignment/ Quizzes | Midterm/Presentation/ Semester Project | |
| 10% | 20% | 70% |

Note: The 70% percent attendance is mandatory in each course.

8. Guidelines for Online Applications

- i. Visit AIOU Website: <https://aiou.edu.pk/>
- ii. Click on “Admission (OAS)”
- iii. Click on “Application for New Admission”
- iv. Click 'Register' & fill details
- v. Upon successful registration please click on login
- vi. Fill login details and login to the portal
- vii. After login click on Step-1 and complete your profile.
Note: All tabs should be filled before applying for admissions.
- viii. After completion of Step-1, click on Step-2 then click on "Download Challan" against program (s) you wish to apply.
- ix. Pay the *admission form fee* as per AIOU prescribed criteria through selected bank branches or online payment methods.

- x. After admission fee confirmation, you will be called on through SMS to visit the department for the verification of your credentials.
- xi. After the verification, you will be informed whether you are eligible for the admission in BS (CS) or not.

Selection Criteria

- i. Once your eligibility is confirmed by the Computer Science Department, you can select your first semester courses from the online portal.
- ii. After selection of first semester courses, a fee challan will be generated by the system.
- iii. You will pay the requisite fee as per AIOU prescribed criteria through selected bank branches or online payment methods.
- iv. After fee verification by the concerned AIOU department, your admission will be confirmed.
- v. You can check the status of your application at any stage through your account from AIOU portal, i.e. <https://aiou.edu.pk/>

9. Contact Details

1. Program Coordinator

Chaudhary Muhammad Shahbaz Anjum
Lecturer
Phone # 051-9575382

2. Admission Cell at DCS

For further information, please feel free to contact:
Dealing Official: Mr. Nadir Khan
Cell # 051-9250091

10. Faculty Members

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BS AGRICULTURAL TECHNOLOGY (4-Year Program)

4. Introduction

The BS Agricultural Technology (4-year program) will provide a solid foundation to the students in agricultural business practices, and expanding their career options in agro-based industries. It could be a first core initiative in securing a advanced level degree in the field of Agri-Tech.

The degree program of BS Agricultural Technology will acquire popularity for two reasons. First, the challenges to current agriculture production system can be eliminated by adopting the new and advanced farm technologies and innovative post-harvest strategies, and this degree program will develop required capacity in students. Second, the food sovereignty in the country needs skillful manpower that can apply the decision tools in developing site-specific production technology of different crops, managing stressful environment effectively, and promoting climate smart approaches in the country.

Department of Agricultural Sciences is very confident that graduates produced under the curriculum of BS Agricultural Technology will become competitive professionals to run their own agro-based industries, provide technical skills to the progressive and small holdings farmers, generate awareness among common farmers regarding value addition in agricultural produces. At completion of this degree program, the students will have enough knowledge and skills that will help them to develop site-specific production technologies for the farmers by using ICT-based crop models

and soft wares. This program will develop the capacity of students to work out for on-farm climate smart practices which will ensure agricultural resilience and higher farm productivity.

5. Objectives

The main objectives of BS Agricultural Technology are:

- i. To generate, integrate, and apply knowledge to individuals for promoting sound agricultural technologies in order to empower farmer and other clientele imbed with increased knowledge and productivity
- ii. To enable graduates in understanding and applying the concepts of agricultural productivity and sustainability in the conduct of national, regional and global developments
- iii. To skill development of students for innovate practices that will enhance productivity and environmental sustainability
- iv. To prepare for a career in technical management, biotechnology and agricultural industries through the study of agricultural and biological sciences, engineering systems and business.

6. Eligibility Criteria

The candidates having both F.Sc pre-medical & pre-engineering and equivalent with at least 33% marks from national and international recognized institutions will be eligible to apply. Foreign certificate/degree holders will need

to provide an equivalence certificate from IBCC to seeking admission in BS Agricultural Technology

7. Duration of Program

The minimum duration of degree program in BS Agricultural Technology will be four years, while the maximum time limit will be six years from the date of first registration of the student in the program.

