Research is the life blood of the Universities

University of Sindh

Graduate Studies Catalogue 2014

For MS/M.Phil & Ph.D Programs offered in various disciplines at Allama I.I. Kazi Campus Jamshoro

Serving the nation since 1947, with the mission:

The University of Sindh, being the first after the birth of Pakistan and second oldest university of the country and a representative of Sindh, the cradle of man civilization, has a particular message to deliver through high quality education in disciplines of Arts, Humanities, Social and Natural Sciences, Technology, Law, Management and Emerging Sciences to bring people from darkness to light without discrimination of caste, creed, gender, geographical boundaries, beliefs, religion or language. The University aims to promote a culture of inquiry, creativity, critical thinking, free exchange of thoughts, research, unity in diversity, cultural pluralism and indigenous knowledge among its students and faculty in particular and society in general to produce better generation and leadership for liberal, prosperous, congenial, harmonious and progressive world.
About this Catalogue

Dear aspirants of Graduate studies,

The Catalogue for MS/M.Phil & Ph.D programs being offered from 2014 session onward has been specifically brought out not only to cope up with and put together increasing volume of relevant information, but also to facilitate you to concentrate on the objective information you are keen to seek.

A contributory factor is the expanded coursework requirement for graduate studies; it comprises 24 CH courses and 16 CH thesis research, to qualify for the MS/M.Phil degree and 18 CH Ph.D coursework which require details to be spelled out.

The Ph.D coursework outlines in most of the Social Sciences disciplines as well as in Islamic Culture & Education are under preparation.

The Catalogue will serve as a compendium throughout your stay at the University providing you details of curricula and courses for the degree program you join, as well as the Regulation for Registration in these programs.

As you will have noted from the advertisement, the pre-requisite for enrolment is Master or 4-yr BS degree in the relevant discipline with good second division or equivalent score, besides qualifying NTS / University conducted pre-Admission Test. Please refer to page 08 of the Catalogue for information about admission test for your guidance.

Your Test Score will be calculated by Optical Mark Reader OMR Please study sample answer sheet at the end of this Test Paper. Use only Black Ballpoint provided for this purpose, for marking your answer and follow instructions carefully.

Please note that educational policies and procedures are continually reviewed and changed in keeping with the educational mission of the University. Consequently, this document cannot be considered as binding. All syllabi and programs listed are subject to revision / approval by the Academic Council of the University.

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Dear University of Sindh Students,

Greetings and welcome to University of Sindh at Jamshoro where great things happen!

As our world is in the second decade of the 21st Century, you and your fellow students share the commonality of a new beginning at the University of Sindh. You are starting an exciting journey of academic excellence and personal growth at one of Sindh’s premier institutions of higher education. I know this voyage shared with so many others will be filled with personal rewards and mutual satisfaction!

The University is fully geared to help you shape your future and turn your dreams into reality. The curricula of all degree programs are updated to keep them demand oriented. The 4-yr bachelor degree program is offered in 57 disciplines besides Pharmacy & Law (5-yr)- wide spectrum to choose from, to suit your potential and genius. All this aim at providing new avenues for you to carve out your future.

I have introduced reforms in Semester System that would make it easier for you to learn and with commitment, earn your cherished degree with distinction. The teacher will on the very first day provide you course outline, elaborating what he/she is going to teach besides introducing himself. He / She will also inform you about grading evaluation. If at any stage you are not satisfied with the grading, you can approach the Department Chairperson to solve the problem and then to the Grade Appeal Committee to redress your grievence.

The Summer Classes have also been started from 2013 to improve your grades.

The 75% attendance is compulsory and faculty are advised to send the attendance sheet to concerned Chairpersons and Directors Office to check every month. You also have to make sure that you submit your assignments on time and take all tests particularly mid term.

You will be happy to know that the University has ensured through negotiation, a Code of Conduct that students irrespective of political affiliation will cooperate with the Administration in maintaining peaceful atmosphere in the university, conducive to pursuit of knowledge.

Discipline in University Hostels where above 5000 male & female students reside, is also maintained. The Dean Students Affairs has been appointed to ensure that students & hostlers’ grievances are resolved expeditiously.

The University is always keen to provide all facilities for extra curricular activities, sports & entertainment to send you out as well groomed persons ready to take on challenges. Sports facilities are available in Hostels as well as for outdoor Games, Internet connectivity is available in all departments & Central Library; efforts are afoot to extend it to every room of the hostels.

The university is committed to providing quality education and dissemination of knowledge particularly providing access to higher education in far flung rural areas deprived of the means to pursue studies in urban centres. The university has already established campuses in Badin, Dadu, Larkana, Mirpurkhas, Bhitshah and thatta to achieve this objective. This is besides enrolment of more than 24,000 students at the main campus.

My pledge to you as a Vice Chancellor is that our administrators, faculty and staff will do all within their professional expertise to make great things happen during your Jamshoro years. The other side of the coin is your commitment to make great things happen for yourself. Together, our mutual commitment to excellence and dedication to one cause represents a winning combination! How can we not succeed?

This Graduate Catalogue is specifically aimed toward advancing your academic growth by helping you through your successful career at University of Sindh of Jamshoro. I know it will serve you well.

And remember at Jamshoro, we’ll take you to the world and in so doing bring the world to you. In the classrooms, the libraries, the laboratories, the aesthetic venues and in the many extracurricular activities that provide the complete experience; great things are indeed happening here!

Welcome aboard! Let your Journey of hardwork & excellence begin!
Dr. Nazir A. Mughal
First Semester

First Semester Teaching starts ................................................ Jan. 15
Mid Term Test (discretion of course teacher) ..................... 1st week of March
Observance of Founder’s Week............................................. April 9-14

(Academic programs to continue as per schedule)
First Semester Teaching ends .............................................. May 15
First Semester Final Test commencing............................. June 01
First Semester Grading...................................................... June 17

Summer Session......................................................... June 15 to July 31

Candidates qualifying 1st semester coursework with GPA 2 or above are required to discuss research topic with proposed Supervisor and prepare research synopsis during vacation.

Second Semester

Teaching commences ................................................... August 03, 2014

Submission of Synopsis for approval of topic & Supervisor by the Advanced Studies & Research Board
Mid Term Test (teacher's discretion) ............................. 1st week of October
Second Semester Teaching ends ..................................... Nov. 29
Second Semester Final Test .............................................. from Dec. 10
Final Semester Grading ................................................... Dec. 20
Winter Break ............................................................... Dec. 24 - Jan. 02

List of holidays for the University of Sindh and its Affiliated Colleges during the year 2014

National Holiday

* Eid-e-Milad- un- Nabi .................................................. Jan. 28, 2014
Kashmir Solidarity Day .................................................. Feb. 05, 2014
Pakistan Day ............................................................. Mar. 23, 2014
*Eid-ul-Fitr ................................................................. July 29-31, 2014
*Eid-ul- Azha ............................................................... Oct. 07-09, 2014
Allama Iqbal Day ........................................................ Nov. 09, 2014
* Youm-e-Ashur ............................................................. Nov. 07-08, 2014
Quaid-e-Azam’s Birthday/ Christmas Day ................. Dec. 25, 2014

Optional Holidays
Non-Muslims University employees are entitled to avail any three of the following optional Holidays, in a Calendar Year.

01. Shivratri  
02. Holi  
03. Easter Sunday  
04. Baisakhi  
05. Basant Punchami  
06. Janam Ashtami  
07. Durga Puja  
08. Dussehra  
09. Devali  
10. Guru Nanik Birthday

* (Subject to appearance of the moon)

about the University ..........

The University of Sindh, the second oldest University of the country, was constituted under the University of Sindh Act. No. XVII of 1947 passed by the then Legislative Assembly of Sindh. The Act was subsequently revised and modified in 1961 and later. The Act of 1972 under which the University is presently functioning provided for greater autonomy and representation of teachers.

From 1947 to 1951 the University functioned solely as an examining body. However, after its relocation in Hyderabad in 1951, it started functioning as a teaching university in pursuit of fulfillment of its charter and mission to disseminate knowledge. The first teaching department, namely, Department of Education, raised to the status of Faculty later, was started in view of the great dearth of trained teachers in the country. The departments of basic Science disciplines as well as other departments on humanities side were gradually added by mid fifties.

The development of the present campus, designated as Allama I.I. Kazi Campus, at Jamshoro, about 17 kilometers from Hyderabad started in late fifties.

There are 57 teaching institutes/centres/departments functioning under various academic Faculties. Degree programs in some of the disciplines, e.g., Biotechnology & Genetic Engineering, Environmental Science, Law (5-yr. degree and LLM), Anthropology & Archaeology and Forestry have been added since 2001. University of Sindh, Laar Campus at Badin started functioning in 2007, Mirpurkhas campus of the University has been launched from Jan. 2010. Dadu Campus of the University is functioning from 2012 Thatta, Larkana and Bhitshah (added) Fall Semester. In addition, there are presently more than 65 Degree & Post Graduate Public Sector Colleges along with 12 Private Colleges and 5 Law Colleges affiliated with the University.

Programs of Studies
The University teaching institutes/ departments, on Humanities side, offer programs leading to the award of 3-year Bachelor’s (Honours) degree in various general and basic disciplines while 4-year Bachelor degree is offered under the Faculties of Natural Sciences, Social Sciences and Commerce & Business Administration and in the department of Art & Design, English & Sindhi. Degree in Pharmacy (Pharm-D) and Bachelor of Law are five year duration.

Each Faculty works under the Dean, appointed by the Chancellor for a term of initial 3 years. The Master degree programs generally comprises minimum one year duration after 3-Yr. Honours and of 2-year duration after Bachelor (Pass) degrees. Students obtaining 4-yr. Bachelor degree are taken directly for M.Phil/ MS. studies.
The two year Bachelor (Pass) degree programs in Arts, Commerce & Sciences are conducted through various Degree Colleges affiliated with the University of Sindh.

The teaching for 3-year Bachelor of Law degree is conducted through the affiliated professional Law colleges. The LL.M. and the 5-yr. Law degree(D.Jur.) classes are conducted in the Institute of Law @ Elsa Kazi Campus, Hyderabad.

Degree programs in the Evening shift introduced since 2001 include Master’s degree in English, 4-yr. BS Chemistry, Computer Science and Information Technology, Commerce, Master’s degree in Telemedicine, E-commerce and Multimedia Technology, Business Administration and Public Administration. Postgraduate Diploma in Information Technology, Computer Science and Library & Information Science and one-yr. Bachelor and Master degree programs in Physical Education and many other disciplines.

The one year Postgraduate Diploma may lead to admission to Final year Master’s degree in the relevant discipline.

**Faculties and Constituent Centres/ Institutes & Departments of the University of Sindh**

**Faculty of Arts**
1. Institute of Arts & Design
2. Institute of English Language & Literature
3. Institute of Languages (Arabic & Persian)
4. Department of Philosophy
5. Department of Sindhi
6. Department of Urdu

**Faculty of Commerce & Business Administration**
1. Institute of Business Administration
2. Institute of Commerce

**Faculty of Education**
1. Department of Curriculum Development & Special Edu.
2. Department of Distance, Continuing and Computer Edu.
3. Department of Education
4. Department of Educational Management and Supervision
5. Department of Psychological Testing, Guidance & Research
6. Department of Science and Technical Education.

**Faculty of Islamic Studies**
1. Department of Comparative Religion & Islamic Culture
2. Department of Muslim History

**Faculty of Law**
1. Institute of Law

**Faculty of Natural Sciences**
01. National Center of Excellence in Analytical Chemistry
02. Centre for Environmental Science
03. Centre for Health and Physical Education Sports Science
04. Centre for Pure & Applied Geology
05. Institute of Biochemistry
06. Institute of Biotechnology & Genetic Engineering
07. Dr. M.A. Kazi Institute of Chemistry
08. Institute for Advanced Research Studies in Chemical Sciences.
09. Institute of Information & Communication Technology
10. Institute of Mathematics & Computer Science
11. Institute of Plant Sciences
12. Institute of Physics
13. Department of Anthropology & Archaeology
14. Department of Freshwater Biology & Fisheries
15. Department of Geography
16. Department of Microbiology
17. Department of Physiology
18. Department of Statistics
19. Department of Zoology

**Faculty of Pharmacy**
01. Department of Pharmaceutics
02. Department of Pharmaceutical Chemistry
03. Department of Pharmacology
04. Department of Pharmacognosy

**Faculty of Social Sciences**
01. Sindh Development Studies Centre
02. Pakistan Studies Centre
03. Institute of Women Development Studies
04. Department of Economics
05. Department of General History
06. Department of International Relations
07. Department of Library Information Science & Archive Studies
08. Department of Mass Communication
09. Department of Political Science
10. Department of Psychology
11. Department of Public Administration
12. Department of Sociology
13. Department of Social Work
14. Department of Criminology
MS / M.Phil & Ph.D PROGRAMS

FACULTY OF ARTS
M.Phil / Ph.D Arabic
M.Phil / Ph.D English
M.Phil / Ph.D Sindhi
M.Phil / Ph.D Urdu

FACULTY OF COMMERCE & BUSINESS ADMINISTRATIONS
MS / M.Phil / Ph.D Commerce
MS / M.Phil / Ph.D Business Administration

FACULTY OF EDUCATION
M.Phil / Ph.D Education

FACULTY OF ISLAMIC STUDIES
M.Phil / Ph.D Comparative Religion & Islamic Culture
M.Phil / Ph.D Muslim History

FACULTY OF NATURAL SCIENCES
MS. / M.Phil / Ph.D Analytical Chemistry
MS. / M.Phil / Ph.D Bioinformatics
MS. / M.Phil / Ph.D Biotechnology
MS. / M.Phil / Ph.D Botany
MS. / M.Phil / Ph.D Chemistry
MS. / M.Phil / Ph.D Computer Science
M.Phil Environmental Sciences
MS. / M.Phil / Ph.D Freshwater Biology & Fisheries
MS. / M.Phil / Ph.D Geology
MS. / M.Phil / Ph.D Information Technology
MS. / M.Phil / Ph.D Mathematics
MS. / M.Phil / Ph.D Microbiology
MS. / M.Phil / Ph.D Physiology
MS. / M.Phil / Ph.D Physics
MS. / M.Phil / Ph.D Statistics
MS. / M.Phil / Ph.D Zoology
M.Phil / Ph.D Physical Education, Health & Sports Sciences

FACULTY OF PHARMACY
M.Phil / Ph.D Pharmaceutics
M.Phil / Ph.D Pharmaceutical Chemistry

FACULTY OF SOCIAL SCIENCES
M.Phil / Ph.D Development Studies
MS./M.Phil / Ph.D Economics
MS./M.Phil Gender Studies
M.S./ M.Phil Mass Communication
M.Phil / Ph.D International Relations
M.Phil / Ph.D Political Science
M.Phil M.Phil / Ph.D M.S./ M.Phil / Ph.D M.S./ M.Phil / Ph.D
Pakistan Studies Psychology Public Administration Sociology

Note:

i. Ph.D Program is restricted to disciplines where at least three regular faculty have Ph.D degrees.

ii. If number of students enrolled in MS / M.Phil. program in any discipline is less than 10, the program shall not be started.
AUTHORITIES OF THE UNIVERSITY

As per Charter of the University, following are the authorities of the University:

1. Senate
2. Syndicate
3. Academic Council
4. Board of Faculties
5. Board of Studies
6. Selection Board
7. Advanced Studies and Research Board
8. Affiliation Committee
9. Finance & Planning Committee
10. Discipline Committee

SYNDICATE

The Syndicate vested with executive authority, presently comprises the following members. The tenure of office of members other than Ex-officio members, is three years.

Chairman: Prof. Dr. Nazir Ahmed Mughal, Vice-chancellor,

Members
02. Prof. Dr. Anwar Ali Shah G. Syed, Pro-Vice-Chancellor, Sindh University Campus, Dadu
03. Prof. Dr. Imdad Ali Ismaili, Pro-Vice-Chancellor, Sindh University Campus, Mirpurkhas
04. Mr. Justice Abdul Rasool Memon, Judge, High Court of Sindh, Karachi
05. The Secretary, Education & Literacy Department, Government of Sindh, Karachi. (or his Nominee)
06. The Chairman, HEC (or his nominee)
07. Mr. Jhamat Jethanand, Dean, Faculty of Law, University of Sindh, Hyderabad.
08. Prof. Dr. Sarfraz Hussain Solangi, Director Centre for Pure & Applied Geology, University of Sindh. Focal Person, Sindh University Thatta Campus
09. Dr. Ghulam Murtaza Mastoi, Associate Professor Dr. M.A. Kazi Institute of Chemistry, University of Sindh
10. Mr. Badaruddin Soomro, Assistant Professor Department of Mass Communication, University of Sindh
11. Mr. Imran Ali Halepoto, Lecturer Institute of Physics, University of Sindh
12. Mr. Justice (Retd) Hamid Ali Mirza, B 1/1, 10th Street, Gulshan-e-Faisal, Cooperative Housing Society, Both Island, Karachi.
13. Mr. Raees Ahmed Khan, Chief Executive, Nazeer Hussain Institute of Emerging Science, Mirpurkhas
14. Prof. Dr. Asadullah Larik, Appartment C-4, Building No.43, Street No. 28, Askari-5, Malir Cantt, Karachi.
15. Prof. Ahmed Ali Shaikh,  
Principal, Government Sindh Law College, Hyderabad.

16. Prof. Dr. Abdul Sattar Ansari,  
D-517, Shamanabad, Sukkur

17. Prof. Dr. Mumtaz Bhutto,  

18. Mr. Ghulam Muhammad Bhutto  
Registrar/Secretary, University of Sindh.
UNIVERSITY TOWN JAMSHORO
AT A GLANCE

Jamshoro, the largest University residential campus in the country, situated about 17 km. from Hyderabad on the right bank of River Indus, was a rather desolate hilly track until 1955 when it was selected for the establishment of Sindh University Campus. The site was selected to be a University township away from the humdrum of Hyderabad city which lacked room to meet the ambitious expansion program of the University.

Interestingly, Jamshoro is virtually the gate-way to the Indus Valley, now world famous for its civilization and rich cultural heritage. The Ranikot Fort is located approximately 70 kms to the north of the campus, in the northward continuation of the same hilly track which become Laki Ranges, merging with the Khirthars northwards. Amri, an important archeological site, lies about 15 kms. further north. Sehwan, a well known township lies 25 km. to the north of Amri. Mancher Lake the largest fresh water lake in the region, is situated to the west north west of Sehwan. Travelling about 150 kms. north through the Indus plains brings one to the site of Moen-jo-Daro, the most important archeological discovery of the Valley.

The development programs initiated in 1959 have gradually though slowly borne fruit. Though still in progress, over the years about 24 teaching blocks, Arts Faculty Building, & Elsa Kazi Campus housing 57 institutes, departments and centres. Sixteen halls of students residence provide accommodation in 10 hostels to about 2500 boys and 1500 girls are accommodated in five hostels for girls. A separate hostel has been recently completed for Postgraduate girls students. A beautiful pavilion-the Hyder Bux Jatoi Pavilion has been constructed to provide indoor games facility, track for athletics and sports grounds. Fatima Jinah Gymnasium provides games and sports facility exclusively for girls. The Institute of Sindhology building, depicting the cultural heritage of Sindh, adores the entrance to the campus from the Indus Highway. The imposing central library building, named after Late Allama I. I.Kazi, the first Vice-chancellor of the University at Hyderabad, who conceptualized this campus, serves as a land mark even from a distance. The campus itself has been named as Allama I.I. Kazi Campus as a tribute to the great scholar and visionary.

The residential colony for the faculty and staff of the University provides on- campus residence to about one third of the total employees.

The tree lined roads and greenery developed at the campus has completely transformed the Campus. The location of Sindh University sharing area with the Mehran University of Engineering & Technology and Liaquat University of Medicine & Health Sciences/ complex in the neighborhood, has gone a long way in this transformation to a University township. The University provides easy accessibility and facilitates in organizing National-International Conferences, Symposia and Seminars on variety of themes related to all disciplines offered by the university. Intervarsity sports competitions and annual sports meets have become regular features. Our graduates, perform above par in those competations and win prizes proving their potential and interest. The museum and various art galleries of the Institute of Sindhology attract a large number of visitors. Recently, constructed Shaheed Muhtrama Benazir Bhutto Convention Centre will be a major add in carrying out applied and academic research in future.
REGULATIONS FOR REGISTRATION TO RESEARCH STUDIES LEADING TO THE DEGREE OF M.S / M.PHIL

1- PRE-QUALIFICATION
(i) Candidates with a minimum 16 years of schooling, possessing at least second class Master’s degree or 4-year Bachelor degree of the University of Sindh OR of a University / Institute recognized by the Higher Education Commission, in the relevant subject & qualifying pre-admission test, may be allowed to seek enrolment for Research Studies which may lead to the degree of M.PHIL / MS(after 4 year Bachelor)
(ii) Candidate may be allowed enrolment for the degree of Master of Philosophy (M.Phil/ MS.) in the relevant subject studied by the candidate at the Master’s/ BS degree level.

2- NATURE OF DEGREE
(i) The degree shall be by coursework of 24 CH for two semesters and partial thesis of 16 CH from 2nd to 4th Semester.
(ii) The thesis should be a piece of work embodying either a discovery of new facts or a fresh interpretation of facts or theories; in either case the work should show the candidate’s capacity for critical examination and judgment.
(iii) The standard of the research work which indicates the standard of thesis submitted for the M.Phil/ MS. degree may be lower than the standard for the Ph.D. degree of this University and higher than that of Master’s degree.

3- DURATION OF THE DEGREE
(i) The M.Phil/ MS. program will be of a minimum of two years (four semester) duration, comprising mainly coursework of 16 CH during the first semester and 8 CH courses during the 2nd semester, besides thesis research on the topic duly approved by the Advanced Studies and Research Board, on the recommendations of the supervisor and Scrutiny Committee. Candidate will have to score CGPA 3 or more to qualify coursework, before submission of thesis.

However, for promotion from 1st to 2nd semester, the candidates will have to score minimum GPA 2 at the end of 1st semester. If the GPA is less than 2, then his/ her enrolment will be terminated.

(ii) M.Phil/ MS. Research topic will be assigned to candidates on successful completion of 1st semester and the research work will be started in 2nd semester alongwith study of two courses.

(iii) The degree shall be awarded on completion of 24 CH coursework with a minimum CGPA 3 and successful defence of the research thesis. If candidate fails to secure CGPA3 he/ she will have to improve the CGPA to 3 or above within the two years, before submission of thesis. The candidate will have to score credits from a total of 40 CH for the award of degree; the thesis research and its defence is assigned 16 credits.

4- REGISTRATION REQUIREMENTS / PROCEDURE
i- Enrollment may be conducted once a year in October/November for Spring Semester of the ensuing year a year (in December and July) for Spring and Fall semester. In exceptional case the Vice-Chancellor may allow twice a year OR provisional enrolment at any time subject to qualifying Pre-Entry Test.

ii- Candidates fulfilling the pre-requisite for admission to M.Phil/ MS. program shall submit application on prescribed form to the Director/ Chairperson of the Institute/ department/ centre concerned. The application for enrollment shall be accompanied by the following documents:
   a. Two attested copies of the recent passport size photographs.
b. Attested copies of the Pass & Marks certificate of last qualifying examinations

c. Attested copy of Computerized National Identity Card

d. Eligibility Certificate (wherever necessary)

e. Service Certificate and No Objection/ Spare ability Certificate from the employer (in case of in-service candidate)

**NOTE:** In service, candidates will have to obtain minimum one-year leave from parent departments to complete 2 semesters research coursework.

iii. All students seeking enrolment to M.Phil./ MS. in any discipline will have to qualify pre-admission test to be conducted by the University Testing Service. The test will be GRE (subject) type and based on MCQs, covering English (25%), Simple Maths (15%) and subject (60%) questions. Applicants who may have qualified NTS/ GRE General Test, in case of enrolment in Humanities and Social Science disciplines, [GRE (subject) in case of enrolment in Natural Science disciplines] earlier, will be exempted from writing the Test, but they will have to appear for the interview.

vi. The Pre-Admission Test to be administered by Sindh University Testing Service, will be of 40 marks and interview of 20 marks; 40 marks are assigned to previous academic record from S.S.C. to the Master’s degree with a break-up as under:

<table>
<thead>
<tr>
<th>Qualification</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matric / S.S.C.</td>
<td>05</td>
</tr>
<tr>
<td>Intermediate / H.S.C.</td>
<td>05</td>
</tr>
<tr>
<td>Bachelor degree</td>
<td>10</td>
</tr>
<tr>
<td>Master degree</td>
<td>20</td>
</tr>
</tbody>
</table>

Qualifying marks in Pre-Admission Test are 50% (20 marks out of 40)

v. The interview will be given by the Evaluation Committee of the Centre/ Institute/ Department comprising:

a. The Dean
b. The Director / Chairperson
c. Three Professors (and /or Associate Professors/ Assistant Professors to make up the number) of the concerned centre/institute / department.

vi. The names of the candidates recommended for enrollment by the Evaluation Committee of the Discipline, will be communicated by the Director / Chairperson to the Director Graduate Studies, who will inform the candidates accordingly.

vii. Every student shall pursue his / her research at Centres/Institutes / Departments and other Institutions within the jurisdiction of the University of Sindh and duly recognized for this purpose by the Advanced Studies and Research Board.

5- REGISTRATION BY THE ADVANCED STUDY RESEARCH BOARD, APPROVAL OF , TOPIC AND SUPERVISOR/GUIDE

i. (a) M.Phil/ MS. candidates will, on completion of 1st semester coursework with GPA 2 or above, submit the request on prescribed form for Registration, approval of the research topic and appointment of Supervisor/ Guide to the Director Graduate Studies through the proposed supervisor, Director/ Chairperson of the Institute / Department / Centre and concerned Dean, for processing & submission to Advanced Studies and Research Board through Scrutiny Committee concerned.

Seven copies of research synopsis of not more than 700 words, should be submitted alongwith the application form.

(b) (i) M.Phil/ MS. candidates failing in 1st semester coursework with GPA less than 2, will not be allowed to continue. However, candidates scoring GPA 2 or above but less than 3.0, will be allowed to re-appear and improve the CGPA to 3 or above, on payment of prescribed fee alongwith 2nd semester coursework/ before the submission of thesis.

Candidates qualifying 1st semester coursework but not continuing for the 2nd semester for remaining courses, for any reason, may resume study and thesis research work within two years of completion.
of 1st semester coursework otherwise their enrollment will be cancelled and they will have to repeat all courses, if seeking re-enrolment.

(ii) The registration for research study shall be effective from the date of commencement of second semester/ date of approval of the topic; the topic of M.Phil/ MS. thesis, is to be approved by the Advanced Studies & Research Board on the recommendation of the Supervisor countersigned by the Director/ Chairperson, the Dean and the Faculty Scrutiny Committee as constituted for this purpose by the Board for a subject or a group of subjects.

The Scrutiny Committee may consist of:

i. The Dean of the Faculty
ii. Director / Chairperson of the institutes /departments / centres concerned (wherever available).
iii. One Senior most Professor other then Chairperson from the concerned Institute / Department / Centre.
iv. Two Professors of any relevant field from outside the institute / department / centre to be appointed by the Dean.
v. Supervisor
vi. Director Graduate Studies

The Committee shall examine the viability of topic of research, its scope and the facilities available. It shall also scrutinize application for appointment/change of guide and co-guide, revision of topic as well as transfer of registration to Ph.D. etc.

6- GENERAL REGULATIONS

(i) M.Phil/ MS. students in various Faculties, i.e., Natural Sciences, Pharmacy, Arts, Commerce and Business Administration, Social Sciences and Islamic Studies will have to be full time research students for the minimum period of not less than one calendar year in the centre/ institute/ department concerned. In-service candidates will have to obtain study leave at the directive of the Supervisor/ Guide.

The Supervisor/ Guide concerned shall issue such certificate of attendance alongwith the thesis, when submitted for evaluation.

(ii) No student shall without the prior permission of the Advanced Studies and Research Board, join any other course of study OR appear at any other examination conducted by any University, during the period he / she is continuing registration for research work for the M.Phil./ MS. Degree.

7- SCHEDULE OF FEES:

All the research students will have to pay the prescribed fees as approved by the authorities from time to time (see page # 15).

(i) Sindh University teachers are exempted from payment of supervision / tuition fee alongwith other fees. However, as per decision of the concerned authority, after a maximum period of 2 years, the exemption will be withdrawn and full supervision / tuition fee will be charged for the additional period.

(ii) Research Associates working in the University are exempted from payment of supervision / tuition fee & Bus fare. However, after maximum period of 2 years, the exemption will be withdrawn and full supervision fee will be charged as approved by the authorities.

(iii) Teachers of degree colleges affiliated with the University of Sindh, are allowed 50% concession in tuition fee. However, after maximum period of 2 years the concession will be withdrawn and full supervision / Tuition fee will be charged.

8- GUIDANCE OF RESEARCH

The Advanced Studies and Research Board shall appoint a Supervisor (and Co-supervisor wherever deemed necessary) for research scholars.
The Supervisor for guiding the research scholar and Co-guide (if from teaching department/college) for the degree of M.Phil/MS. must possess the following minimum qualification:

(i) All teachers recognized as guide for Ph.D. research can also guide M.Phil. research students.

In other case:

(ii) A supervisor for guiding research scholars leading to award of M.Phil/MS. degree shall at least be:

- An Assistant Professor of the University, with Doctorate Degree.
- Assistant Professor on Tenure Track appointment.
- All HEC approved Supervisors

While recommending appointment of supervisor, the Scrutiny committee should also consider his/her specialization’s relevance vis-à-vis topic of research.

(iii) Co-Supervisor/Co-guide is a Teacher/Researcher or an expert who has adequate professional experience in the relevant field of research. In case of collaborative research with the approved Institutes/Organizations, the Supervisor will have to be from the University Centre/Institute/Department and Co-Supervisor/Co-guide shall be taken from the collaborative Institute concerned.

(iv) Not more than 4 MS./M.Phil. research scholars shall be registered under the guidance of one Supervisor in one academic year, provided that the total number of scholars pursuing research under his/her guidance, does not exceed 10, at any time.

9- MODIFICATION / CHANGE OF RESEARCH TOPIC

(a) A candidate may within one Calendar year of the registration modify/change the topic of his/her research with the approval of the Advanced Studies and Research Board on submitting an application duly supported by the Supervisor, the Chairperson/Director, the concerned Dean and recommended by the Scrutiny Committee.

(b) The final title of the thesis shall be approved by the Advanced Studies and Research Board not less than six months before the submission of thesis.

10- TRANSFER TO Ph.D.

If at the end of 2nd semester, after qualifying prescribed courses of 24 CH with CGPA 3 or above and successful presentation of one departmental seminar and qualifying GRE (Subject) Test, the Supervisor of Research scholar recommends through the Chairperson/Director and the concerned Scrutiny Committee to the Advanced Studies and Research Board, the candidate may be transferred and registered for Ph.D. degree with the condition that he/she shall have to submit the revised/fresh synopsis for the Ph.D. degree level research alongwith transfer request, specifying the additional work to be carried out for Ph.D. study. The revised synopsis should specify the additional research coverage (not just number of chapters) justifying transfer to Ph.D.

11- CHANGE OF SUPERVISOR

(i) In case the candidate desires to change his/her supervisor/guide he/she shall have to apply through his/her Chairperson/Director and the Dean concerned. The “No Objection Certificate” from the present and the proposed supervisor/guide is necessary. The ground for such a request shall be clearly specified. If the original guide is not accessible or does not respond, then the ASR Board may decide the case on its own.

(ii) If the Supervisor is not satisfied with the progress of the candidate, he may at any time recommend through Director/Chairperson and the Dean to the Board for cancellation of registration. The decision of the Board shall be final and binding.

12- PRE-REQUISITE FOR SUBMISSION OF THESIS

(i) The candidate shall give at least two seminars on the topic of his/her research to be chaired by the Dean of the Faculty during the course of his/her study. The report of seminar will be submitted by the Dean.

(ii) The coursework must have been qualified with CGPA 3 or above.
(iii) The Supervisor shall submit progress report of research scholar after every 6 months which may be placed before the Board.

13- SUBMISSION OF THESIS

(i) The candidate shall be eligible to submit his/her thesis after completing three semester full time research from the date of registration with the Board. The period may be extended in case of genuine hardship. However, no extension shall be granted after the expiry of the 3RD year and the registration shall be cancelled without any notice/intimation.

(ii) Such candidates may however, be re-registered subject to recommendation by the Supervisor, provided the request for re-registration is made immediately on or before expiry of the 3-year maximum period. In case of re-registration, the M.Phil/MS, thesis will have to be submitted within one year; No change of status will be permissible during this grace period. In case of failure to comply, the candidate’s registration shall be terminated for good.

(iii) The language of the thesis in case of Faculties of Natural Sciences, Arts, Education, Commerce & Business Administration, Social Sciences and Law shall be English only. However, in case of research in Oriental languages and Islamic studies, the thesis may be written in a language approved by the Advanced Studies and Research Board.

(iv) The thesis, which is submitted in a language other than English, e.g., Islamic Culture and Religion etc., must have a summary of the thesis written in English as well.

(v) The thesis will be initially submitted for evaluation with loose/spring binding. It should be of A-4 size, computer typed, printed in TIMES NEW ROMAN 12 Font for the running text and the page with 1.5" margin on the left and 1" margin on the other three sides and line spacing 1.5. Its title cover of light creamcolour should of standard format.

The thesis should not be more then 200 pages in case natural Science discipline & 250 pages in case of Arts, Education, Islamic Studies & Social Sciences disciplines.

Four copies of the thesis shall be submitted for evaluation alongwith copy on CD to the Controller of Examinations.

The thesis must bear certificate from the Supervisor(s) to the effect that the thesis embodies original research and is worthy of presentation to the University for the award of MS./ M.Phil. degree.

Following acceptance for the award of degree, four copies of thesis having hard binding cover of light Cream colour, shall be submitted by the candidate in the format prescribed by the University authorities, before issuance of any certificate.

14- AWARD OF DEGREE

All theses submitted for evaluation shall be initially referred by the Controller of Examinations to the Focal Person to detect plagiarised content if any. On receipt of clearance certificate, it shall be processed as under:

(i) The thesis shall be referred for evaluation to one external examiner to be appointed by the Advanced Studies & Research Board, and the research supervisor, who shall be internal examiner.

(ii) The Controller of Examinations shall submit the evaluation reports of the examiners and the viva-voce examination report to the Advanced Studies and Research Board which shall decide whether the MS/M.Phil. degree be awarded to the candidate.

(iii) For approval of award of MS/M.Phil. degree both evaluation reports of the thesis must be positive.

15- HONORARIUM TO RESEARCH SUPERVISOR

The University has decided to pay honorarium of Rs. 15000 to supervisors as well as co-supervisors, on successful completion of every M.Phil/MS study as an incentive. Where co-supervisors are associated, the amount will be divided @ 60:40 among supervisor & co-supervisor. Where more than one supervisor/co-supervisors are involved the amount will be shared equally.
REGULATIONS FOR REGISTRATION TO RESEARCH STUDIES LEADING TO THE AWARD OF DEGREE OF PH.D

1. PRE-QUALIFICATIONS:
   1. The degree of Doctor of Philosophy may be awarded in any subject taught in the University of Sindh and its affiliated Colleges/Institutions.
   2. A candidate possessing MS/M.Phil. of the University of Sindh OR of a University recognized by the University of Sindh and having cleared International GRE (Subject) Test, may be allowed to seek registration for research studies which may lead to the Ph.D. degree. However, a candidate holding Master's degree shall be initially registered for M.Phil. degree and subject to qualifying MS/M.Phil. 24 CH coursework with CGPA 3 or above can later be considered for transfer to the Ph.D. program, provided International GRE (Subject) Test has been cleared. The Scrutiny Committee of the Faculty after examining the merit of the case shall submits its recommendations to the Advanced Studies & Research Board. The registration of the candidate shall be transferred for Ph.D. degree on the recommendation of the supervisor and the Scrutiny Committee with the condition that he/she shall have to submit fresh Synopsis specifying additional research to be carried out. Synopsis should not be of more than 1000 words.
   3. A candidate who has obtained a pre-requisite degree from the country other than Pakistan may first obtain the Equivalence of his/her degree from the University of Sindh / HEC, Islamabad.

2. NATURE OF DEGREE:
   The Ph.D. degree is earned through 42 CH coursework (24 CH of MS/M.Phil + 18 CH of Ph.D) and thesis / dissertation on topic duly approved by the Advanced Studies and Research Boards.
   1. It shall be a research degree mainly by research work on the topic duly approved by the Advanced Studies & Research Board. The candidate who have qualified 24 CH MS/M.Phil coursework (or 18-yr of schooling) will have to study and qualify 18CH coursework of Ph.D. and qualify the comprehensive written and oral Examination. The Candidate may then apply for admission to candidacy to Ph.D and approval of topic of research and appointment of Supervisor, to the Advanced Studies and Research Board, through the Supervisor, the Dean and Securing Committee. On completion of research, the findings will be presented for defense of thesis Seminar open to general public.
   2. The thesis should be a piece of work embodying either a discovery of new facts or a fresh interpretation of facts or theories; in either case the work should show the candidate’s capacity for synthesis of data, its critical examination and judgment.
   3. The standard of the research embodied in the thesis must be higher than that of M.Phil. thesis.

3. REGISTRATION REQUIREMENT:
   1. Every scholar shall pursue his/her research at Institute/Department/Centre and other Institutions within the jurisdiction of the University of Sindh and duly recognized for this purpose by the Advanced Studies & Research Board.
   2. Every Ph.D. candidate shall submit the prescribed application form, duly filled, recommended and signed by the supervisor and countersigned by the Director/Chairperson and the Dean concerned.
   3. The application form for registration shall be accompanied by research synopsis of not more than 1000 words specifying outline of the topic, justification and scope of research, research plan and bibliography (in English). Following documents are to be attached:
      • Two attested copies of recent passport size photographs.
      • Attested copy of the Certificate of last qualifying examination.
      • Attested copy of the National Identity Card.
      • Eligibility Certificate (wherever necessary) issued by the University of Sindh.
      • Copy of Enrolment Card issued by the University of Sindh.
      • Service Certificate alongwith No Objecton/Spaee-ability Certificate (wherever applicable).
4. The registration shall be effective from the date of approval by the Advanced Studies & Research Board on the recommendation of the supervisor, the Director/Chairperson and the Scrutiny Committee as constituted for this purpose by the Board for a subject or a group of subjects.

5. The Scrutiny Committee may consist of:
   i. The Dean of the Faculty.
   ii. Director/Chairperson of the concerned Institute/department.
   iii. One senior most Professor other than Director/Chairperson from the concerned Institute/Department.
   iv. Two Professors of any relevant field from outside the Institute/Department/ Centre to be appointed by the Dean.
   v. Supervisor.
   vi. Dean / Director Graduate Studies.

6. Ph.D. students in the Faculties of Natural Sciences, Arts, Commerce & Business Administration, Islamic Studies and Social Sciences, shall have to be fulltime research student for the minimum period of not less than two calendar year in the institute/department concerned.