8. Scheme of Studies

| Semester 1 | | |
|--------------------|--|---------------------|
| Course Code | Course title | Credit Hours |
| 6950 | Basic Agriculture | 3(2+1) |
| 6951 | Introduction to Animal Husbandry | 3(2+1) |
| 5451 | English-I: English Composition & Comprehension | 3(3+0) |
| 5465 | Pakistan Studies | 2(2+0) |
| 5469 | Introduction to Sociology | 3(3+0) |
| 5468 | Introduction to Computers | 3(3+0) |
| | Total | 17 |
| Semester 2 | | |
| Course Code | Course title | Credit Hours |
| 6952 | Agro-Technology of Field Crops | 3(2+1) |
| 6953 | Plant Protection | 3(2+1) |
| 6954 | Field Crop Physiology | 3(2+1) |
| 3644 | Basics of Food Sciences | 4(3+1) |
| 5454 | English-II: Technical and Business Writing | 3(3+0) |
| 5466/5467 | Islamic Studies / Ethics (For Non- | 2(2+0) |

| Semester 3 | | |
|--------------------|---|---------------------|
| Course Code | Course title | Credit Hours |
| 6955 | Climate Change and Crop Productivity | 3(2+1) |
| 6956 | Introduction to Agri. Business Management | 3(3+0) |
| 4434 | Introductory Statistics | 3(3+0) |
| 5458 | English-III: Communication Skills | 3(3+0) |
| 5471 | Mass Communication | 3(3+0) |
| 9467 | Pre-calculus | 3(3+0) |
| | Total | 18 |
| Semester 4 | | |
| Code | Course title | Credit Hours |
| 6957 | Sustainable Agriculture | 3(3+0) |
| 6958 | Horticultural Crop Production | 3(2+1) |
| 6959 | Food Security and Agricultural Extension | 3(3+0) |
| 6960 | Sustainable Rural Livelihood | 3(3+0) |
| 7405 | Plant Ecology-I | 3(2+1) |
| 7407 | Plant Biochemistry | 3(3+0) |
| | Total | 18 |
| Semester 5 | | |
| Course Code | Course title | Credit Hours |
| 6961 | Cropping System Modeling | 3(2+1) |

| | | |
|--------------------|---|---------------------|
| 6962 | Protected Horticulture | 3(2+1) |
| 6963 | Soil Biology and Ecology | 3(3+0) |
| 6964 | Gender and Rural Development | 3(3+0) |
| 6965 | Modern Trends in Fruit Production | 3(2+1) |
| 6966 | Advances in Farm Mechanization | 3(3+0) |
| Total | | 18 |
| Semester 6 | | |
| Course Code | Course title | Credit Hours |
| 6967 | Seed Production Technology | 3(2+1) |
| 6968 | Municipal and Agro Waste Management | 3(3+0) |
| 6969 | Plant Resource Utilization | 3(2+1) |
| 6970 | Animal Feed Technology | 3(2+1) |
| 6971 | Agriculture Biotechnology | 3(2+1) |
| 6972 | Climate Smart Agriculture in Pakistan | 3(3+0) |
| Total | | 18 |
| Semester 7 | | |
| Course Code | Course title | Credit Hours |
| 6973 | Plant Nutrition and Bioproduct Development | 3(2+1) |
| 6974 | Dairy Technology | 3(2+1) |
| 6975 | Meat Technology | 3(2+1) |
| 6976 | Food Processing and Preservation | 3(2+1) |
| 6977 | Agricultural Information Management Systems | 3(3+0) |
| 6978 | Agricultural Technology Transfer | 3(2+1) |
| Total | | 18 |

| Semester 8 | | |
|--------------------|---------------------|-------------|
| Course Code | Course title | C.H. |
| 6979 | Internship | 6 (0+6) |

Total Credit Hour = **131**

9. Fee Tariff for 1st Semester

| Items | |
|---|----------------|
| Registration Fee (at the time of 1 st admission) | Rs. 550/- |
| Admission Fee (at the time of 1 st admission) | Rs. 1,100/- |
| Technology Fee (per semester) | Rs. 550/- |
| LAB CHARGES | Rs. 2750/- |
| Fee of 1 st semester (Rs. 2200 per credit hour) | Rs. 37400/- |
| Total | 42350/- |

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

10. Mode of Study

7.1 Medium of Instructions:

The medium of instructions & examinations will be in English.

7.2 Study Material: Class lectures and other reading materials will be provided by the course instructor. In addition, the student will be advised to consult other reference books for further readings.