7. The supervisor of the candidate shall issue a certificate of attendance alongwith the thesis, when submitted for evaluation.

8. No student shall without the prior permission of the Advanced Studies & Research Board, join any other course of study or take any examination conducted by any University, during the period he/she is continuing registration for research work for the Ph.D. degree.

4. FEES:
   All research students will have to pay the fees as prescribed by the authorities from time to time. (see Appendix)
   i. Sindh University teachers are exempted from payment of tuition fees but will have to pay thesis Evolution and Viva Examination fee. Further, as per decision of Advanced Studies & Research Board after a maximum period of 3 years, the exemption mentioned above will be withdrawn and full tuition/supervision fee will be charged.
   ii. Research Associate Teaching Assistants working in the University and enrolled for Ph.D. study are exempted from payment of tuition fee and bus fare. However, after maximum period of 3 years the exemption will be withdrawn and full tuition fee will be charged for additional period.
   iii. 50% concession in tuition fee only is allowed to teachers of affiliated degree colleges. However, after maximum period of 4 years the concession will be withdrawn and full tuition fee will be charged for addition period.

5. GUIDANCE OF RESEARCH:
   1. The Advanced Studies & Research Board shall appoint a supervisor/guide (and co-supervisor/ co-guide wherever deemed necessary) for research scholars.
   2. The supervisors for guiding the research scholars and co-supervisors/co-guides (if from teaching department/college) for the degree of Ph.D. must possess the following minimum qualifications.
      i. He/she be either a Professor and Associate Professor or HEC approved supervisor and including Emeritus and Retired Professors of University of Sindh or of an Institute recognized by the University of Sindh.
      ii. All University Professor/Associate Professor are recognized as approved guide in their respective field of specialization. While approving their appointment in a specific case, their own specialization and its relevance to the topic should be considered. This also applies to subclause III & IV hereunder.
      iii. Assistant Professor holding Ph.D. degree with 7 years experience of teaching and having at least three years experience of teaching in the relevant discipline after the Doctorate degree Or HEC approved supervisor Or Assistant Professor on Tenure Track.
      iv. Lecturers with Ph.D. who are approved as Supervisor by the HEC.
      v. Co-guide is a teacher, researcher or an expert who has adequate professional experience in the relevant field of research.
      vi. In case of collaborative research with the approved Institutes/Organizations, the supervisor shall have to be from the University Institute/Department and co-guide shall be taken from the collaborative Institute concerned.
vii. Not more than four research scholars shall be registered under the guidance of one supervisor in an academic year, provided that the total number of research scholars working him/her does not exceed 05 with (08th exceptional cases), at a time.

6. MODIFICATION / CHANGE OF RESEARCH TOPIC:
1. A candidate may within one calendar year of registration, modify/change the topic of his/her research with the approval of the Advanced Studies & Research Board on submitting of an application alongwith revised synopsis duly recommended by the Supervisor, countersigned by the Director/Chairperson and the Dean and endorsed by the Scrutiny Committee. In cases of change of topic the Board shall determine the minimum time after which the thesis may be submitted.
2. The final title of the thesis shall be approved by the Advanced Studies & Research Board not less than six months before the submission of thesis.

7. CHANGE OF SUPERVISOR:
1. In case the candidate desires to change his/her supervisor/guide, he/she shall have to apply through his/her Director/Chairperson and the Dean concerned. The “No Objection Certificate” from the present and the proposed supervisor/guide is necessary. The ground for such a request shall be clearly specified. If the original guide is not accessible or does not respond, then the Board may decide the case on its own.
2. If the supervisor is not satisfied with the progress of the candidate, he may at any time recommend to the Board for cancellation of registration or, relegation to M.Phil. The decision of the Board shall be final and binding.

8. PRE-REQUISITE FOR SUBMISSION OF THESIS:
1. The candidate shall conduct one seminar/presentation on the topic of his/her Ph.D. research on completion of study in defense of his/her thesis. This will be open to general public. The departmental Research Committee may however direct the candidate to conduct seminar, for monitoring his/her research progress during the course of his/her study at faculty level meeting to be chaired by the Dean concerned. The final seminar will be presided over by the Vice-Chancellor. The Dean shall issue evaluation report of the seminar presentation.
2. The supervisor shall submit progress report of the research scholar through the Director/Chairperson after every six months which shall be placed before the Board.

9. VOLUNTARY TRANSFER TO M.PHIL. DEGREE:
If for any personal reason, a candidate registered for Ph.D. studies wishes to get his registration changed to M.Phil. degree program, the Board may allow him/her to do so provided minimum requirement for M.Phil. is fulfilled and the request is duly supported by the supervisor/guide, the Director/Chairperson and the concerned Dean and is recommended by the Scrutiny Committee three months before the submission of thesis.

10. SUBMISSION OF THESIS:
1. The candidate shall be eligible to submit his/her thesis after completing two calendar year fulltime from the date of registration. This is subject to extension, if recommended by the supervisor, for an other two years. No extension shall be granted after the expiry of the 5th year and the registration shall be cancelled.
2. Such candidates may however be re-registered on request specifying valid ground. However, in case of re-registration the thesis will have to be submitted within two years from the date of expiry of initial 5 years period; in case of failure to comply, the candidates registration shall be terminated for good.
3. The language of the thesis in case of disciplines under the Faculties of Natural Sciences, Arts, Education, Commerce & Business Administration, Social Sciences and Law shall be English language only. In case of Islamic Studies and Languages, the thesis may however be written in a language approved by the Advanced Studies & Research Board.
4. The thesis should not be more than 250 pages (including Appendix) in case of Natural Sciences discipline and not more than 300 pages in case of humanities and languages. The thesis which is submitted in a language other than English, e.g. in Islamic Culture and Religion etc., must have a summary of the thesis written in English as well.
5. The thesis will be initially submitted for evaluation with loose binding. It should be on A-4 size computer typed, printed in TIME NEW ROMAN 12 sized font for the running text and the page with 1.5” margin on the left and 1” margin on the other three sides and line spacing 1.5. Hard bound copies of the thesis will have to be submitted on declaration of result without which no certificate will be issued. The thesis title page should be in conformity with the standard format. The words "Ph.D thesis ___(year)____" should also be printed on the spine of thesis in vertical lettering on the hard-bound copies of the thesis. The title cover/wrapper should be of light blue colour. The ‘Contents’ list of the thesis should also be in conformity with the standard format.

6. The thesis must bear certificate from the supervisor(s) to the effect that the thesis embodies original research and is worthy of presentation to the University for the award of Ph.D. degree. It should include an abstract of the study of not more than 500 words.

7. A softcopy (Floppy/CD) of the thesis must also be submitted along with loose bind copies, to check for plagiarism, which is mandatory.

11. EVALUATION OF THESIS:
   1. The Board of Studies of the relevant discipline shall recommend the panel of at least 12 (twelve) names (6 from academically advanced foreign countries and 6 from within Pakistan). Out of which the Advanced Studies & Research Board shall appoint two external examiner from outside of Pakistan and two from within the country, except in-service/retired teachers of the University of Sindh or College/Institutes within the jurisdiction of the University of Sindh, to examine and evaluate the thesis.
   2. The supervisor will be internal examiner.
   3. The external examiners from outside Pakistan shall be paid token honorarium to cover postage, to be fixed from time to time.
   4. On appointment of examiners, the Controller of Examinations shall send the copies of the thesis to examiners for evaluation and on receipt of revaluation reports, shall arrange the vice-voce examination of the candidate.

12. AWARD OF DEGREE:
   1. The Controller of Examinations shall submit the thesis evaluation, Public Defense of thesis, and viva-voce examination reports before the Advanced Studies & Research Board, which may take any of the following appropriate decision.
      i. To reject the thesis, if the two examiners from outside Pakistan have agreed that the thesis is not adequate.
      ii. To permit the candidate to resubmit his/her thesis in a revised form as per suggestion/instruction of the examiners within a period of one year, or to recommend the award of M.Phil., if at least one of the foreign examiner and two other External Examiners within Pakistan have recommended that the thesis though not adequate for Ph.D. degree, is of sufficient merit to deserve consideration for the award of M.Phil. degree on resubmission.
      iii. To recommend the award of Ph.D. degree to the candidate, if one external examiner from outside of Pakistan and two other examiners from within Pakistan, have recommended that the thesis adequately fulfills the requirements of Ph.D. degree.
      iv. In case of viva-voce examination of Ph.D. thesis presence of two examiners who evaluated the thesis within Pakistan shall be deemed sufficient provided that all the evaluation reports of the thesis are positive. The University may where and when possible arrange viva-voce through Video Conferencing to include foreign examiners as well.
      v. In case a thesis submitted for Ph.D. degree is found to be of M.Phil. standard only, the Advanced Studies & Research Board on the recommendations of the examiners, may recommend award of M.Phil. degree to the student.

13. HONORARIUM TO RESEARCH SUPERVISOR(S):
The University of Sindh has decided to pay honorarium to supervisor(s) as well as co-supervisor(s) on successful completion of every Ph.D. study as an incentive. It is proposed to allow Rs.30,000/- as honorarium for Ph.D. research. Where co-supervisor(s) are associated, the amount will be divided @ 60:40 among supervisor and co-supervisor. Where more than one supervisors/co-supervisors are involved, the amount will be shared equally, among them.

The Regulations are subject to approval of the Academic Council
FEES FOR MS/M.Phil. PROGRAM - 2014 ONWARD

A. For Local Students
   a) Registration Fee Rs. 5000.00
   b) Tuition Fee for Coursework Rs. 12000.00
   c) Supervision Fee Rs. 15000.00
   d) i) Utilities Charges Rs. 4000.00
      (Computer, Lab, Library)
   ii) Thesis evaluation fee Rs. 4000.00
   ______________________________________
   Rs. 40000.00
   
   Note: i.e Rs. 10,000 per semester Package for 2 years; 4 installments permissible

B. For Foreign Students $ 1200.00

C. Other Fees for all:
   i) Viva Voce Examination Fee Rs. 10000.00
   ii) For improvement of GPA Rs. 2000.00 Per appearance
   iii) Transfer to Ph.D. Rs. 2000.00
   iv) Re-Registration Fee Rs. 1000.00

REVISED FEES SCHEDULE FOR Ph.D PROGRAM - 2014 ONWARD

A. For Local Students
   a) Registration Fee Rs. 5000.00 (once only)
   b) Tuition 06 (Six) semester Rs. 24000.00
   c) Supervision Rs. 30000.00
   d) Library / Identity Card / Lab / Rs. 4000.00 Computer / Utilities Charges
   e) Thesis evaluation Rs. 10000.00
      (by 2 Pakistani + 2 foreign experts)

B. For Foreign Students package, $ 2000.00 per year
   including above:
   f) Examination fee Rs. 20000.00
      (to be paid at the time of submission of the thesis)
      (Two Pakistani examiners to conduct viva voce)
   g) Re-registration fee Rs. 1000.00
   h) fee for improvement of GPA Rs. 2000.00
CURRICULA
&
COURSE OUTLINES
OF
MS./ M.PHIL. & PH.D PROGRAMS
FACULTY OF ARTS
The Faculty of Arts was the first Faculty established in the University in 1951. It then comprised all disciplines including Commerce, Education, Islamic Studies, Humanities, Law and Social Sciences which were later on raised to independent Faculty status.

The present faculty comprises Institutes of Languages (Arabic & Persian), Art & Design, English Languages & Literature and departments of Philosophy, Sindhi and Urdu.

The MS/M.Phil & Ph.D programs are presently offered in to Arabic, Sindhi & Urdu only, due to faculty limitation.

The Faculty has been publishing research journal “International Research Journal of Arts” (IRJA) that has been approved by the HEC Pakistan

PROF. DR. SYED JAWED IQBAL
Dean
M.A. 1987, M.Phil 1995, Ph.D 2002 (SU)
The Institute of English Language & Literature was established in 1953 as Department of English. It has produced a good number of scholars, intellectuals, teachers, journalists, officers and personnel of higher caliber, who served and are serving at the Federal and Provincial level in Pakistan and abroad also. The Department, since its inception, has produced 4 Ph.Ds. The Institute has admitted first batch of 20 M.Phil. students for two semester coursework. The Institute also offers M.A. English program in the evening.

The Institute has introduced 4-year. Bachelor (Hons.) English program as of 2009 session, replacing 3-year. Hons. program. The syllabi revised as per HEC Curriculum Committee proposal, have been recommended for adoption by the Board of Faculty of Arts and await assent of other statutory bodies. In addition the Institute has started Masters in Linguistics from the year 2009.

The faculty comprises:-
SANGI MUHAMMAD KHAN, Asstt. Professor & Incharge Chairman
MEMON RAFIQUE AHMED, Professor (on lien)
BURIRO GHULAM ALI, Asstt. Professor (Deputed at V.C Office)
M.A. (SU) 1995, Diploma in Civics Education (USA) 2005, M.Phil (Linguistics) 2013

15 Assistant Professors and 10 Lecturers

M.Phil. in Applied Linguistics: 4-Semester Program (40)
Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.
Coursework requirement:

1st Semester
- ENGL 700 Advanced Research Methods (4)
- ENGL 701 Critical Discourse Analysis (4)
- ENGL 702 Second Language Learning Theories (4)
- ENGL 703 Issues in Applied Linguistics (4)

2nd Semester
- ENGL 704 Research Methods in Language Teaching (4)
- ENGL 705 English Language Teaching Methodology (4)

3rd and 4th Semester

M.Phil. in Literature: 4-Semester Program (40)
Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.
Coursework requirement:

1st Semester
- ENGL 700 Research Methodology (4)
- ENGL 701 Literary Criticism Through Ages(4)
- ENGL 702 Periods of English Literature (4)
- ENGL 703 Pakistani English Literature (4)

2nd Semester
- ENGL 704 Advanced Research Methodology (4)
- ENGL 705 Studies in Modern English Literature (4)
2nd to 4th Semester
FACULTY OF ARTS

The Faculty of Arts was the first Faculty established in the University in 1951. It then comprised all disciplines including Commerce, Education, Islamic Studies, Humanities, Law and Social Sciences which were later on raised to independent Faculty status.

The present faculty comprises Institutes of Languages (Arabic & Persian), Art & Design, English Languages & Literature and departments of Philosophy, Sindhi and Urdu.

The MS/M.Phil & Ph.D programs are presently offered in to Arabic, Sindhi & Urdu only, due to faculty limitation.

The Faculty has been publishing research journal “International Research Journal of Arts” (IRJA) that has been approved by the HEC Pakistan

PROF. DR. SYED JAWED IQBAL
Dean
M.A. 1987, M.Phil 1996, P.h.D 2002 (SU)
INSTITUTE OF LANGUAGES

Institute of Languages was founded in 1970, merging the departments of Arabic and Persian established in 1952. In addition to regular Bachelor, Master and M.Phil./Ph.D. degree programs in Arabic and Persian languages, the Institute also offers Diploma Certificate courses in Arabic, Persian, Sindhi, Urdu, Japanese, Chinese, Russian, German, French, Turkish. It has produced 15 Ph.Ds. and presently 37 candidates are enrolled for M.Phil/Ph.D. Over the years, the faculty of the Institute has published a large number of research articles and books in various Annual/ Bi-Annual and Quarterly Research Journals/ Magazines, etc.

The faculty comprises:-

SHAIKH HAFIZ ABDUL GHANI, Professor & Director

CHANNA HAFIZ SHABIR AHMED, Asstt. Prof.
M.A., 1984, Ph.D.1993 (S.U)

SODHAR HAFIZ ZAIN-UL-ABDIN, Asstt. Prof.
M.A., 1986, Ph.D.2005

PITTAFI M. SAHIBBAD, Lecturer
M.Phil, 2011

01 Lecturer and 03 Research Associates

M.Phil. in Arabic: 4-Semester Program (40)

Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.

Coursework requirement:

1st Semester
AR 800 Research and Research Methods (4)
AR 801 History of Pre-Islamic and Islamic Arabic Literature (from 5th Century to 661 A.D) (4)
AR 802 History of Arabic Prose (from 661 A.D to 1798 A.D) (4)
AR 803 History of Arabic Poetry (from 661 A.D to 1798 A.D) (4)

2nd Semester
AR 804 History of Modern Arabic Literature (from 1798 A.D to 2002 A.D) (4)
AR 805 Arabic Language in Pakistan (from 644 A.D to 2002 A.D) (4)

2nd to 4th Semester

AR 800 RESEARCH AND RESEARCH METHODS

The purpose of this course is to familiarize students with modern techniques of research and writing Research Paper / Dissertation. It acquaints students with the meaning-purpose and scope of the Research, various research methods, art of research paper writing, besides writing of Quotations-Footnotes and reference/bibliography.

AR 801 HISTORY OF PRE-ISLAMIC AND ISLAMIC ARABIC LITERATURE (FROM 5TH CENTURY TO 661 A.D)

This course is designed to impart knowledge about the services rendered by the classical prose and poetry writers of Arabic Language and Literature in Pre-Islamic and Islamic Period. Pre – Islamic Arab Prose-Allyyadi-Al-Zubaidi Poetry-Seven Hanging Poetries-Islamic Literature: Quran, Hadith-Literature produced by Khulafa-e-Rashden their Khutabat, Qaseeda Banat Suuad.

AR 802 HISTORY OF ARABIC PROSE
The Course aims to familiarize students with the Arabic Prose produced in Umayyads, Abbasids (750 A.D to 1258 A.D), Spanish (710 A.D to 1492 A.D) and Turkish Periods (1258 A.D to 1798 A.D).

AR 803  HISTORY OF ARABIC POETRY  
(FROM 661 A.D TO 1798 A.D)
To familiarize students with the Arabic Poetry produced in Umayyads (661 A.D to 750 A.D), Abbasids (750 A.D to 1258 A.D), Spanish (710 A.D to 1492) and Turkish (1258 A.D to 1798 A.D) periods.

AR 804  HISTORY OF MODERN ARABIC LITERATURE (FROM 1798 A.D TO 2002 A.D)
The purpose of this course is to familiarize students with the History of Modern Arabic Literature and to acquaint them with the works of Modern Arabic Prose & Poetry writers, besides Prose & Poetry produced during: Mughal Period (1525 to 1857 A.D), British Period (1857 to 1947 A.D), and Independence of Pakistan.

AR 805  ARABIC LANGUAGE IN PAKISTAN (FROM 644 A.D TO 2002 A.D)
The purpose of this course is to acquaint students with the knowledge of history of the Arabic Language & Script in Pakistan. Arab Period (644/712 A.D to 1025 A.D), Ghaznavi Period (998 A.D to 1186 A.D), Salateen Period (1186 A.D to 1525 A.D), Mughal Period (1525 A.D to 1857 A.D), British Period (1857 A.D to 1947 A.D), After Independence of Pakistan (1947 A.D to 2002 A.D)

Curricula for Ph.D under preparation

DEPARTMENT OF SINDHI
The Department of Sindhi was established in the tenure of Vice Chancellor Allama I.I Kazi, at the Old Campus Hyderabad, in 1952.

Dr. N.A. Baloch became first Incharge Head of the Department. In 1971 Department was shifted to Allama I.I. Kazi Campus, Jamshoro.

This department offers BS 4-yr, M.Phil & Ph.D programs to attain Mastery in Ideology and Ethics of life. This department has a bright history in education and research; it has produced some scholars of world repute. 50 Ph.D and 8 M.Phil studies have been produced. The department has been publishing research journals with different names in different periods such as Sookhri, Saughat, Poorab, Parkh and Keenjher, the last one being published since 1987. These journals carry significant importance in the field of Sindhi Language and Literary research. The department has established Shah Abdul Latif Research Cell, in order to carried-out research on the poetry of Shah Abdul Latif for exploring the Universal values of human life to benefit the society. Extension lectures are also a part of the academic activities of the Department. Lectures from prominent literary scholars are arranged under the title of Professor Muharram Khan Lecturer Series, in order to promote literary research and disseminate the classical massage of life to the society.

The faculty comprises:

HAKRO, MUHAMMAD ANWAR, Assoc.. Professor & Chairman  
M.A. (S.U), Ph.D. (SALU) 1996

KHUWAJA NOOR AFROZ, Professor & DEAN  
M.A 1976, Ph.D 1997(S.U)

BUGHIO, MUHAMMAD QASIM, Professor  

JUNEJO, ABDUL AHAD, Asstt.Professor  
M.A. (SALU)1993

MIRBAHAR, MUHAMMAD ISHAQ, Asstt. Professor  
M.A. (S.U) 1998

02 Assistant Professor and 03 Lecturer
The Faculty of Commerce and Business Administration was established in 1989, with Late Professor Yaqoob Ansari as its first Dean. The Faculty comprises Institute of Commerce that had been functioning as department under the then Faculty of Arts since 1963, (raised to the status of the Institute in 2000) and the Institute of Business Administration functioning since 1979. The present Faculty comprises Institute of Commerce and Institute of Business Administrations.

Dean

PROF. DR. NOOR MUHAMMAD JAMALI

INSTITUTE OF COMMERCE

Department of Commerce established in the year 1963 at Old Campus, Hyderabad, was shifted to Allama I.I. Kazi Campus in 1970. It has been functioning in its new premises close to the Institute of Business Administration (IBA) of the University, since 1999 and has been recently upgraded as Institute of Commerce.

The Institute introduced 4 years B-Com (Hons.) as of 2007 session. The 4-yr program 8-semester is 136 CH, covering 45 courses. The candidate after successful completion of the course will be eligible for job in BPS 17 in Public/Private Organizations as per Federal Government Notification. Two-year M.Com. (Pass) program with specialization in Marketing, Accounting and Finance is to continue.

The objective of the 4-year degree program is to train graduates who may compete with graduates from any other institution globally:

At the end of the program the students will be able to:-

- Evaluate different financial proposal by exhibiting strong theoretical knowledge and quantitative techniques.
- Establish an accounting system for a new concern or handle the accounts of any ongoing concern.
- Have a broader understanding of corporate, legal and business affairs.
- Understand the modern business scenario.
- Provide strong managerial, interpersonal and negotiation skills.
- Conduct research independently.
- Comprehend business and economic environment.

This Institute has been imparting quality education. Courses have been designed to equip students with professional skills and knowledge to take their place as leaders in the world of Business, Commerce or any other profession they may choose to pursue. The faculty of the Institute has to their credit good number of publications in the Research Journals of national repute. The curriculum as noted above is relevant to the changing needs of society.

The Institute has well-equipped Computer Laboratory with latest software to provide training to the students. It has an excellent Seminar Library with 6500 text and reference books on Management, Marketing, Accounting, Finance, Economics and others. The Institute also offer 2-yr M.Phil program in Commerce.

The faculty comprises:-

JAMALI, NOOR MUHAMMAD, Professor & Dean
M.Com (SU) 1983, Ph.D (HIMS) 2006

SOOMRO MUNEERUDDIN, Professor & Director

SHAIKH KHALID HUSSAIN, Professor
M.Com. (S.U) 1981, Ph.D. (KU) 2004

KANASRO HAKIM ALI, Professor
M.Com. 1983 (S.U), Ph.D. (SALU) 2008

CHANDIO JAWED AHMED, Asstt: Professor
M.Com. (S.U) 1991, Ph.D (KU)
HALEPOTO JAMSHED ADIL, Asstt: Professor

JHATIYAL ASHIQUE ALI, Asstt. Professor

08 Assistant Professor 02 Lecturer & 02 Teaching Assistants

M.Phil in Commerce: 2 years program (40)
Pre-requisite: Master / 4 Years Graduation in relevant field; Pre-Admission Test.

1st Semester

COM 801 Philosophy of Social Sciences (4)
COM 802 Advanced Research Methodology (4)
COM 803 Inferential Statistics (4)
COM 804 Computer Techniques in Business (4)

2nd Semester

COM 805 Issues in Contemporary Business (4)
COM 806 Corporate Governance (4)
COM 807 Comprehensive Viva-Voce

3rd to 4th Semester

COM 895 Research on approved topic, Dissertation & its defence (16)

COM 801 Philosophy of Social Sciences
This course aims to help researcher/student to develop a philosophical understanding of the social sciences and their problems. The first part of the course focuses exclusively on the philosophy of science, and the second on the philosophy of the social sciences.

Background of philosophy of social science, Structure and Action, Ontology-a Methodology- an Epistemology, Understanding vs Explanation, Determinism A Rationalist way of discovering the truth Appearance vs. Reality Positive Science: The Empiricist way, Positivism, A gradual and unbroken ascent, Hume and Causation, Positive Economics.

COM 802 Advanced Research Methodology

COM 803 Inferential Statistics

COM 804 Computer Techniques in Business
Introduction, Data Communication & Networks, Data Processing, Internet, Microsoft Office, Statistical Package for Social Sciences.

COM 805 Issues in Contemporary Business

COM 806 Corporate Governance
Corporate Governance, Strategic decisions, Characteristics, Strategic Corporate Management, Strategic analysis, Choices & Implementation, Explaining Strategic Management Process, Corporate Governance in Different Contexts,

Ph.D in Commerce: Curricula under preparation

INSTITUTE OF BUSINESS ADMINISTRATION

The Institute of Business Administration, University of Sindh, formerly Institute of Business Studies (IBS), was established in 1979 under the dynamic leadership of Late Professor Nabi Bakhsh Daudpota. Initially housed in the Allama I.I. Kazi Library Building of the University, it was later shifted to its present premises in 1984 and redesignated from IBS to Institute of Business Administration in 1999.

The total number of students in morning and evening programs in various classes is close to 1890. The IBA has thoroughly updated its curricula under the revised scheme of studies; new grading system has also been introduced from the year 1999-2000, to bring the grading at par with the leading Business Schools of the country.

The Institute offers 4-year Bachelor Degree- BBA (Hons.) program from 2007 onward with specialization in Finance, Marketing, Information Technology and Human Resource Management. The IBA also offers MBA direct degree (2-year 4 Semester Master's program) in its regular morning program with specialization in Finance, Marketing, Management Information System, Human Resource Management and Accounting.

I.B.A. also offers 18 months MBA(F) Hons. after 4 years BBA(H) program w.e.f 2011 and 4 semester M.Phil program effective 2011 session.

I.B.A. also offers Two years six semester MBA evening program specially designed for in-service personnel and for those who desire to seek better job opportunities.

The faculty comprises:

KHOSO IMAMUDDIN, Associate Professor & Director,
M.B.A (S.U) Ph.D (Japan) 2008, Post Doctorate (Canada) 2011

SYED ANWAR ALI SHAH G. SYED, Professor,

CHANNA NIZAMUDDIN, Associate Professor,

MEMON MUHAMMAD, Assistant Professor
M.B.A (S.U) 1993, M.Phil (IQRA) 2013

QURESHI SAIMA, Assistant Professor

KARIM BUX SHAH, Assistant Professor
M.B.A (S.U) M. Phil (IQRA) 2012

13 Assistant Professors & 05 Lecturers

M.Phil in Business Administration 4 Semester program (40)
Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.

1st Semester

801 Strategic Management
802 Advanced Research Methodology
803 Decision Theory & Analysis
804 Computer Applications in Research

2nd Semester

805 Elective-I
806 Elective-II

3rd to 4th Semester

895 M.Phil Thesis: Evaluation & Viva-Voce 16-CH
Note: Details of courses available with the Director

Ph.D in Business Administration program; 18CH Coursework under preparation
FACULTY OF EDUCATION
The Faculty of Education, University of Sindh, is committed to the highest standards of research and teaching and has been a significant contributor to the improvement of educational policy and practice in partnership with schools, colleges and other educational agencies.

The Faculty has excellent facilities to support teaching and research. The Faculty has a library with one of the best collections in Sindh, besides computer and internet facilities. All teaching faculty members are active researchers. A flexible approach to research groupings is adopted with colleagues working together, as individual interests and projects dictate.

Objectives of the M. Phil. in Education Program:
The M. Phil. degree in Education is specifically for professional practitioners in education, including those in public or private schools, community or government agencies, professional associations, and other education-related settings. This program includes study and practice of educational research and its application. The program includes intensive core coursework that introduce first semester students to the breadth of educational topics and inquiry, and to quantitative qualitative, and epistemological approaches to educational research.

This program is individualized, interdisciplinary, and experiential. Students, with the guidance of faculty advisers, plan their study as success in the program requires a high degree of personal initiative, self-directed learning, and commitment to inquiry.

Areas of Expertise and Research
As part of the M. Phil program students carry out a research project. The work of each student is supervised by a faculty member having expertise in the relevant field.

The present faculty have expertise relating to:
- The theory, policy and practice of education and schooling, and of teaching and learning;
- The processes of teaching and teacher development;
- Curriculum and pedagogy in most subjects of the school curriculum and in literacy;
- Educational Leadership and School Improvement
- Management, Economics and Education

PROF. DR. PARVEEN MUNSHI
Dean of the Faculty

The faculty comprising each department is listed hereunder:-

Department of Science and Technical Education
JAFRI SYED IFTIKHAR HUSSAIN, Asstt. Professor & Incharge Chairman
01- Asstt. Professor & 03 Lecturer

Department of Curriculum Development & Special Education
KHAN SALEHA PARVEEN, Assoc. Professor & Chairperson
03 Assistant Professors & 2- Lecturers

Department of Educational Management & Supervision
ALMANI ABDUL SATTAR, Assoc. Professor & Chairman
SIDDQUI ABIDA, Asstt. Professor
M.Ed. 1996, M.A (Urdu) 1998 (SU) Ph.D (SU)
PANHWAR UZMA, Asstt. Professor
M.A. (Sindhi), M.Ed. (S.U.), M.Phil. 2007 (HU)
01 Assistant Professor

Department of Psychological Testing, Guidance & Research
PARVEEN MUNSHI
MUGHAL FARZANA, Asstt. Professor, Incharge Chairperson
04- Lecturers

Department of Distance, Continuing and Computer Education
MUNSHI PARVEEN, Professor & Incharge Chairperson
Department of Education

KHUWAJA MUMTAZ, Asstt. Professor & Incharge Chairperson
M.Sc. Zoology (SU) & M.Ed. (KU)
01 Lecturer

M.Phil in Education 4-Semester Program (40):
Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.

1st Semester

<table>
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<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>ED 800</td>
<td>Research Methods – I</td>
<td>4</td>
</tr>
<tr>
<td>ED 801</td>
<td>Research Methods- II</td>
<td>4</td>
</tr>
<tr>
<td>ED 802</td>
<td>Psychological Perspective &amp; Issues in Education</td>
<td>4</td>
</tr>
<tr>
<td>ED 803</td>
<td>Issues in Curriculum</td>
<td>4</td>
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2nd Semester

<table>
<thead>
<tr>
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<th>Course Name</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ED 804</td>
<td>Education in Pakistan: Trends &amp; Issues</td>
<td>4</td>
</tr>
<tr>
<td>ED 805</td>
<td>Educational Management &amp; Leadership</td>
<td>4</td>
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</table>

2nd to 4th Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ED 895</td>
<td>Research on approved topic, Thesis/ Dissertation and Defense</td>
<td>16</td>
</tr>
</tbody>
</table>

All students are to complete the coursework with GPA 3.00 or above to move in the 2nd year of the program.

ED 800 RESEARCH METHODS - I
This course provides an introduction to research design and methods in Education. Topics include Research Problem and Hypothesis; methods and tools of research; various research designs such as experimental, quasi-experimental, and historical research, qualitative and action research. Class research exercises are incorporated to illustrate designs and to provide experience in carrying out research.

ED 801 RESEARCH METHODS – II
This course focuses on quantitative approaches to educational research, and gives students hands-on experience of using computer packages for data management, statistical analysis and presentation. It includes how to write a comprehensive research proposal, research report and critically analyze these, besides writing thesis, as per standard format.

ED 802 PSYCHOLOGICAL PERSPECTIVE & ISSUES IN EDUCATION
This course is designed to provide students in Education with a working knowledge of important concepts and issues in Educational Psychology. Topics to be addressed include child development, cognition, learning and instruction, individual variations, exceptionalities, classroom motivation and assessing students. This course will focus on information related to the practice of teaching.

ED 803 ISSUES IN CURRICULUM
This course provides an in-depth study of Issues in Curriculum. Topics include curriculum concepts and theories, curriculum policy making, design and organization and organization of curriculum, implementation and evaluation of curriculum, and curriculum development in Pakistan.

ED 804 EDUCATION IN PAKISTAN: TRENDS & ISSUES
The course aims at imparting an advanced and intensive study of the development of education in its historical perspective with emphasis on various educational policies and plans formulated after independence: significant trends, issues, problems and challenges to the system from primary to tertiary level in the light of global perspective; resources constraints, resource mobilization, population growth, environmental hazards, drugs, and gullet culture.

ED 805 EDUCATIONAL MANAGEMENT AND LEADERSHIP
The course is designed to meet the specific needs of the educational managers, leaders, supervisors in Pakistan and other pursuing post-graduate studies at Ph.D level in Education. The topic included in this course are Academic Management, Managing People, finance, monitoring and Evaluation.

**Ph.D in Education: 6 Semester Program: 18 CH Course work curricula under preparation.**

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.
FACULTY OF ISLAMIC STUDIES

The Faculty of Islamic Studies was established in June, 1994. It comprises the following 2 departments, i.e., Department of Muslim History and Department of Comparative Religion & Islamic Culture, functioning since 1952-53 under the Faculty of Arts.

PROF. DR. MUHAMMAD ANWAR KHAN PATHAN
Dean,

DEPARTMENT OF COMPARATIVE RELIGION & ISLAMIC CULTURE

The Department of Comparative Religion and Islamic Culture is the second oldest teaching department of the University, established in 1952-53. The department takes pride in having produced maximum number of Ph.Ds (143) awarded by the University.

The scheme of studies for M.Phil in Islamic Culture with different specializations has been revised and approved by the competent authorities.

The faculty comprises:-
HAFIZ MUNIR AHMED, Assoc., Professor & Chairman
KHAN MUHAMMAD ANWAR, Professor & Dean
BHUTTO SANAULLAH, Professor
RIND BASHIR AHMED, Asstt. Professor

02 Assistant Professor & 02 Lecturers

M.Phil. in Islamic Culture 4- Semester Program (40)
Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.

That program comprise 6 (Six) courses of 24 CH during 1st and 2nd semester and research thesis of 16 CH as outlined hereunder:

1st Semester

IC 800 Methodologies and Modes Research (4)
IC 801 Tafseer and Uloom-ul-Quran (4)
IC 802 Hadith (4)
IC 803 Fiqh (Islamic Law and Jurisprudence) (4)

2nd Semester

IC 804 Comparative Religion
IC 805 Contemporary Issues of Islamic World (4)

2nd 4th Semester


IC 800 METHODOLOGIES AND MODES OF RESEARCH

IC 801 TAFSEEER AND ULOOM AL-QUR’AN
Introduction to Qur’anic Exegesis and Sciences of the Qur’an; Methodologies and Mode of Tafseer, as the Sources of Uloom al-Quran. Types of Tafseer, Israeli Literature in Tafseer: A general review. Omission of Isnad, Studies in some important books of Tafseer bil-Mathur; Tafseer bil-Ray: Important works of Tafseer bil-Ray: works of disapproval of Tafseer bil-Ray, causes and motives: Tafseer according to some well known sects: Mutazila’s, Shii Tafseer, Kharjites’, Principles and Methodologies of legal Tafseer, some important works of legal Tafseer: Ibn al-Arabi: Ahkam al-Quran, Jassas: Ahkam al-Quran, Qurtubi: Al-Jami Li-Ahkam al-Quran, Imam Shafii: Ahkam al-Quran, Tabari: Ahkam al-Quran. Linguistic and Literary Tafseer, Some important linguistic commentaries. Studies of Tafseer work on the meaning and Syntactical marks of the Quran. Important works on Qi’rat, Subjective Commentaries of the Quran, Sciences of the Qur’an:

IC 802 HADITH
Basic sources of Hadith and ‘Ulim al-Hadith, Evolutionary stages of the Prophetic Sunnah: Sunnah during the Prophetic Age, The age of Companions, junior Companions and the followers, Compilation of Hadith in the Second Century Hijrah, Abbaside Caliphs attitude towards Hadith, Development of Hadith from 4th Century till Modern-Age:

IC 803 FIQH (Islamic Law and Jurisprudence)
Sources of Research in Islamic Law, Principles and methodologies of Islamic Jurisprudence. Science of Fiqh and Usul al-Fiqh, objectives of Shari’ah. Historical development of Fiqh and Usul. Important works of Usul al-Fiqh. The status of Ijtihad and Taqlid in Islamic Fiqh. Ijtihad; Legal status and requisites. Reason and Ijtihad in Fiqh, Taqlid, requisites of Ijma, Qiyas. Selected topics from commentaries written from legal perspective. The legitimacy of Jihad in Islam and its legal rules. The legality of divorce and its legal rules - the legal detail of maturity (adulthood), Primary Sources of Fiqh:

IC 804 COMPARATIVE RELIGION
Definition of Religion, Religions of World, Hinduism, Buddhism, Confucianism, Zorastanism, Judaism, Christianity, Sikhism, Qadianiat and other Non-Islamic Religions, Islam.

IC 805 THE CONTEMPORARY ISSUES OF ISLAMIC WORLD
Geo-Political position of Muslim World with reference to Muslim countries: Saudi Arabia, Turkey, Egypt, Iraq, Indonesia, Iran, Libya, Arab Emirates, Central Asian Muslim States. Study of the above countries with special reference to Pakistan. Pakistan as a Islamic State, its foreign policy, Survey of Pan-Islamic Movements, Contemporary Issues for the Muslim Ummah. Study of outstanding Muslim Scholars. Survey of Muslim Minorities in East and West, Need for coordinating their problems.

Ph.D in Islamic Culture: 6 Semester Program: 18 CH Course work Courses under preparation.
Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.
FACULTY OF NATURAL SCIENCE

The Faculty of Natural Sciences is one of the two oldest Faculties, established in 1953, starting with Chemistry, Mathematics and Physics departments with addition of Botany (1954), Zoology and Geography (1955) and Geology in 1956. The Faculty has expanded further over the years and now comprises two Centres, seven Institutes and seven teaching departments with Anthropology & Archeology being the latest additions. It is the largest Faculty of the University, with 60% of the total students enrolment. Most of the departments/ Institutes and their faculty have been actively involved in research. “Sindh University Science Research Journal” is a regular publication of the Faculty, being published since 1965, with contributions from the faculty members. The HEC has placed it in “Y” Category.

The Faculty also enjoys the distinction of being the first among Public Sector Universities of the country to introduce 4-yr Bachelor degree (BS) program for all the disciplines; The 4-yr study will provide thorough grounding in the major disciplines along with broad-based knowledge in relevant fields, e.g., General Maths courses for Biology students or vice versa, etc.

BS 4-yr. degree entitles students to join MS (M.Phil) program being offered in various disciplines where faculty with Ph.D qualification is available.

ABBASI ABDUL RASOOL
DEAN

CENTRE FOR PHYSICAL EDUCATION, HEALTH
& SPORT SCIENCE

Two Year MS/M. Phil Degree Program in Physical Education & Sports Science is designed with the objective to provide necessary theoretical and practical research skills in Physical Education, Health & Sports Science.