7.3 Mode of Teaching

University will provide face to face teaching to the students

The schedule of classes and dates of submission of assignments will be announced by the department

7.4 Assessment and Evaluation

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

7.4.1 Continuous Assessment

- i. For each discipline specific face to face course the marks obtained by each student in written assignments will constitute 2/3 of the continuous assessment. A student has to obtain a minimum of 50% marks in assignments in order 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 has to obtain a minimum of 50% marks in the practical workshop individually in order to pass this component.

7.4.2 Final Examinations

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

7.4.3 Internship

The farmers/farm managers/Director will evaluate the practical work done by the student. An expert committee to be appointed by Chairman of the department will also evaluate the students' participation at the farms and at the universities/organizations. The committee will also evaluate and grade/mark the report and seminar. The seminar/presentation delivered for internship will be mandatory. The following criteria will be applied for evaluation of internship

| Component | Weight (%) |
|--|------------|
| Evaluation by farmers/farm managers/Director | 20 |
| Report & presentation | 30 |
| Written exam | 25 |
| Viva Voce | 25 |

Note: Minimum 70% attendance is mandatory as per AIOU rules. A student must secure minimum 50% marks in each component to pass out a particular subject.

11. Guideline for Online Application

Students can apply for BS Agricultural Technology by follow the below steps;

- i. Visit: 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. Fill login details and login to the portal
- vi. After login click on Step-1 and complete your profile.
Note: All tabs should be filled before applying for admissions.
- vii. After completion of Step-1, click on Step-2 then click on "Download Challan" against program (s) you wish to apply.
- viii. Pay the *admission form fee* as per AIOU prescribed criteria through selected bank branches or online payment methods.

- ix. After admission fee confirmation, you will be called on through SMS to visit the department for the verification of your credentials.
- x. After the verification, you will be informed whether you are eligible for the admission in BS Program or not.

12. Contact Details

Chairman

Department of Agricultural Sciences
Block # 06, 1st Floor, AIOU, H-8, Islamabad, Pakistan
Tel: 051-9575450:

Email: sher.muhammad@aiou.edu.pk

Coordinator, BS Agricultural Technology

Department of Agricultural Sciences
Block # 06, 1st Floor, AIOU, H-8, Islamabad, Pakistan
Tel: 051-9575483

Email: muhammad.shaukat@aiou.edu.pk

10. Faculty Members

1. **Prof. Dr. Sher Muhammad**
Chairman
Phone # 051-9575450
2. **Dr. Shafique Qadir Memon**
Assistant Professor
Phone # 051-9575475
3. **Dr. Farhat Ullah Khan**
Assistant Professor
Phone # 051-9575473
4. **Dr. Muhammad Tarique Tunio**
Assistant Professor

Phone # 051-9575474

5. **Dr. Sabir Hussain Shah**
Assistant Professor
Phone # 051-9575476
6. **Dr. Muhammad Yasin**
Assistant Professor
Phone # 051-9575450
7. **Dr. Mahwish Siraj**
Lecturer
Phone # 051-9575482
8. **Dr. Zaid Mustafa**
Lecturer
Phone # 051-9575481
9. **Dr. Muhammad Shaukat**
Lecturer
Phone # 051-9575483

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 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 programmes 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.

B.S Instructional Design and Technology Programme Secondary Teacher Education Department (STED)

Introduction

In increasingly technology-driven educational landscape, it is imperative that 21st century learners upgrade their skills and become proficient in the use of technology in every walk of life and to effectively facilitate the learning process. This overall, program focuses on instructional design process, learning theories, models, strategies, media, communication delivery models and interactive technologies, web designing and programming etc.