The MS/M.Phil program is of two years (four semester duration, comprising mainly course work. During the first semester the candidate has to select 04 courses total 16 CH and has to secure a minimum score of CGPA-2 for promotion in 2nd Semester. In second semester two courses 8-CH (04 CH each course) and has to secure CGPA-3. On the success full completion of the Course work the candidate will select the topic for research and present it for
approval to the Supervisor and scrutiny committee. After having Approval of Research Topic from Supervisor and scrutiny committee, it will refer to Board of Advance Study & Research (BASR) for Final approval. Then the candidate will carry out his / her Field / Lab research work during 3rd & 4th Semesters and produce his / her work for defense in shape of two seminars in front of the learned council of Professors. On Successful completion of Seminar the written work will be submitted further for Plagiarism and Evaluation. Final Evaluation will be made in shape of Viva Voce in front of panel of Experts. On successful evaluation of thesis and Viva-Voce examination the candidate will be awarded the degree.

The faculty comprises:-

MUGHAL MEHMOOD-UL-HASSAN, (MD) Asstt Prof. & Incharge Director
M.B.B.S, M. Phil 2009 (S.U)

QURESHI YASMEEN IQBAL, Professor
M.A., M. H. P. Ed, Ph.D. (SU) 2004

SYED AKHTAR ADIL SHAH, (MD) Asstt. Professor
B-Pharmacy, M.B.B.S.

GHORI, SONIHA ASLAM, (MD) Asstt. Prof.
M.B.B.S, (SU)

04 Assistant Professors, 01 Lecturer & 01 Demonstrator

**M.Phil. in Physical Education: 4- Semester Program (40)**

Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.

**1st Semester (Compulsory Courses)**

PESS-800 Research Methods & Computer Applications (4)
PESS-802 Administration, Planning & Management (4)

**(Optional Courses)**

Two courses to be offered amongst th following:

PESS-804 Medicine and Sports Science (4)
PESS-806 Environmental Science (4)
PESS-808 Studies ofHealth Education (4)

**2nd Semester**
Two courses to be offered amongst the following:

PESS-810 Sports Psychology (4)
PESS-812 Specialization in selected sports outdoor / indoor (4)
PESS-814 Specialization in selected Athletics (Track & Field events) (4)
PESS-816 Specialization in selected Gymnastic (Apparatus / Floor work) (4)

Note: The course as listed under optional will be offered, subject to the availability of qualified staff and facilities.

2nd to 4th Semester:


CENTRE FOR PURE & APPLIED GEOLOGY

The present Centre for Pure and Applied Geology had its beginning as Department of Geology established in 1956 at Elsa Kazi Campus, Hyderabad. That was moved to Allama I.I. Kazi Campus, in June 1961, where it was temporarily lodged in the Chemistry Block. In 1971, it was moved to its present premises which has since then been expanded; a new block along with an Auditorium was added in 1992. Four new advanced Research Laboratories with state of the art equipment like XRF, XRD, SEM and Atomic Absorption were established in 2007.

The Department (now Centre for Pure & Applied Geology) has produced a monograph on “Geology of Sindh” in addition to works pertaining to the various regions of Pakistan. It has completed a number of research projects e.g. “China Clay (Nagarparkar)” financed by PSF, “Clay Deposits of Sindh”, “Glass Sand resources of Sindh” and “Resistivity Survey for Ground water in Kohistan Area, district Dadu” sponsored by UNICEF. Recently, hydrogeological studies on two research projects funded by the HEC and PSF have been completed. One research project “Paleoenvironmental study of Lower Goru Formation in the subsurface of Lower Indus Basin, Pakistan”, sponsored and funded by PSF, is in progress. Besides, the Centre has recently contracted projects on a feasibility study of granite deposit of District Tharparkar Sindh and Dimension Stone in Dadu, Jamshoro and Thatta. One research project on “Detection of saline intrusions in the right bank sediment of southern Sindh”, sponsored by PSF and “Investigation of Seawater intrusions-left bank sediment of southern Sindh”, sponsored by NDP have been completed in 2006. Presently centre is also working on a collaborative research project Geology and geomorphological studies of the Nagarparkar, District Tharparkar Sindh, sponsored by Pakistan Academy of Sciences.
The Centre has been offering revised M.Phil/ Ph.D programmes in Geology and Petroleum Geology since 2003 session. Presently, twenty three students are working for their M.Phil/ Ph.D studies. Earlier, two candidates earned their Ph.D. degrees and three M.Phil studies were completed during the 1980s. besides M.Phil, Ph.D in Geology the Centre also offers M.Phil in Geology & Petroleum Geosciences as spring semester 2014.

A Coal Research Lab has been established with the Collaboration of weatherford Oil Tools. M.E Ltd. And a Geophysics chair with the collaboration of PPL is supposed to be established in this year.

The faculty comprises:-

SOLANGI SARFRAZ HUSSAIN, Professor & Director

USMANI PARVEEN AKHTAR, Visiting Professor
M.Sc.1972, M.Phil. 1981, Ph.D. 1985 (S.U)

BROHI IMDAD ALI, Professor

BABLANI SAEED AHMED, Assistant Professor
M.Sc (QAU) and MS (Norway)

SIDDIQUI IMDADULLAH, Associate Professor

AGHEEM MUHAMMAD HASSAN, Associate Professor

LAGHARI AMANULLAH, Associate Professor
M.Sc. (SU) 1988, Ph.D. (Peshawar) 2006

LASHARI RAFIQUE AHMED, Assistant Professor

07 Lecturers
M.S/M.Phil. Program in Petroleum Geosciences (40)

Pre-requisite: Master / 4 Years Graduation in relevant field; Pre-Admission Test.

1st semester

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOL 801</td>
<td>Research Methodology &amp; Report writing</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 802</td>
<td>Geoinformatics</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 803</td>
<td>Sedimentology of Petroleum Systems</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 804</td>
<td>Regional Petroleum Geology</td>
<td>4</td>
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2nd semester

<table>
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<tr>
<td>GEOL 805</td>
<td>Optional Paper I</td>
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</tr>
<tr>
<td>GEOL 806</td>
<td>Optional Paper II</td>
<td>4</td>
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</table>

List of Optional Courses

01. Prospects Evaluation & Petroleum Economics (4)
02. Petroleum Engineering (4)
03. Petroleum Geochemistry (4)
04. Carbonate Sedimentology (4)
05. Basin Analysis (4)
06. Reservoir Geology and Geophysics (4)
07. Advanced Well Logging (4)
08. Biostratigraphy (4)
09. Petroleum Structural Geology (4)

3rd & 4th Semester

<table>
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<th>Course Code</th>
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<tr>
<td>GEOL 807</td>
<td>Assignment and Lab work (Research Topic)</td>
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<tr>
<td>GEOL 808</td>
<td>Thesis</td>
<td>12</td>
</tr>
</tbody>
</table>

Lab work and Thesis

Research projects may be based on analytical desk studies, fieldwork, or a combination of any of these. When appropriate and possible, projects will be matched to previous work experience and may involve collaboration with organizations outside the University. Individual project supervisors will advise on project selection, planning and development. The purpose of the research project is to provide students with an opportunity to apply, in a realistic exercise, knowledge and skills learned in the taught component. Students will be expected to demonstrate a
command of appropriate research methods through application to a specific topic area. They will be expected to review and interpret previous relevant work, and present coherent arguments of relevance to their project.

M.S/M.Phil. Program in Petroleum Geosciences starting from 2014

Compulsory courses (First semester)

GEOL 801 Research Methodology & Report writing

Selection of research topic. Literature review on the selected topic. Related topics of data collection and laboratory analysis. Concepts of Computer languages and programming. Geosciences softwares, word processing and statistical packages. Seminar/oral presentation on the assigned topic and work plan.

GEOL 802 Geoinformatics


GEOL 803 Sedimentology of Petroleum Systems

Introduction to the sediments that form a typical hydrocarbon play (reservoir, source, seal) in clastic and carbonate successions. Discussion about the fundamental sedimentological processes and controls that govern the spatial and temporal variability of reservoir, source, and seal. Porosity and permeability and its relationship to reservoir quality. How these vary spatially and with burial, due to depositional facies variability and diagenetic processes.

GEOL 804 Regional Petroleum Geology

Introduction to Petroleum geology. Geologic and Geographic occurrences and economics of Unconventional oil and gas resources like very viscous oil and gas from low-permeability rocks, coal bed, and hydrates. Petroleum systems overview. Regional petroleum Exploration History and major discoveries. Case studies of significant discoveries of Pakistan, Middle East, Asia, Europe and America. Current and future global exploration strategies.

Optional Courses

1. Prospect Evaluation and Petroleum Economics

Exploration geologists' role in identifying and developing a play and producing leads and prospects. Petroleum system analysis, and play fairway definition. Mapping techniques and an understanding of the data required to evaluate a lead / prospect. Play fairway analysis. Reserves estimation. Concept of Chance of Success and the quantification of risk. Basic concepts and background for the financial and economic assessment of projects within the petroleum industry. Case studies of a number of Petroleum Provinces and selected fields.
2. Petroleum Engineering

3. Petroleum Geochemistry
Petroleum geochemistry fundamentals with strong emphasis on applications to petroleum exploration and production. geochemical methods and markers. Source rock quality, maturity, and potential, Migration efficiency and direction, Maturation and degradation, Correlation: oil-to-oil, oil-to-source rock, gases. Temperature, time and quantitative modeling of maturity for systems with unconformities, changing gradients, and faulting. Worldwide exploration and production case studies.

4. Carbonate Sedimentology
Introduction, Classification of Carbonate Rocks According to Depositional Texture, Evolution from Sediment to Rock: Carbonate Sedimentation and Diagenesis, Carbonate Pore Classification, Environmental Controls, Depositional Environments, Modern and ancient examples of various important depositional environments. Facies and Depositional Systems of Carbonates, Sedimentary Facies Patterns, Depositional Models and Nomenclature, Carbonate Stratigraphy of Platform.

5. Basin Analysis
Basins in their plate-tectonic setting. Lithosphere behavior and the mechanisms of basin formation. Types of extensional, compressional and strike-slip basins. Facies architecture of basins including: (i) tectonics and sedimentation (ii) sequence stratigraphy. The interaction between sea-level change, tectonics, climate and sediment supply in the final development of a basin-fill. Basin analysis: (i) thermal history, fluid generation and migration (ii) compaction history (iii) back stripping and forward and inverse modeling. Case studies including examples from Pakistan and Middle East.

6. Reservoir Geology and Geophysics
Pore pressure, Causes of normal, high and low pore pressures, Overburden pressure or overburden stress. Porosity and permeability, Fluid saturations, Water and oil contacts, Gas and oil contacts, Reservoir zonation and thickness mapping, reservoir pore spaces configuration, mapping reservoir heterogeneity. Reservoir estimation and calculation of reservoir-volumetric, material balance and production decline curve methods. Appraisal and development of reservoir, basic concepts. Changes in reservoir parameters due to production.

Petrophysics, Formation Evaluation – physical properties and wireline logs properties, core analysis, Image Logs and determination of lithology and porosity, acoustic Impedance inversion, Fracture Analysis and seismic anisotropy

7. Advanced Well Logging
Modern formation evaluation techniques using wireline logs, Mud logs, core data, geological information, 3D seismic data, and physics of fluid-flow in porous media. Description of the static and dynamic behavior of hydrocarbon
reservoirs. Several single- and multi-well data sets will be used to illustrate the technical concepts and significance of log data.

8. Biostratigraphy


9. Petroleum Structural Geology


MS/M.Phil. in Geology 4- Semester Program (40)

Pre-requisite: BS/M.Sc, Pre-Entry Test

Two semester course work M.S./M.Phil. program (24 credit hours course work) + (16 credit hours for thesis and Defence).

During first semester of teaching in M.S/M.Phil. (Geology) four compulsory courses will be taught and in second semester two optional courses will be taught in the relevant field of specialization from the following list of courses. Scheme was approved by the Board of Advance Studies and the Board of Faculty for two semester course.

1st Semester

GEOL. 800 Research Methodology & Report writing (4)
GEOL. 801 Advance Sedimentology (4)
GEOL. 802 Geology and Geodynamics of Pakistan (4)
GEOL. 803 Carbonate Sedimentology (4)

2nd Semester: Two courses may be offered from any one of the following field of specialization.

PETROLATUM GEOLOGY

GEOL. 805 Petroleum Exploration
GEOL. 806 Reservoir Geology
GEOL. 807  Sequenced Stratigraphy
GEOL. 808  Basin Analysis
GEOL. 809  Petroleum Geology of Pakistan
GEOL. 810  Well Logging

SEDIMENTOLOGY
GEOL.811  Applied Sedimentology
GEOL.812  Sedimentology & Stratigraphy
GEOL.813  Sequence Stratigraphy
GEOL.814  Basin Analysis

MARINE GEOLOGY
GEOL.815  Physical Oceanography
GEOL.816  Marine Geology
GEOL.817  Geology of Arabian Sea
GEOL.818  Coastal Geomorphology
GEOL.819  Deep Sea Sediments
GEOL.820  Marine Geophysics

PETROLOGY & MINERALOGY
GEOL.821  Petrogenesis
GEOL.822  Igneous Petrology
GEOL.823  Metamorphic Petrology
GEOL.824  Mineralogy
GEOL.825  Geochemistry-I
GEOL.826  Geochemistry-II

ENVIRONMENTAL GEOLOGY
GEOL.827  Geo-environment & Geological hazards
GEOL.828  Geo-Informatics
GEOL.829  Medical Geology
GEOL.830  Environmental Impact Assessment
GEOL.831  Environmental laws and standards

GEOPHYSICS
GEOL. 832  Gravity and Magnetic methods
GEOL. 833  Seismic methods and seismic stratigraphy
GEOL. 834  Radiometric and electrical methods
GEOL.835  Borehole geophysics

HYDROGEOLOGY
GEOL. 836  Applied Hydrogeology
GEOL. 837  Hydrogeophysics
GEOL.838  Water quality and groundwater contamination
GEOL.839  Groundwater development and management

MICROPALEONTOLOGY/BIOSTRATIGRAPHY
GEOL.840  Bio-stratigraphy
GEOL.841  Advanced Foraminifera
GEOL.842  Advanced Ostracodes
GEOL843  Palynology

GEOL. 800 RESEARCH METHODOLOGY
Selection of research topic. Literature review on assigned topic related technique of data collection and laboratory analysis. Concepts of Computer language & programming, Geoscience softwares, word processing and statistical packages. Seminar/ oral presentation of the plan of assigned topic.

GEOL. 801  ADVANCED SEDIMENTOLOGY
Study of specialized aspects of sedimentary processes and environments, different types of sedimentological information and interpreting sedimentary environments and facies.

GEOL. 802  BIO-STRATIGRAPHY, TECHNIQUES OF CORRELATION & GEOLOGY OF PAKISTAN
Principles of Bio-stratigraphy and techniques of correlation, concept of facies types and significance, tectonic framework of Pakistan and its relation with adjoining basins of the sub-continent. Detailed Geology of Indus basin and northern mountain regions.

GEOL. 803  CARBONATE SEDIMENTOLOGY
Ph.D in Geology: 6 Semester Program: (18 CH Course work)

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

1st Semester
Core Courses

GEOL. 901  Geoscientific writing and presentation skills (4)
GEOL. 902  Geostatistics and Geocomputing (4)
GEOL. 903  Advanced Sedimentology (4)

2nd Semester
To be selected from the list optional courses in the facing column.

GEOL. 904  Optional Paper I (3)
GEOL. 905  Optional Paper II (3)
GEOL. 995  Thesis

List of Optional Courses

01. Reservoir Geology (3)
02. Sequence Stratigraphy (3)
03. Basin Analysis (3)
04. Marine Geology (3)
05. Marine Geophysics (3)
06. Petrogenesis (3)
07. Geochemistry (3)
08. Environmental Geosciences (3)
09. GIS & Remote Sensing (3)
10. Seismic Stratigraphy (3)
11. Borehole geophysics (3)
12. Applied Hydrogeology (3)
13. Hydrogeophysics (3)
14. Advanced Foraminifera (3)
15. Advanced Ostrocodes (3)
16. Palynology (3)
17. Coal Geology (3)
18. Advanced Geophysics (3)
19. Carbonate Sedimentology (3)
20. Petroleum Structural Geology (3)
21. Regional Petroleum Geology (3)

**COMPULSORY/CORE COURSES**

**GEOL 901 Geoscientific writing and presentation skills (Cr. Hrs. 4)**

Substantial writing components. Literature review and introduction to Geoscientific Journals.


**GEOL 902 Geostatistics and Geocomputing (Cr. Hrs. 4)**

Use of computers and statistics in Geosciences. The overview and fundamentals of geostatistics. The application and understanding of statistical concepts and softwares to study Geological processes. Understanding of fundamental statistical softwares used in Geosciences. The use of statistical softwares. Graphing and data visualization and descriptive statistics. Application of GIS and Remote sensing through the use of ARCGIS, Global Mappar and other related softwares. Introduction to industry related Geological and geophysical softwares such as REFLEXW, GEOGRAPHIX, PETREL, and GEOFRAME.

**GEOL 903 Advanced Sedimentology (Cr. Hrs. 4)**

The study of specialized aspects of sedimentary processes and environments with an emphasis on integrating different types of sedimentological information an interpreting sedimentary environments and Facies.

**OPTIONAL COURSES**

**Reservoir Geology (Cr. Hrs. 3)**


**Sequence Stratigraphy (Cr. Hrs. 3)**


**Basin Analysis (Cr. Hrs. 3)**


**Marine Geology (Cr. Hrs. 3)**


**Marine Geophysics (Cr. Hrs. 3)**


**Petrogenesis (Cr. Hrs. 3)**


**Geochemistry (Cr. Hrs. 3)**
Geochemical characteristics of igneous rocks as petrogenesis indicators. Triangular variation diagrams. Geochemical characteristics of primary magmas. Fractional crystallization. Geochemical characteristics of different magma series.


Environment Geosciences (Cr. Hrs. 3)

Air Pollution, Groundwater and its contamination, Water Pollution Geology and Environmental Impact of Waste Disposal ,Global Warming: Basic Principles ,Mining and The Environment, Fossil Fuels Alternative Energy Sources. Volcanoes.: Magma sources and types, locations of volcanic activity, types of volcanoes, hazards related to volcanoes, and reducing volcanic hazards. Earthquakes: Earthquake hazards and reduction of hazards, and earthquake predictions. The mechanism of an earthquake; the most probable locations of an earthquake; seismic waves. The hazards associated with earthquakes; how to reduce those hazards; what to do before, during and after an earthquake. Mass Movements: Land sliding and its causes Coastal Hazards: Coastal Processes, El Niño and La Niña, Tsunamis

GIS and Remote Sensing. (Cr. Hrs. 3)

Fundamentals of Maps; map reading, scale, types and sources, map co-ordinate systems and projections (Cylindrical, Conic, Azimuth), Aerial Photographs stereo photographs, height determination, orthophotographs. Introduction to Remote Sensing (RS), EMR, platforms and sensors, resolution, multispectral, thermal, microwave, hyper spectral, image interpretation, classification), Global Position System; Introduction, basic concepts, functions, data collection, methods. Geographical Information System; Introduction, concepts, features, data models, spatial data & non-spatial data, integration and analysis. Applications of Remote Sensing and GIS in Geology and environmental studies. Introduction softwares ARCGIS, MAPINFO, SURFER, GOOGLE EARTH, and GLOBALMAPPER.

Seismic Stratigraphy (Cr. Hrs. 3)


Borehole geophysics (Cr. Hrs. 3)

Reservoir geometry and rock properties (Density, Porosity, permeability, saturation). Drilling fluids. Most common measurements in well logging (Electrical, radiometric, acoustic and geometric log measurements), their principles and applications. Determination of porosity, fluid/gas saturation, lithology, formation factor and clay content. MWD (Measurements While Drilling), Mud logging and Production logging. Coring. Depth and data quality control.
Corrections and log interpretation procedure. Comparison and correlation of different logs with each other. Cross plot. Estimation of reserves, permeability and productivity.

Applied Hydrogeology (Cr. Hrs. 3)


Hydrogeophysics (Cr. Hrs. 3)

Electrical resistivity method for exploration and exploitation of groundwater. 1D, 2D & 3D electrical imaging surveys. Electromagnetic method and geophysical well logging to explore the subsurface and quality of the groundwater.

Practical: Use of Terrameter and LUND imaging system in the discovery of groundwater. Use of computer software(s) in the interpretation and modeling of electrical resistivity data.

Advanced Foraminifera (Cr. Hrs. 3)

A broad survey of main foraminiferal groups. Planktonic, Benthonic and larger foraminifera. Their morphological, biological, and ecological characteristics. Its application, zonation, and correlation. Techniques of study of foraminifera.

Advanced Ostrocodes (Cr. Hrs. 3)


Palynology (Cr. Hrs. 3)

Pollen and spores morphology, development of homospores distribution of palynomorphs during various geological periods. Methods of study and techniques of preparation of palynomorphs.

Coal Geology (Cr. Hrs. 3)

Coal origin and formation. Coal constitution – organic and inorganic components, rank and condition. Geology as related to exploration, development and mining of coal; stratigraphy, sedimentation and structure of coal deposits; type of coal basins and their tectonic setting; concepts of cyclical deposition in coal basins; origin of splits and partings in coal seams; relationship of modern environments and ancient coal-forming environments; structural problems relevant to exploration and mining of coal; methods of resource evaluation.

Advanced Geophysics (Cr. Hrs. 3)

**Carbonate Sedimentology (Cr. Hrs. 3)**

Introduction, Classification of Carbonate Rocks According to Depositional Texture, Evolution from Sediment to Rock: Carbonate Sedimentation and Diagenesis, Carbonate Pore Classification, Environmental Controls, Depositional Environments, Modern and ancient examples of various important depositional environments. Facies and Depositional Systems of Carbonates, Sedimentary Facies Patterns, Depositional Models and Nomenclature, Carbonate Stratigraphy of Platform.

**Petroleum Structural Geology (Cr. Hrs. 3)**


**Regional Petroleum Geology (Cr. Hrs. 3)**

Introduction to Petroleum geology. Geologic and Geographic occurrences and economics of Unconventional oil and gas resources like very viscous oil and gas from low-permeability rocks, coal bed, and hydrates. Petroleum systems overview. Regional petroleum Exploration History and major discoveries. Case studies of significant discoveries of Pakistan, Middle East, Asia, Europe and America. Current and future global exploration strategies.

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**NATIONAL CENTRE OF EXCELLENCE IN ANALYTICAL CHEMISTRY**

The National Centre of Excellence in Analytical Chemistry was established in July 1976 under an Act of Parliament as an autonomous body administered by the Federal Ministry of Education and its academics as per statutes of the Act while UGC & present Higher Education Commission.

The Centre is entrusted with the main task of establishing research facilities in Analytical Chemistry leading to M. Phil and Ph. D. degrees. A significant number of M. Phil and Ph. D’s have qualified from this institution. The Centre has strong linkages with several international institutions and has also produced number of international research publication to its credit. It is regarded as one of the most strong and prestigious research institution in the country.
Mission

To be a leading research Centre that will actively contribute to the generation and dissemination of new knowledge and the enhancement of quality of life for the betterment of the society.

- To promote active participation of all researchers in Chemistry.
- To administer and coordinate optimally all funded research.
- To establish strategic research areas in Analytical Chemistry relevant to our local needs.
- To provide consultancy services and excellent collaborative research to public and private sectors through strategic partnerships.

In Pursuing this Policy, the NCEAC Seeks to:

- Develop and promote as a premier research Centre in Pakistan specialized research areas in the frontier of knowledge and cutting edge technology in which it is, or has the potential to be a national and international leader.
- Develop the research skills of its researchers.
- Continually improve the quality of its research monitoring and output.
- Provide quality learning and research opportunities and resources.
- Promote good research practice and conduct.
- Encourage and establish international linkages.
- Disseminate information about research.

The session commence in July,

Pre-Entry Test on June 15

The Faculty comprises:

MEMON SHAHABUDDIN, Professor & Director
Ph.D. (Turkey.), Postdoc USA

SHEERAZI SYED TUFAIL H., Professor
Ph.D. (S,U) Postdoc Cana

SIRAJUDDIN, Professor
Ph.D. (Peshawar) Postdoc
KAZI TASNEEM G., Professor
Ph.D. (S.U) Postdoc

NIZAMANI SHAFI M., Professor
Ph.D. (USA) Postdoc Australia

MEMON NAJMA, Assoc. Professor
Ph.D. (S.U) Postdoc

SOLANGI AMBER R., Assoc. Professor
Ph.D. (S.U) Postdoc Australia

TALPUR FARAH NAZ, Assoc. Professor
Ph.D. (S.U) Postdoc Turkey

AFRIDI HASSAN IMRAN, Assist. Professor
Ph.D. (S.U) Postdoc

BALOUCH AAMNA, Assist. Professor
Ph.D (S.U) Postdoc Malaysia

MAHESAR SARFARAZ AHMED, Assist. Professor
Ph.D (S.U) Postdoc Turkey

AYAZ ALI MEMON, Assist. Professor
Ph.D (S.U)

JAMEEL AHMED BAIG, Assist. Professor
Ph.D (S.U)

HUMA ISHAQUE SHEIKH, Lecturer
B.S (S.U)

MS/M. Phil in Analytical Chemistry : 4-Semester Program (40)
Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.

1st Semester

CHEM-701 Atomic Spectroscopy (2 Cr)
CHEM-702 Molecular Spectroscopy (2 Cr)
CHEM-703 NMR/MS (3 Cr)
CHEM-704 Electro analytical Techniques (2 Cr)
CHEM-705 Chemo metrics in Analytical Chemistry-I (2 Cr)
CHEM-707 Environmental Chemistry (1 Cr)
CHEM-708 Chemical safety (Non Cr)

2nd Semester

CHEM-752 Chromatographic Techniques (2 Cr)
CHEM-753 Chromatographic in Analytical Chemistry-II (3 Cr)
CHEM-754 Electronics (1 Cr)
CHEM-756 Environmental Analytical Chemistry (1 Cr)
CHEM-758 Nanotechnology/Biosensors (2 Cr)
CHEM-759 Polymer Chemistry (2 Cr)
CHEM-760 Scientific Writing in Analytical Chemistry (Non Cr)
CHEM-761 Thermal Methods (1 Cr)

CHEM-701 Atomic Spectroscopy

Introduction: Theoretical background, Absorption of radiant energy by atoms, Measurement of atomic absorption, Instrumentation: Emission system, classification of energy source, absorption system, selection system, electro thermal atomization, Applications: Analysis of water, fertilizers, plant material, soil, biological material, rocks, minerals and ores, petroleum and petroleum products, metallurgical products, food and beverages, industrial products, etc.

CHEM-702 Molecular Spectroscopy

UV-Visible: Basic concepts about EMR and its relationship with energy, wavelength etc. Transitions responsible for absorption, Beer-Lambert’s Law, Quantitative aspects of UV-Visible spectrophotometry, Plotting linear graphs using MS-Excel and calculations for quantifying unknowns. Applications of UV-Vis other than quantitative analysis, like; calculating binding constants, investigating photochemical reactions and use of spectrophotometer in Localized Surface Plasmon Resonance (LSPR).IR spectroscopy: Introduction to theoretical background of IR spectroscopy, Instrumentation of Dispersive and Fourier transform spectrometers, Sampling techniques of Dispersive and Fourier transform spectrometers(Liquids , Solids, Gases, Solutions), Applications of IR spectroscopy (Quantitative analysis, Qualitative analysis).
CHEM-702  NMR/MS (Nuclear magnetic resonance / Mass spectroscopy):

NMR (Nuclear magnetic resonance): Introduction, history, theoretical aspects, instrumentation, interpretation of NMR spectrum and elucidation of molecular structure. Applications of NMR spectroscopy and recent developments in the technique. MS (Mass spectroscopy): Introduction, history, theoretical aspects, instrumentation, fragmentation phenomenon and its types, recognition of peaks, mass spectrum and the elucidation of molecular structure, hyphenated techniques and new developments in mass spectroscopy as well as its applications.

CHEM-704  Electro analytical Techniques

Introduction, fundamentals and basic definitions of terms used in Electro analytical Chemistry. Definitions, background, introduction, principals, kinds, instrumentation and evaluation methods of following electro analytical techniques; Polarographic and Voltammetric Techniques, Potentiometry, Conductometry, Electrogravimetry and Coulometry.

CHEM-705  Chemometrics in Analytical Chemistry-I

Applications of various algebraic and statistical techniques in the analysis of one, two and multi-sample date. Use of Ns-Excel and SPSS to clarify and interpret analytical chemistry data by matrices, transforming, and univariate analysis.

CHEM-707  Environmental Chemistry


CHEM-708  Chemical Safety

Fundamental principles of the safe handling, use, storage and disposal of hazardous chemical substances. Survey of protective and emergency equipment, hazard evaluation, laws and regulatory statutes and liability.

CHEM-752  Chromatographic Techniques

Introduction to analytical separation techniques, Liquid-Liquid extraction and its relationship with chromatographic techniques, Theory of chromatography; rate theory, interactions responsible for separations, quantifying interactions by Linear Solvation Energy Relationship (LSER), Instrumentation; Mobile phases, type of columns, pumping system, Injection ports and detectors. Analytical separations and Chemical problem solving, Instrumentation and applications of Gas Chromatography, Ion chromatography & Capillary Electrophoresis and Hyphenated chromatography.

CHEM-753  Chemometrics in Analytical Chemistry-II
Applications of statistical techniques in Analytical Chemistry such as experimental design and optimization; Nonlinear regression analysis, Multivariate Multiple Linear Regression, Principal Components Analysis, Discriminant Analysis, and Cluster Analysis Linear Filters; Correlograms and Time Series Analysis, Fourier Transform Analysis. Factorial analysis of chemical spectra, Exploratory Data Analysis and Preprocessing in Calibration, Signal Processing; and pattern recognition from multisensor data, etc. use of MS-Excel and SPSS to clarify and interpret analytical chemistry data by clustering, transforming, and multivariate analysis.

**CHEM-754  Electronics  1 Cr**

Passive Elements: Resistance and resistors, capacitance and capacitors, coils and transformers, switches and their types, various kinds of plugs and sockets. Basic concept of Electricity: Electric current-direct and alternating, charge and current, Emf, P.D., voltage, P.D. of batteries in series and parallel, Ohm’s law, Kirchoff’s law. Active devices: Semiconductor diodes, transistors, integrated circuits, power supplies, and brief introduction to digital circuits.

**CHEM-756  Environmental Analytical Chemistry**


**CHEM-758  Nanotechnology/Biosensors**

Introduction and some Basic definitions, Background and different approaches in Nanotechnology, Initial research in Nanotechnology, Molecular Nanotechnology and Nanomaterials, Applications, synthesis, optimization studies and various methods of characterization of nanomaterials, Introduction to Sensors with basic definitions, Classification of sensors and their working detail, Nanomaterials in Sensor Technology, Quantum dots, Importance of nanosensors, General structure of chemical sensors, Detail of optical sensors and nanosensors, Construction and use of O₂ nanosensor, Test of verification of nanosensors, Fluorescent, Colorimetric and Electrochemical Nanosensors, Their fundamentals, methods of fabrication, applications, handling, storage and maintenance.

**CHEM-759  Polymer Chemistry**

Introduction, historical background, classification, types, nomenclature, syntheses, catalysis, mechanism, properties of polymers, polymer structure, stereochemistry, techniques of polymer syntheses and characterization, degradation, including new frontiers in polymer research, special topics in polymer chemistry and applications.

**CHEM-760  Scientific Writing in Analytical Chemistry**

An in-depth appreciation of career opportunities with a MS/M. Phil or Ph. D degree in Analytical Chemistry. Group and individual discussion of research activities in the Centre and research topic selection. Lectures shall cover the essential elements of synopsis and thesis writing, publishing original research at professional meetings (oral presentations and papers) and in peer-reviewed journals (original research manuscripts) and strategies for preparation of grant proposals.

**CHEM-761  Thermal Methods**
Introduction, history, theoretical background and instrumentation of DSC (Differential scanning calorimetry), TGA (Thermo-gravimetric analysis) and DTA (Differential thermal analysis). Recent developments and their applications in finding following properties of materials; Melting temperature, Heat of melting, Percent crystallinity, Tg or softening, Crystallization, Presence of recyclates/regrinds, Plasticizers, Polymer blends (presence, composition and compatibility), Compositional analysis of multi-component materials or blends, Thermal stabilities, Oxidative stabilities, Estimation of product lifetimes, Decomposition kinetics, Effects of reactive atmospheres on materials, Filler content of materials, Moisture and volatiles content.

**Ph.D in Analytical Chemistry: 6 Semester Program: (18 CH Course work)**

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

**1st Semester**

- CHEM-900 Supramolecular Chemistry (2 Cr)
- CHEM-901 Special Topics (1 Cr)
- CHEM-902 Food Analytical Chemistry (2 Cr)
- CHEM-903 Advanced Chromatographic Techniques (2 Cr)
- CHEM-904 Bioanalytical Chemistry (2 Cr)

**2nd Semester**

- CHEM-905 Forensic Analytical Chemistry (2 Cr)
- CHEM-906 Advances in Analytical Spectroscopy (2 Cr)
- CHEM-907 Advanced Electroanalytical Techniques (1 Cr)
- CHEM-908 Surface Analytical Chemistry (2 Cr)
- CHEM-909 Green Analytical Chemistry (1 Cr)
- CHEM-910 Chemoinformatics (1 Cr)

**CHEM-900 Supramolecular Chemistry**


**CHEM-901 Special Topics**

These topics will be assigned to the scholars in accordance with their research topic.
CHEM-902 Food Analytical Chemistry

Application of quantitative and qualitative physical, chemical, and instrumental methods of analysis to the examination of food products; evaluation of methods; data analysis; and interpretation of results. X-ray diffraction analysis of fibrous polymer structures such as nucleic acids, polysaccharides, and polypeptides.

CHEM-903 Advanced Chromatographic Techniques

Instrumentation and advantages of hyphenated chromatographic techniques, Ultra High Pressure Liquid Chromatography, LC/MS and LC/Tandem MS, Innovation in LC packing materials, Sample preparation techniques in Chromatography (GC and HPLC), GC/MS including maintenance and care.

CHEM-904 Bioanalytical Chemistry

Sample preparation; Common solvents and biological buffers; Centrifugation and separation; Spectroscopic Methods for Matrix Characterization; Quantitation of Enzymes and their Substrates; Immunological Methods & Quantitative Immunoassays, Biosensors; Molecular Tracer Labeling; Chromatography of Biomolecules and applications of NMR and Mass Spectrometry in analysis of Biomolecules; Methods and Protocols in Protein Blotting and Detection; Concepts and techniques in metabolomics.

CHEM-905 Forensic Analytical Chemistry

Applications of microscopy, chromatography, mass spectrometry and spectroscopy to the analysis of blood and other human and animal bodily fluids, soil and glass, paint, fire residues, drugs, and other chemical evidence. Extraction and analysis of DNA evidence by PCR-based methods including STR and SNP.

CHEM-906 Advances in Analytical Spectroscopy

Survey of selected topics in analytical applications of spectroscopic techniques. Seminars and in-class discussions on current trends in instrumentation and research in the field of spectroscopy.

CHEM-907 Advanced Electroanalytical Techniques

Electrochemical cells and thermodynamics, Electrified interfaces and double-layers, Electrochemical kinetics, Mass transport, Chronoamperometry, Chronocoulometry, Chronopotentiometry, Ultramicroelectrodes, Cyclic voltammetry, Pulse voltammetry, Hydrodynamic voltammetry, Stripping analysis, Inorganic electrochemistry, Organic and biological electrochemistry, Photoelectrochemistry, Electrochemiluminescence,

CHEM-908 Surface Analytical Chemistry

The course shall cover two major electron spectroscopy techniques, Auger Electron Spectroscopy (AES) and X-ray Photoelectron Spectroscopy (XPS/ESCA) with detailed understanding of the uses of AES, XPS/ESCA, and Data Processing for surface analysis and depth profiling, including sample preparation and mounting, spectrometer settings, optimizing analysis time, data interpretation, and report preparation.
CHEM-909  Green Analytical Chemistry

Detailed discussions environmentally-friendly alternatives to established analytical practices with focus on: origins of green analytical chemistry; basis of a greener analytical chemistry; green evaluation of existing analytical methods; avoiding sample treatments; greening sample treatments; multianalyte determination versus one-at-a-time methodologies; downsizing the methods; moving from wastes to clean wastes; ideas for a change of mentality and practices; practical consequences of green analytical chemistry.

CHEM-910  Chemoinformatics

Chemical informatics techniques, including chemical structure coding, chemical data representation, chemical database and search systems, molecular visualization, and modeling techniques. Applications in QSPR/QSAR, Structure-Spectra Correlations, Chemical Reactions and Synthesis Design, and Drug Design.

INSTITUTE FOR ADVANCED RESEARCH STUDIES IN CHEMICAL SCIENCES

The Institute is specially established in 2009, to promote Research in Chemical Sciences, to supplement facilities available at Dr. Kazi Institute of Chemistry and to maximize utilization of facilities available in the Central Resource Laboratories of the University.

The faculty comprises:

MEMON SAIMA Qayyum, Asstt. Professor Incharge
M.Sc, Ph.D (S.U)

M.Y. KHUHAWAR, Emeritus Professor.
Ph.D, DSc (Birm.)

KHUHAWAR TAJ MUHAMMAD, Asstt. Professor
M.Sc., Ph.D (S.U)
**MS/M.Phil in Chemical Sciences: 4-Semester Program (40)**

Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.

1st Semester

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ARCS 810</td>
<td>Molecular and Atomic Spectroscopy and its Applications</td>
<td>4</td>
</tr>
<tr>
<td>ARCS 811</td>
<td>Advanced Organic Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>ARCS 812</td>
<td>Separation Techniques</td>
<td>4</td>
</tr>
<tr>
<td>ARCS 813</td>
<td>Research Methodology and Statistics for Chemists</td>
<td>2</td>
</tr>
<tr>
<td>ARCS 814</td>
<td>Thermal Methods for Analysis</td>
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2nd Semester

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<tr>
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<td>ARCS 815</td>
<td>Automated Methods of Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ARCS 816</td>
<td>Recent Development in Inorganic Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>ARCS 817</td>
<td>Physical Chemistry of Polymers</td>
<td>2</td>
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2nd to 4th Semester

<table>
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<th>Course Title</th>
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<tbody>
<tr>
<td>ARCS 895</td>
<td>Research on approved topic, Thesis and its Defense</td>
<td>16</td>
</tr>
</tbody>
</table>

**Ph.D in Chemical Sciences: 6 Semester Program: (18 CH Course work)**

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

1st Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 900</td>
<td>Electrochemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 901</td>
<td>Advanced Analytical Spectroscopy and its applications</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 902</td>
<td>Techniques for the analysis of biomolecules</td>
<td>3</td>
</tr>
</tbody>
</table>

2nd Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 903</td>
<td>Science of water, principles of water and wastewater treatment</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 904</td>
<td>Advances in Separation Sciences</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 905</td>
<td>Special topics</td>
<td>3</td>
</tr>
</tbody>
</table>

3rd to 6th Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Research Ph.D. Thesis &amp; SPublic Defence</td>
<td>30</td>
</tr>
</tbody>
</table>
CHEM: 900  
Electrochemistry
Modern techniques and concepts in electrochemistry, equilibrium and dynamic electrochemistry, ion transport and voltammetry, electrochemical systems of increasing importance including chemically modified electrodes, fuel cells and solar energy conversion applications.