This program concentrates on following three areas:

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

Program Name: B.S Instructional Design and Technology

Programme Duration: 4 years (8 Semesters)

Admission Criteria: FA/F.Sc or equivalent with at least 33% marks

Semester Duration: 16-18 weeks

Total Programme Credit Hours 132 Credit Hours

Total Number of Courses: 42 Credit Hours including Internship, Practicum and Research Project

Medium of Instruction: English

Delivery Mode: Face to Face

Pass Marks: 50%

Semester-wise Break-up: Scheme of Study for BS

Instructional Design

Face to Face Offering

SEMESTER 1

| Sr. No | Course Code | Courses | Nature of Course | Credit Hours (Theory + Practical) |
|--------|-------------|---------|------------------|-----------------------------------|
|--------|-------------|---------|------------------|-----------------------------------|

| | | | | |
|--|------|--|----|-----------------|
| 1. | 5458 | Basics of Technical English (English-III) ⁺ | C7 | (3+0) |
| 2. | 8254 | Classroom Management ⁺ | G2 | (3+0) |
| 3. | 8255 | Organizational Behavior ⁺ | G5 | (3+0) |
| 4. | 8256 | General Science ⁺ | G6 | (3+0) |
| 5. | 8257 | Introduction to Instructional Design ⁺ | F3 | (3+0) |
| 6. | 6902 | Object Oriented Programming | M5 | (3+1) |
| Total Credit Hours (Theory + Practical) | | | | 18+01=19 |

| | | | | |
|----|------|----------------------------|----|--------|
| 1. | 5451 | English Compulsory -I | C1 | 3(3+0) |
| 2. | 5465 | Pakistan Studies | C2 | 2(2+0) |
| 3. | 8246 | General Math and Statistic | C3 | 3(3+0) |
| 4. | 8247 | Educational Psychology & | G1 | 3(3+0) |

| | | | | |
|----|------|--|----|--------|
| | | Guidance | | |
| 5. | 8248 | Technology and Learning | F1 | 3(3+0) |
| 6. | 8249 | Applications of Information and Communication Technology | C8 | 3(2+1) |

SEMESTER 2

| | | | | |
|----|-----------|--|----|--------|
| 1. | 5454 | English Compulsory –II | C4 | (3+0) |
| 2. | 8250 | Programming Fundamentals | M2 | (3+1) |
| 3. | 5466/5467 | Islamic Studies/Ethics | C6 | 2(2+0) |
| 4. | 8251 | Calculus and Analytic Geometry | G3 | (3+0) |
| 5. | 8252 | Learning Styles and Learning Environment | F2 | (3+0) |
| 6. | 8253 | Curriculum and Instruction | G4 | (3+0) |

Total Credit Hours (Theory + Practical) 18+01 =19

SEMESTER 3

SEMESTER 4

| | | | | |
|----|------|--|----|-------|
| 1. | 8258 | Foundations in Education | C9 | (3+0) |
| 2. | 5904 | Introduction to Web Based Instructions | F4 | (3+0) |
| 3. | 5916 | Introduction to Open Educational Resources | F5 | (3+0) |

| 4. | 8259 | Educational Measurement and Evaluation | G7 | (3+0) |
|--|-------------|---|------------------|-----------------------------------|
| 5. | 8260 | School, Society & Teacher | G8 | (3+0) |
| 6. | 5912 | Learning Management Systems and Organizations | F6 | (3+0) |
| Total Credit Hours (Theory + Practical) | | | | 18+0=18 |
| SEMESTER 5 | | | | |
| Sr. No | Course Code | Courses | Nature of Course | Credit Hours (Theory + Practical) |
| 1. | 8261 | Educational Research and Statistics | M1 | (3+0) |
| 2. | 8262 | Education in Pakistan | C5 | (3+0) |
| 3. | 5908 | Web Design-I (website design & development) | M3 | (3+1) |
| 4. | 8263 | Instructional Strategies and Assessment Methods | F7 | (3+0) |
| 5. | 5910 | Developing Instructional Media | F8 | (3+0) |
| Total Credit Hours (Theory + Practical) | | | | 15+ 01=16 |
| SEMESTER 6 | | | | |
| Sr. No | Course Code | Courses | Nature of Course | Credit Hours (Theory + Practical) |
| 1. | 5914 | Web Design-II | M4 | 3+1 |
| 2. | 5917 | Trends and Issues in Instructional Design | M6 | 3+0 |