CHEM: 901  
Advanced Analytical Spectroscopy and its applications
Fundamentals of Photochemistry, Radiative Transitions – Absorption and Emission of Light, Non-radiative Transitions, Various Photophysical Processes, Laser Fundamentals, Some Spectroscopic Techniques; Uv-vis spectrophotometer; Fluorescence spectrometer; Absorption, emission and excitation spectra; Applications Theories of Coordination Chemistry, Chelation effect, and application of Coordination Compounds and organo-metallic compounds.

CHEM: 902  
Techniques for the analysis of biomolecules
Biological sample preparation, Solvents and biological buffers, Centrifugation and separation, Biosensors, Chromatography and capillary electrophoresis of Biomolecules, NMR and Mass Spectrometry techniques in analysis of Biomolecules.

CHEM: 903  
Science of water, principles of water and wastewater treatment
Properties of water (physical and chemical), Water, sustainability and development, Water, Sustainability and Development, Water quality management, surface and groundwater resource assessment and development, Water Quality; main water quality and pollution characteristics in rivers and lakes, different steps of the monitoring cycle in rivers and lakes, main factors in groundwater pollution and monitoring; Introduction to water treatment, Introduction to wastewater treatment, Coagulation, Sedimentation, Floc separation processes, Activated Sludge, Filtration, Biological filtration, Adsorption.

CHEM: 904  
Advances in Separation Sciences
Advances in Capillary electrophoresis, Microemulsion electrokinetic Chromatography (MEEC), non-aqueous capillary electrophoresis, Instrumentation and advantageous of hyphenated chromatographic techniques, Ultra High Pressure Liquid Chromatography, LC/MS, Innovation in LC packing materials, Sample preparation techniques in Chromatography (GC and HPLC).

CHEM: 905  
Special topics:
Review of literature, Introduction to thesis writing, Introduction to scientific manuscript writing, introduction to plagiarism, types of plagiarism; Nature of Chemical Interactions, Soft Materials, Micelles, Vesicles, Liquid crystals, Organogels, Hydrogels, Glasses, Molecular devices. How to synthesize molecules; a brief idea on the principles involved in organic synthesis, purification and characterization.

INSTITUTE OF BIOCHEMISTRY
Biochemistry is a vibrant & dynamic discipline. It is related to almost all the life sciences. It has developed into a major field with huge range of applications. Without biochemistry background & knowledge, a thorough understanding of health & well being is not possible. The sound knowledge of biochemistry can help the central concerns of the biomedical sciences.
The Institute of Biochemistry, University of Sindh, was established in August 1999 with the main objective of promoting research in the areas of nutrition & clinical Biochemistry.

The Institute has been offering 4 semester Master & M.Phil programs in Biochemistry. The 8 semester BS. (Biochemistry) program has been introduced from the 2003 session. The faculty imparts teaching & research work. At present, Thirteen (13) scholars are pursuing research studies for M.Phil & Ph.D degrees.

Biochemistry is also an excellent minor subject option for students majoring in biological sciences, such as, Physiology, Microbiology, Psychology, etc.

The Institute has well developed research laboratories where techniques like Fourier Transform/ Infrared Spectrometry (FTIR), Electrophoresis, Flame Photometry, Micro-lab, etc are being performed. In addition, the institute has its own Diagnostic & research laboratory which serves to the local population as well.

**Proud to be Biochemist. We explore secrets of life.** A degree in Biochemistry will give the tools to succeed in the 21st century.

The faculty comprises:

GHANHRO ALLAH BUX, Assoc. Professor & Director
M.Sc. 1988, Ph.D. 1999 (S.U)

KHAN MUHAMMAD YAKOOB, Professor
M.Sc. 1979, Ph.D. 1996 (S.U)

CHANNA NASEEM, Assoc. Professor

SHAH AFSHEEN, Lecturer

MEMON ALLAH NAWAZ , Visiting Professor
M.Sc. 1972, M.Phil. 1984, Ph.D. 1990 (S.U)

08 Lecturers

**MS/M.Phil in Biochemistry 4-Semester Program (40)**

Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.
1st Semester

BIOC 800  Advanced Research Methodology & Biostatistics (4)
BIOC 802  Applications of Techniques to Biomolecules (4)
BIOC 804  Community Nutrition (4)
BIOC 803  Applied Clinical Biochemistry (4)

2nd Semester

BIOC 808  Optional - I (4)
BIOC 810  Optional - II (4)
BIOC 812  Research project, Synopsis writing & Presentation (16)

2nd to 4th Semester

Research on approved topic, Thesis and its Defense

List of optional courses:

Students have to option any two (02) of following courses depending upon the expertise available

01. Plant Biochemistry
02. Applied Biochemistry & Microbiology
03. Forensic Biochemistry
04. Advanced Nutritional Care
05. Interpretive Clinical Biochemistry-I
06. Bioinformatics

BIOC.800  ADVANCED RESEARCH METHODOLOGY AND BIOSTATISTICS (THEORY)

Study Designs in Research: Sampling and observational studies: Cross-sectional Studies; Experimental Studies: Dissertation & write up & Presentation of Scientific data. Biostatistics: Introduction to Statistics and Biostatistics; Some Basic Concepts: Computers and Biostatistical Analysis. Significance tests: Testing a hypothesis; Principles of significance tests; Analysis of Variance; Completely Randomized Design (One-Way Analysis of Variance); Randomized Complete Block Design (Two-Way Analysis of Variance). Correlation and Regression:

BIOC.802  APPLICATIONS OF TECHNIQUES TO BIOMOLECULES (THEORY)

BIOC.804 COMMUNITY NUTRITION (THEORY)
Introduction to community nutrition, Determinants of nutrition- and health-related behaviors, Methods of assessment of nutritional status, Nutrition intervention schemes in the community: Breast feeding and its implications Hazards of bottle feeding - Review. Weaning foods, Nutrition and infection: Recent advances in Community Nutrition research: National and international agencies in community nutrition:

BIOC. 806 APPLIED CLINICAL BIOCHEMISTRY (THEORY)
Laboratory Safety: Specimen Collection: Errors of Laboratory instruments: The Clinical Laboratory: Urine and Other Body Fluids: Molecular Pathology: Cancer Testing:

PLANT BIOCHEMISTRY (THEORY)
Plant hormones. Biosynthesis of carotenoid pigments. Free amino acids, pyrimidines, purines and nucleosides in plants; Structure – function relationship of plant hormones. Phytochemicals: Introduction, Classification, Detailed study, Sources and functions in different diseases. Plant storage proteins; Nitrate Metabolism; Biological Nitrogen Fixation; Polyamine, metabolism; Phosphate, Sulphate and Iron metabolism.

APPLIED BIOCHEMISTRY & MICROBIOLOGY (THEORY)
Screening and Selection of Microorganisms of Industrial Importance. Development and Maintenance of Pure Culture.


Applications of DNA Recombinant Technology in Agriculture, Medicine and Industry. Important Microbial Products; Citric Acid, Lactic Acid, Gluconic Acid, Ethanol, Antibiotics, etc.

FORENSIC BIOCHEMISTRY (THEORY)
Introduction and applications of forensic Biochemistry. Role of Forensic Biochemist. Forensic examination of Body fluids, hair etc.

Identification of wild life materials such as skin, fur, bones, nails, horn, teeth, flowers and plants, by conventional and modern methods. Analysis of Beverages & Toxic Materials: (Narcotic Drugs and Psychotropic Substances): Systematic Extraction, Isolation, Identification, Estimation of following poisons from viscera, blood and urine.

ADVANCED NUTRITIONAL CARE (THEORY)

INTERPRETIVE CLINICAL BIOCHEMISTRY –I (THEORY)
BIOINFORMATICS (THEORY)


Ph.D in Biochemistry: 6 Semester Program: (18 CH Course work)

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

1st Semester

BIOC 900 Advanced Nutrition & Human Metabolism (4)
BIOC 902 Clinical Toxicology & Hormone disruption (4)
BIOC 904 Metallobiochemistry (4)

2nd Semester

BIOC 906 Optional - I (2)
BIOC 908 Optional - II (2)
BIOC 910 Optional - III (2)

Research project, Synopsis writing & Presentation

3rd to 6th Semester

Research on approved topic, Thesis and its Defense

List of optional courses:

(Students have to option any three(03) of following courses depending upon the expertise available)

01. Radiology & Radioisotopes
02. Genetically Modified Food
03. Food Toxicology & Allergy
04. Interpretive Clinical Biochemistry-II
05. Isozyme Analysis

BIOC: 900 Advanced Nutrition & Human Metabolism (THEORY)

CLINICAL TOXICOLOGY & HORMONE DISTRIBUTION (THEORY)  

BIOC. 904 METALLOBIOCHEMISTRY (THEORY)

OPTIONAL COURSES

RADIOLOGY & RADIO ISOTOPES (THEORY)
Radiation: Facts & fallacies. sources, effects on tissues, direct and indirect effects. Radiation-induced cancer of occupational, medical or military origin, recent controversial results for low level exposure, risk estimates. Effects of Radiation on Human Embryo & Foetus: Lethality, congenital abnormalities and late effects (leukaemia and childhood cancers), severe mental retardation. Doses involved.
Radioisotope Techniques: Introduction: Atomic Structure; Nature of Radioactive decay: Rate of Radioactive decay; Interaction of radioactivity with matter; Measurement of radioactivity; Applications of radioisotopes in the biological sciences.

GENETICALLY MODIFIED FOODS (THEORY)
Genetically Modified Crops; An explanation of GM crop technologies. Transformation methods for plants and animals. Ethical issues Concerning GM foods; testing for GMOs; Allergies And Disease; Damage to The Environment; Cross-Pollination; Food Web And Risks; Addressing Ethical Concerns for GM Foods. Labeling and traceability. Biosafety. Current trends & Case studies. Canola; wheat; Pesticide resistant rape plants; Insecticide sweet corn; Golden rice, Long-lasting tomatoes; Selected research topics on the production of genetically modified foods. Will GMOs solve world hunger?

FOOD TOXICOLOGY & ALLERGY (THEORY)
Natural Toxins in Food: Determination of toxicants in foods; classification and toxicity of natural occurring toxins; natural toxins in animal foodstuffs (meat and seafood); natural toxins in plant foodstuffs; fungal toxins occurring in foods (mycotoxins); micro-organisms and food; sites of action and their toxicity mechanisms. Food Allergies and Sensitivities. Environmental Contaminants and Drug Residues in Food. Food Additives and Toxicants formed during Food Processing. Dietary Supplements and Toxicity related to Dose. Food Allergens.

**INTERPRETIVE CLINICAL BIOCHEMISTRY –II (THEORY)**


**BIOC. 902 SOZYME ANALYSIS (THEORY)**


**INSTITUTE OF BIOTECHNOLOGY & GENETIC ENGINEERING**

The Centre For Advanced Studies in Biotechnology, established in January 2002 was upgraded to Institute in April 2003. The setting up of a separate Institute of Biotechnology and Genetic Engineering gave a fresh impetus to the development of the multidisciplinary field of modern biotechnology and Genetics. In present days the boundaries of Biotechnology and Genetics are expanding with fantastic speed and their topic areas are turning into independent fields of specialization. Biotechnology is broadly defined as a fusion between natural sciences (such as biology, biochemistry and genetics) and technological fields. The necessity of Biotechnology was felt years back and in this regard Enzyme and Fermentation Research Laboratory was established in the Institute of Chemistry in 1989. During this period, Eight (08) Ph.D. and Four (04) M.Phil degrees were awarded besides completion of Twelve (12) Research Projects sponsored by National and International funding agencies. So far One hundred and sixty (160) research articles have been published by the faculty in National and International Journals.

The Institute has established International linkage & collaboration with highly reputed research Laboratories and Institute, e.g., Institute of Biochemistry & Biophysics, University of Tehran, Iran and State key Laboratory of
Bioreactor Engineering, East China University of Science & Technology, Shanghai, China, Institute of Organic Chemistry & Biochemistry, University of Bonn and Department of Chemical Engineering, University of Bath, U.K. and HEJ Research Institute, University of Karachi to overcome its resource constraints. So far the Institute has organized three International Symposia on Biotechnology and two National training courses on Biotechnological techniques.

The Institute is presently offering following degrees programs:-

- B.S. in Genetics (8 Semesters)
- M.Sc. in Bio-Technology (4 Semesters),
- M.Phil & Ph.D. studies in Biotechnology

The faculty comprises:-

SYED HABIB AHMD NAQVI, Associate Professor & Director

QURESHI ABDUL SATTAR, Asstt. Prof.
M.Sc 2001, M.Phil 2008 (S.U)

MUHAMMAD RAFIQ, Asstt. Prof.
M.Sc., (BZU), M.Phi. (PU) 2002, Ph.D (SU) 2012

BHUTTO MUHAMMAD Aqeel, Asstt. Prof.
M.Sc., 2002 (S.U), M.Phil 2009 (S.U)

PROF. (R) DR. MUHAMMAD UMAR DAHOT, Visiting Scholar
M.Sc 1980 (SU), Ph.D 1989 (SU)

Two Lecturer & Six Teaching Assistant

**MS. M.Phil. in Biotechnology: 4- Semester Program (40)**
Pre-requisite: Master / 4 Years Graduation in relevant field; Pre-Admission Test.
1st Semester

BIOT-800-801  Protein Structure, Function and Engineering (3,1)

BIOT-802-803  Hormones and Growth Factors (3,1)
BIOT-804  Blood Chemistry and Diseases (3)

BIOT-805  Laboratory Assignment (1)
BIOT-806  Advance Molecular Genetics (3)

2nd Semester

BIOT-808  Bioprocess Engineering (4)

BIOT-810  Current Issues in Biotechnology (4)

3rd & 4th Semester

BIOT-815  Research Project & Thesis (16)

BIOT-800  Protein Structure, Function and Engineering

BIOT: 801  Protein Structure, Function and Engineering
(Practical)
Isolation of protein, Separation of protein by column/ion-exchange chromatography, Separation of protein by electrophoresis, Determination of amino acid composition of protein

BIOT-802  Hormones and Growth Factors


BIOT: 803  Hormones and Growth Factors Practical
Isolation of plant growth hormones, Separation of plant hormones by chromatographic method, Determination of plant growth hormones by spectrophotometry , Hormonal effect on rabbit & mice growth
**BIOT-804  Blood Chemistry and Diseases**

**Blood composition:** Introduction to blood and blood cell types.

**Blood Chemistry:** Blood biochemical and mineral analysis.

**Hematopoiesis:** mechanism of regulation, disorders of hemoglobin structure and synthesis. Molecular immunotherapy by gene transfer and DNA based immunization.

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**BIOT-805  Laboratory Assignment**

Blood Tests for Na, K, Urea, Cholesterol, Glucose, Total Protein, AG ratio. Enzyme activity, uric acid and LFT in blood.

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**BIOT-806  Advance Molecular Genetics**


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**BIOT-807  Advance Molecular Genetics (Practical)**

Diagnosis of infections disease through ELISA, PCR., Genetic transformation of plants using biolistic method. Detection of foreign genes in plant through PCR, Southern blotting, gene expression. Detection of foreign protein in plants through western blotting, northern blotting.

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**BIOT-808  Bioprocess Engineering**

Concepts of Bioprocessing, bioreactors design. Effects of micro mixing, precipitation, turbulent mixing & chemical reactions, effects of shear stress on plant and animal cells, fungi solid cultures. Problems and challenges in the production and processing of biologically active material, sensing techniques for bioprocess monitoring and control. Traditional industrial bioprocesses: aerobic and anaerobic bioprocesses. Applications of Bioprocessing and engineering in biological waste treatment, tissue engineering, gene therapy, and for production of pharmaceuticals and biologics.

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**BIOT-810  Current Issues in Biotechnology**

DR. M.A. KAZI INSTITUTE OF CHEMISTRY

Department of Chemistry, founded in 1953 has the distinction of being the very first department under the then Faculty of Science established at the Elsa Kazi Campus of the University in Hyderabad. The department was shifted to Allama I.I. Kazi Campus, Jamshoro in 1961. The status of the department was raised to that of the Institute of Chemistry in 1967. The Institute was named as Dr. M.A. Kazi Institute of Chemistry in 1999 after he name of its founder Chairman & Director (Late) Professor Dr. Mumtaz Ali Kazi.

The Institute has been offering undergraduate, graduate and doctoral research programs in Analytical, Organic, Inorganic, Physical and Natural Products Chemistry. Since its inception the Institute has catered to the human resources requirements of the country in general and the region in particular. The graduates of this Institute are holding key posts in the country as well as abroad.

The Institute has 24 spacious and equipped laboratories with highly qualified faculty. The Institute has to date awarded 53 Ph.D. degrees in addition to a number of M.Phils., since the introduction of doctoral research program in 1961.

The Institute also has the distinction of two of its graduates (i) Late Prof. Dr. Zafar Hassan Zaidi and (ii) Prof. Dr. M.Y. Khuhawar, been admitted to the degrees of Doctor of Science (D.Sc.) by the University of Leeds and the University of Birmingham, U.K. respectively, for their outstanding contributions towards research in their fields of specialization.

The Institute presently offers 4-yr., B.S. Chemistry, 2-yr. M.Sc. (Pass) program both in the Morning as well as Evening, besides MS/ M.Phil and Ph.D. programs.