| 3. | 5913 | Visual and Verbal Communication in Instructional Design | F9 | 3+0 |
|--|-------------|---|------------------|-----------------------------------|
| 4. | 8264 | Ethical use of Instructional Material (proper usage of resources) | E3 | 3+0 |
| 5. | 8265 | Internship (Institution) | F10 | 0+3 |
| Total Credit Hours (Theory + Practical) | | | | 12+04=16 |
| SEMESTER 7 | | | | |
| Sr. No | Course Code | Courses | Nature of Course | Credit Hours (Theory + Practical) |
| 1. | 8266 | Instructional Designs: Theories and Models | M7 | 3+0 |
| 2. | 3499 | Mobile Application Development | E1 | 3+0 |
| 3. | 5909 | Systems Approach to Designing Instructional Materials | M10 | 3+0 |
| 4. | 5907 | Multi-media Applications in Education | M8 | 3+1 |
| 5. | 5915 | Internship (Software house) | M9 | 0+3 |
| Total Credit Hours (Theory + Practical) | | | | 12+04=16 |

| SEMESTER 8 | | | | |
|--|--------------------|--------------------------------|-------------------------|--|
| Sr. No | Course Code | Courses | Nature of Course | Credit Hours (Theory + Practical) |
| 1. | 8267 | Higher Education | E4 | 3+0 |
| 2. | 8268 | Future Challenges in Education | E2 | 3+0 |
| 3. | 5918 | Research Project | M11 | 0+6 |
| Total Credit Hours (Theory + Practical) | | | | 06+06=12 |

Fee Tariff for 1st Semester

| Items | |
|--|----------------|
| Registration Fee (Once at time of admission) | Rs. 550/- |
| Admission Fee (Once at time of admission) | Rs. 1100/- |
| Technology Fee (per semester) | Rs. 550/- |
| Per 3 Credit hours course fee: Rs. 6600 | Rs. 39600/- |
| Total | 41800/- |

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

- Applicants will deposit admission processing fee (Rs.500) in designated banks or through Telcos.
- Eligible candidates for (**Merit Based Programmes**) are required to deposit admission fee in any branch of the following banks:
 1. First Women Bank Limited (FWBL)
 2. Allied Bank Limited (ABL)
 3. Muslim Commercial Bank (MCB)
 4. United Bank Limited (UBL)
- Fee can also be Deposited through Jazz Cash, Easy Paisa and Upaisa Mobile App/USSD String *786#, Retailer Agent, Franchise and Branches of Mobilink, Telenor and Ubank. For more detail please visit university website.
- The Banks/Mobile App/Retailer Agents/Franchise/Branches will provide Transaction ID of deposited fee.

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

PROCEDURE OF FEE DEPOSIT THROUGH TELECOS

Easypaisa

Through Easypaisa App

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

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

Through USSD String *786#

The Easypaisa mobile wallet account may be created by dialing *786#. For using this mode, student must have balance equal to his/her payable fee in Easypaisa mobile

account. There are **no transactions charges**, if student use this mode to pay his/her fee. Following is the procedure of fee payment through USSD string *786#

1. Dial *786#
2. Select “4” (Payments)
3. Select “7” (Fee Collections)
4. Select “99” (Next)
5. Select “AIOU”
6. Enter Challan No.
7. Screen will show the payable amount & due date
8. Enter Mobile Account PIN
9. Fee will be Paid and student will receive confirmation SMS from 3737
10. Student will write **Transaction ID** and “**Paid via Easypaisa786 String**” on the challan and admission form. Further, students are advised to keep the confirmation SMS save in phone until the receipt of intimation of admission confirmation from AIOU.

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

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

1. Student may visit any nearest Easypaisa Retailer (Agent) Shop, Telenor franchise or Telenor Microfinance Bank branch
2. Student will inform the retailer/franchisee/teller that he/she wish to pay fee of AIOU

3. Retailer/Franchisee/Teller will ask the student to share CNIC number, Mobile Number & Challan Number
4. Retailer/Franchisee/Teller will enter the Challan Number in his Easypaisa Tab/system
5. Tab/System will show the payable amount & due date
6. Student will hand-over the fee amount to retailer/franchisee/teller
7. Once the fee amount is handed over, the retailer/franchisee/teller will process the fee transaction
8. Fee will be paid and student will receive confirmation SMS from 3737 on mobile number. Transaction charges will be mentioned in the confirmation SMS
9. Student will write **Transaction ID** and **“Paid via Easypaisa Agent/Franchisee/Teller”** on the challan and admission form. Bank stamp will be embossed only in case the fee is paid through Telenor Microfinance Bank branches. Further students are advised to keep the confirmation SMS save in phone until the receipt of intimation of admission confirmation from AIOU.

Upaisa Through Upaisa App

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

1. Login to Upaisa App
2. Please click on “Payments”

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

Through USSD String *786#

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

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

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

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

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

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

Jazz Cash (Through Jazzcash App)

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

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

Through USSD String *786#

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

1. Dial *786#

2. Select “Payments”
3. Select “Education Payments”
4. Select “AIOU”
5. Enter Challan No.
6. Screen will show the payable amount
7. Enter MPIN
8. Fee will be Paid & student will receive confirmation SMS
9. Student will write **Transaction ID** and “**Paid via Jazzcash786 String**” on the challan and admission form. Students are advised to keep the confirmation SMS save in phone until the receipt of intimation of admission confirmation from AIOU.

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

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

1. Student may visit any nearest Jazzcash Retailer (Agent) Shop, Jazz Franchise or Mobilink Microfinance Bank branch
2. Student will inform the retailer/franchisee/teller that he/she wish to pay fee of AIOU
3. Retailer/Franchisee/Teller will ask the student to share CNIC number, Mobile Number & Challan Number
4. Retailer/Franchisee/Teller will enter the Challan Number in his Jazzcash Tab/system

5. Tab/System will show the payable amount & due date
6. Student will hand-over the fee amount to retailer/franchisee/teller
7. Once the fee amount is handed over, the retailer/franchisee/teller will process the fee transaction
8. Fee will be paid and student will receive confirmation SMS on mobile number. Transaction charges will be mentioned in the confirmation SMS
9. Student will write **Transaction ID** and “**Paid via Jazzcash Agent/Franchisee/Teller**” on the challan and admission form. Bank stamp will be embossed only in case the fee is paid through Mobilink Microfinance Bank branches. Students are advised to keep the confirmation SMS save in phone until the receipt of intimation of admission confirmation from AIOU.

Admission form (Original) to be sent to Directorate of Admission and Mailing through Post Office or any other courier service.

REGULATIONS FOR REFUND OF ADMISSION FEE

- i. The Applicant/candidate/student who has submitted his/her fee for Admissions but does not wish to continue and applied for refund of fee before the start of his/her study period as per Academic Calendar available on the AIOU website corresponding to his/her respective semester i.e

Autumn or Spring, the fees will be refunded after the deduction @ 10% of the total fee.

- ii. The Applicant/Candidate who was not eligible but deposited the fee for admission and applied for refund within one year from the date of fee deposit, the fee shall be refunded after deduction @ 15% of total fee.
- iii. The student who has deposited his/her fee in excess of due fee that total excess amount shall be refunded or adjusted as the case may be.
- iv. The Treasurer Department shall verify the fee of students and shall send the case to the Audit Department for pre-audit.
- v. The cheque will be issued to the candidate by the Campus Payment Section (CPS), Treasurer's Department.
- vi. In the case of death, the full fee will be refunded through crossed cheque in favour of the Blood Relative of deceased student, after fulfilling all the codal formalities. The refund case must be submitted within one year of fee deposit.
- vii. In case the students who are not allowed/granted admission to a program offered by the University due to less enrollment/non formation of viable group/non offering of courses, full fee will be refunded to them.
- viii. If the admission of an Applicant/Candidate is not matured due to any reason beyond the control of the
- ix. University or due to unforeseen issues, the whole paid fee, without any deductions shall be refunded to the respective applicant/candidate. The refund case must be submitted within one year of fee deposit.

DISABILITY COORDINATORS:

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

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

IMPORTANT TELEPHONE NUMBERS

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

PART-TIME REGIONAL COORDINATING ADDRESSES

| Sr. # | Region | Regional Coordinators | Mobile # |
|-------|------------|--|--------------|
| 1 | D. G. Khan | Mr. Tahir Hussain, Regional Coordinator, Allama Iqbal Open University, Assistant Professor, Govt. Graduat College, Tehisle & Distt. Layyan | 0300-9542050 |
| 2 | D. G. Khan | Mr. Mohammad Ishaq, Regional Coordinator, Allama Iqbal Open University, Associate Professor(Rtd), Ward No.13, Tehil Karo Lal Easan Distt. Layyah | 0300-6765338 |
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