The present faculty comprises:

VASANDANI ABDUL GHAFFAR, Professor & Director
M.Sc., Ph.D. 1987 (S.U)

KHASKHELI GHULAM QAUDIR, Professor
M.Sc. 1985, Ph.D. 1991 (S.U)

RIND MEHBOB ALI, Professor
M.Sc. 1988, Ph.D. 2004 (S.U)

MASTOI GHULAM MURTAZA, Professor
M.Sc. 1991, Ph.D. 2003 (S.U)
ABBASI KULSOOM, Assoc. Professor

MALLAH ARFANA BEGUM, Assoc. Professor
M.Sc. (QAU) 1998, M.Phil. (SU) 2002, Ph.D 2012

BUGHIO MUHAMMAD NAWAZ, Asstt. Professor
M.Sc. 1976, M.Phil. 1987 (S.U)

LAGHARI ABDUL JABBAR, Asstt. Professor

MEMON JAMIL-UR-REHMAN, Asstt. Professor
M.Sc 2001 (S.U), Ph.D 2009 (S.U)

SYED AMBREEN SHAH, Asstt. Professor
M.Sc. (S.U) 2001, Ph.D

MEMON GHULAM ZOHRA, Asstt. Professor

KHAN HUMERA ASAD, Asstt. Professor
M.Sc. 2002, Ph.D. 2008 (S.U)

MUGHAL MOINA AKHTAR, Asstt. Professor
M.Sc. 1993, M.Phil. 2003 (S.U)

MEMON NUSRAT NAEEM, Lecturer
M.Sc. (SAL) 2001, Ph.D 2011

SOLANGI IMAM BUX, Lecturer
Ph.D (S.U) 2011

RIND MOULA BUX, Chemical Analyst
M.Sc. 1986, M.Phil. 2000 (S.U)
KHUHAWAR MUHAMMAD YAR, Professor (Emeritus)

QUreshi Abdul ShakoO, (Visiting Professor)
M.Sc. (S.U) 1975, Ph.D. (Leipzig, Germany) 1983

Shaikh Muhammad Suleman, Professor (on Contract)
M.Sc. (S.U) 1974, Ph.D. (Moscow State) 1984

Bhatti Abdul Ghafoor, Professor (on Contract)
M.Sc. 1975, Ph.D. 1990 (S.U)

Memon Muhammad Aslam, (Visiting Professor)
M.Sc. 1975, Ph.D. 2000 (S.U)

02 Assistant Professor and 07 Lecturers

M.Phil/ MS. in Analytical Chemistry: 4-Semester Program (40)
Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.
1st Semester

CHEM 800 Laser and Emission Spectroscopy (3,1)
CHEM 802 Radioanalytical Methods (3,1)
CHEM 804 Environmental Analysis (3,1)
CHEM 806 Electroanalytical Analysis (3,1)

2nd Semester

CHEM 808 Chromatographic Techniques/Thermal methods (3,1)
CHEM 810 Quality Assurance, Automated (3,1)

2nd to 4th Semester


M.Phil/ in Inorganic Chemistry: 4-Semester Program (40)
Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.
1st Semester
CHEM 812  Solid State Chemistry (3,1)
CHEM 814  Group Theory (4)
CHEM 816  Chemistry of Organometallic Compounds (3,1)
CHEM 818  Medicinal uses of Transition Metals/Inorganic compounds (3,1)

2nd Semester
CHEM 820  Photochemical reactions of transition metals (3,1)
CHEM 822  Applied Transition metal catalytic chemistry (3,1)

2nd to 4th Semester
CHEN 895  Research study on approved topic. Thesis/Dissertation and defense (16)

M.Phil/MS in Organic Chemistry 4-Semester Program (40)
Pre-requisite: Master / 4 Years Graduation in relevant field; Pre-Admission Test.
1st Semester
CHEM 822  Modern Trends in Organic Synthesis (3,1)
CHEM 824  Advanced Stereochemistry (3,1)
CHEM 826  Advanced Natural Products (3,1)
CHEM 828  Advanced Spectroscopy (3,1)

2nd Semester
CHEM 830  Organic Polymer Chemistry (3,1)
CHEM 832  Organic Photochemistry (3,1)

2nd to 4th Semester
CHEN 895  Research study on approved topic. Thesis/Dissertation and defense (16)

M.Phil/MS in Physical Chemistry 4-Semester Program (40)
Pre-requisite: Master / 4 Years Graduation in relevant field; Pre-Admission Test.
1st Semester
CHEM 834  Physical Chemistry of high polymers (3,1)
CHEM 836  Quantum Chemistry (3,1)
CHEM 838  Advanced Chemical Kinetics (3,1)
CHEM 840  Photochemistry (3,1)

2nd Semester

CHEM 842  Surface Chemistry (3,1)
CHEM 844  Nuclear and Radiochemistry (3,1)

3rd to 4th Semester

CHEN 895  Research study on approved topic. Thesis/Dissertation and defense (16)

Ph.D in Analytical Chemistry: 6 Semester Program: (18 CH Course work)

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

1st Semester

CHEM 900  Classical Methods of Analytical Chemistry (3)
CHEM 902  Sampling and Preparation of Analysis Samples (3)
CHEM 904  Spectrophotometric, Electroanalytical Techniques (3)

2nd Semester

CHEM 906  Separation Techniques and their Applications in Analytical Chemistry (3)
CHEM 908  Automated and Discrete Methods of Analysis, Auto Sample, Flow Injection Analysis, Thermogravimetric Analysis (3)
CHEM 910  Applications of different Spectroscopic Techniques in Organic and Inorganic (3)

Ph.D in Inorganic Chemistry: 6 Semester Program: (18 CH Course work)

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

1st Semester

CHEM 920  Bonding in Metal Complexes, Inorganic Reaction Mechanism (3)
CHEM 922  Organometallic Chemistry (3)
CHEM 924  Nuclear Chemistry, Bio-Inorganic Chemistry (3)

2nd Semester
CHEM 926  Physical Methods in Inorganic Chemistry (3)
CHEM 928  Chemical Crystallography, Solid State Chemistry (3)
CHEM 930  Nanotechnology (3)

Ph.D in Organic Chemistry: 6 Semester Program: (18 CH Course work)

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

1st Semester
CHEM 940  Advanced Organic Polymer Chemistry (3)
CHEM 942  Organometallic Compounds in Organic Chemistry (3)
CHEM 944  Principles and Practice of Spectrophotometric Methods used in Drug Analysis (3)

2nd Semester
CHEM 946  Nuclear Magnetic Resonance in Organic Chemistry (3)
CHEM 948  Design of Organic Synthesis(3)
CHEM 950  Biosynthesis of Natural Products (3)

Ph.D in Physical Chemistry 4 Semester Program: (18 CH Coursework)

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

1st Semester
CHEM 960  Advance Electrochemistry (3)
CHEM 962  Thermodynamics of Biochemical Reactions (3)
CHEM 964  Group Theory-I (Fundamental Concepts) (3)

2nd Semester
INSTITUTE OF INFORMATION AND COMMUNICATION TECHNOLOGY

Phenomenal and rapid development of technology led the University of Sindh to establish independent "Institute of Information Technology", bifurcating the former Institute of Physics and Technology working since 1979, to extend its scope as a beacon for Information Technology education at national and international levels. Recently the Institute has been re-designated as Institute of Information and Communication Technology (IICT). The Institute imparts cutting-edge education with outstanding quality through its highly qualified faculty at graduate and postgraduate levels to produce top-notch professionals in core ICT related disciplines.

Programs are run jointly by the four component disciplines of Electronics, Telecommunications, Information Technology and Software Engineering. The institute is offering 8-semesters programs, BS Information Technology, BS Telecommunications, BS Electronics and BS Software Engineering. The 8-semesters Bachelor degrees lead to 4-semester MS programs in the respective disciplines.

In addition, the Institute has introduced Evening programs in the disciplines of Information Technology BS(IT), Software Engineering BS(SE), M.Sc Telemedicine and E-Health, M.Sc E-Commerce, M.Sc Multimedia, two-years MIT for BSIT(Pass), and one year Post Graduate Diploma in Information Technology.

Institute also offers MS, M.Phil and Ph.D degree programs and has been enrolling students since its inception in addition to its Bachelor level programs. The faculty continues its quest to publish research work in Journals of National and International repute.
The Institute is well furnished with all required infrastructure of excellent learning including state-of-art computer, electronics, and communication laboratories connected to information cyberspace via PERN link of 32MB bandwidth, spacious class rooms with multimedia facilities, the information resource, computerized internal library, located within the premises of ICT with abundant and latest editions of books, journals and magazines related to the disciplines being offered and provides facilities for indoor and outdoor co-curricular and extra co-curricular activities of students.

The present faculty comprises:

**SHAIKH ASAD ALI, Professor and Director**

**ISMAILI IMDAD ALI, Professor**
M.Sc Electronics (SU) 1985, DIC &Ph.D (Imperial College, UK) 1996

**KHOUMBATI KHALIL –UR- REHMAN, Professor (on Lien)**
M.Sc. Computer Technology (S.U) 1990, Ph.D (Brunel) 2005

**LACHHMAN DAS, Professor**
M.Sc Computer Technology (S.U) 1991, Ph.D (University of Sussex, UK) 2011

**SHAH AZHAR ALI, Associate Professor**
M.Sc, Electronics and M-Phil (S.U), Ph.D (Nottingham) 2011

**ARIJO NIAZ HUSSAIN, Lecturer**
BCIT 2002 (S.U), Ph.D 2011

11 Assistant Professors & 20 Lecturers

**MS./ M.Phil. in Information Technology: 2-yr, 4- Semester Program (40)**
Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.

**1st Semester**

- IT 800 Advanced Networking (4)
- IT 802 Computer Vision (4)
- IT 804 Research Methods (4)
IT 806 Designing and Modeling (4)

2nd Semester

IT 808 Management Information system Applications (4)
IT 810 Neural Networks (4)

2nd to 4th Semester


MS./ M.Phil. Telecommunication: 4- Semester Program (40)

Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.

1st Semester

TELEC 800 Advanced Data Communication (4)
TELEC 802 Advance DSP & Filter (4)
TELEC 804 *Elective-I
TELEC 806 *Elective-II

2nd Semester

TELEC 808 *Elective-III
TELEC 810 *Elective IV

2nd to 4th Semester


* List of Electives available with the Director

Ph.D 6- Semester Program 18 CH courses under preparation

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.
The Institute of Mathematics and Computer Science was established in 1986 by upgrading the Department of Mathematics founded in 1953. At present its major components are: Mathematics and Computer Science. The Institute developed its research programs for M.Phil. and Ph.D. degrees in 1991 and has been enrolling students since then. This is in addition to the Bachelor and Master programs both in Mathematics and Computer Sciences.

The pre-requisite for the Bachelor Program in Computer Science has been extended to include Pre-Engineering, Pre-Medical, General Science and Commerce groups of H.S.C. The Institute also offers BS Computer Science program in the Evening, besides Diploma and short courses in Computer Science, developing Computer awareness among academic and administrative staff, students and masses.

The Institute has been updating and revising course contents to keep its degrees market oriented.

The curricula listed here have been recently updated under the revised scheme; the 4-yr Bachelor degrees have been designated as Bachelor of Science (Mathematics) OR Bachelor of Science Computer Science BS (CS). However, 3-year B.C.S. (Pass) degree can also be availed.

The faculty comprises:

SHAIKH NOOR AHMED, Professor & Director

CHANDIO MUHAMMAD SALEEM, Professor
M.Sc. (S.U) 1985, Ph.D. (Brunel) 2002

MEMON RIAZ AHMED, Professor
M.Sc. (S.U) 1986, Ph.D. (Shanghai) 1993

SOOMRO ABDUL SATTAR, Professor
M.Sc. (S.U) 1986, Ph.D. (China) 1994

BALOCH MUJEEB-U-REHMAN MAREE, Asstt. Professor
M.Sc. (S.U) 1988, Ph.D (China) 2006

HUSSAINI NAZISH NAWAZ, Asstt. Professor
M.Sc. (SU), M.Phil (SU)

KEERIO AYAZ, Asstt. Professor
M.Sc. (S.U), Ph.D(UK) 2011

MEMON ABDUL GHAFOOR, Asstt. Professor
M.Sc. (S.U) 1988, Ph.D (China) 2006

MEMON ASLAM PERVAIZ, Asstt. Professor
M.Sc. (S.U), M.Phil (SZABIST)

MEMON FARHAT NOUREEN, Asstt. Professor
M.Sc. (S.U) 1999, Ph.D (UK) 2012

NIZAMANI. QURAT-UL-AIN, Asstt. Professor

SHAIKH ABDUL WASIM, Asstt. Professor
M.Sc. (S.U) 1990, Ph.D. (China) 2006

CHANDIO FIDA HUSSAIN, Lecturer
M.Sc. (S.U), Ph.D (UK) 2011
M.Phil./ MS. in Mathematics 4- Semester Program (40)

Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.

1st Semester

MATHS 800 Research Methodology (4)
MATHS 801 Mathematical Analysis Real, Complex, Functional (4)
MATHS 802 Electiv-I (4)
MATHS 803 Elective-II (4)
2nd Semester

MATHS 804  Advanced Numerical Analysis (4)
MATHS 805  Elective-I (4)

2nd to 4th Semester


**Elective courses**

Two Elective Courses from the list available with the Director are to be offered in 1st Semester and one in 2nd Semester, subject to availability of faculty; minimum 3 students are to offer the course.

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**Computer Science Programs**

**MS/ M.Phil/ in Computer Science: 4- Semester Program (40)**

Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.

**1st Semester**

- COM 815  Research Methodology (4)
- COM 821  Theory of Computation (4)
- COM 823  Advanced Computer Operating system (4)
COM 824  Elective-I

2nd Semester

COM  Elective-II

COM  Elective-III

**Elective courses**

**One** Elective to be offered in 1st Semester and **Two** in 2nd Semester. List of elective courses available with director; minimum 3 students are to offer the course, subject to availability of faculty.

2nd to 4th Semester

COM 895  Research on approved topic, Thesis and its Defense (16)

**Ph.D in 6 Semester Program: 18 CH Course work Courses under preparation.**

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

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**Bioinformatics program**

Candidates with a minimum of 16 years of schooling, possessing at least second class Master's degree or 4 year Bachelor degree of the University of Sindh / Universities / Institute recognized by the Higher Education commission of Pakistan in the subjects in Science / Engineering/ Technology/ Agriculture/ Medicine/ Veterinary Science/ Pharmacy and qualifying pre-admission test may be allowed to seek enrolment for Research Studies which may lead to the degree of MS/M.PHIL in Bioinformatics.

The MS/M.PHIL program will be of a minimum of two years (4 semesters) duration comprising mainly course work of 16 Credit Hour (CH) courses during first semester and 8 CH courses during the 2nd semester, besides thesis research on the topic duly approved by the Advanced Studies and Research Board, on the recommendations of the supervisor and Scrutiny Committee. Further regulations, terms and conditions of University of Sindh for Registration to Research Studies leading to MS/M.PHIL degree are being followed for Bioinformatics program.

1st Semester

MBI 800 – 801  Introduction to Bioinformatics (3,1)

Elective Course-I (3,1)

Elective Course-II (3,1)
Elective Course-III (3,1)

2nd Semester

MBI 802-803  DBMS with reference to Biological Data (3,1)
MBI 804-805  Genomics and Gene Networks (3,1)

3rd & 4th Semester

MBI 840  Research on approved topic, Thesis and its Defence
MBI 842  Viva Voce

Elective courses:

MBI-830  Fundamentals of Molecular Biology (Theory)
MBI-831  Fundamentals of Molecular Biology (Practical)
MBI-832  Fundamentals of Biochemistry (Theory)
MBI-833  Fundamentals of Biochemistry (Practical)
MBI-834  BioStatistics (Theory)
MBI-835  BioStatistics (Practical)
MBI-836  Essential Mathematics (Theory)
MBI-837  Essential Mathematics (Practical)
MBI-838  Introduction to Programming (Theory)
MBI-839  Introduction to Programming (Practical)

Note:

i. Students having background in Biology will study the following courses:

   MBI-834 - 835, MBI-836 - 837 and MBI-838 - 839

ii. Students having background in Mathematics will study the following courses:

   MBI-830 - 831 and MBI-832 - 833
One course from MBI-834 - 835, or MBI-836 - 837, or MBI-838 - 839

**MBI 830 – 831 FUNDAMENTALS OF MOLECULAR BIOLOGY**

To understand the basic structures and their functions. To understand the folding concepts of different structures. To understand the laws of thermodynamics and its applications.

**MBI 832 – 833 FUNDAMENTALS OF BIOCHEMISTRY**

This course will provide fundamental concepts in biochemistry, which focuses upon the major macromolecules and chemical properties of living systems. Primary topics include the structure, properties, and functions of amino acids, proteins, carbohydrates, lipids and nucleic acids.

**MBI 834-835 BIOSTATISTICS**

The course provides an elementary statistics and probability with applications. The course also provides a broad treatment of statistics, concentrating on specific statistical techniques used in science and industry such as confidence intervals, and hypothesis testing.

**MBI 836 – 837 ESSENTIAL MATHEMATICS**

A course of mathematics for students who have studied math in their high schools is intended to be self-contained. It is possible to follow, without any background in math. It covers all the essential material that is a traditional course.

**MBI 838-839 INTRODUCTION TO PROGRAMMING**

This Course is aimed at students with little or no knowledge experience. The course aims to help students in understanding basic concepts and role of computation can play in solving problems using computer programs. In this course a programming language will be used.

**MBI 800-801 INTRODUCTION TO BIOINFORMATICS**

The interdisciplinary course will provide hands-on approach to students in the topics of bioinformatics. Learning basics of Bioinformatics. Learning genes and genomes. Understanding the alignment concepts. Learning methods of similarity searching.

**MBI 802- 801 DBMS with reference to Biological data**

The course is designed to provide the foundations of database systems basis such as the relational algebra and data model, query optimization, query processing, and transactions. Understanding the role of DBMS in Bioinformatics. Understanding some well-known sequence data bases.

**MBI 804 – 805 GENOMICS AND GENE NETWORKS**
Understanding the organization and structure of genome. Learning the Human Genome Project. Understanding the single nucleotide polymorphisms. Understanding DNA sequencing strategies. Learning the use of Web based servers.

**INSTITUTE OF PHYSICS**

Institute of Physics (formerly Department of Physics) is one of the oldest departments (established in 1955) of University of Sindh Jamshoro. It was upgraded and named as Institute of Physics and Technology in 1979. In 1998 Physics and Technology disciplines were separated and given independent status as Department of Physics and Institute of Information Technology. Department of Physics was again upgraded to the present status of **Institute of Physics** in 2005.

Institute of Physics offers BS (four years) and M.Sc (Two Years) Physics. In addition, it offers MS/M.Phil. and Ph.D degree programs in the following areas:

i. Experiential High Energy Physics

ii. Laser Spectroscopy

iii. Neuro Physics

iv. Condensed Matter and Material Physics

v. Semiconductor Physics

vi. Ion Trapping

Recently, 18 CH course for Ph.D degree program has been introduced as per criteria approved by the HEC, which provides an excellent forum for students to develop and enhance their specialist and other more general theoretical and research skills. The Institute of Physics welcomes post-graduate applications from prospective students in this program. Successful applicants after completing 18 CH course can pursue their research as full-time students leading to Ph.D.

The faculty comprises:

**MUGHAL AKHTAR HUSSAIN, Professor & Director**


**KALHORO MUHAMMAD SIDDIQUE, Professor**

M.Sc. (S.U), Ph.D. (London), 1999
SHAIKH NEK MUHAMMAD, Asstt. Professor  
M.Sc. 1993, Ph.D. 2007 (QAU)

MARI RIAZ HUSSAIN, Asstt. Professor  
M.Sc. (SU), 1999, Ph.D (Nottingham, UK) 2012

MEMON IRFAN ALI, Asstt. Professor  
M.Sc. (QAU), 1993, Ph.D (London)

NIZAMANI ALTAF HUSSAIN, Asstt. Professor  
M.Sc. (SU), 1996, Ph.D (Sussex, UK) 2011

01 Assistant Professors & 08 Lecturers

**MS/ M.Phil. in Physics: 2-yr. 4- Semester program (40)**

Pre-requisite: Master / 4 Years Graduation in relevant field ; Pre-Admission Test.

**1st Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 800</td>
<td>Modern Experimental Techniques</td>
<td>4</td>
</tr>
<tr>
<td>PHY 802</td>
<td>Counting Statistics and Error Prediction</td>
<td>4</td>
</tr>
<tr>
<td>PHY 804</td>
<td>Frontiers in Physics</td>
<td>4</td>
</tr>
<tr>
<td>PHY 806</td>
<td>Advanced Computational Techniques</td>
<td>4</td>
</tr>
</tbody>
</table>

**2nd Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 808</td>
<td>Elective-I</td>
<td>4</td>
</tr>
<tr>
<td>PHY 810</td>
<td>Elective-II</td>
<td>4</td>
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</table>

**2nd to 4th Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 895</td>
<td>Research on approved topic, Dissertation Defense</td>
<td>16</td>
</tr>
</tbody>
</table>

**List of Elective - I Courses**

01. Gaseous Detectors
02. Basic Course in Neuro Physics
03. Condensed Matter and Materials Physics
04. Atomic and Molecula Spectroscopy
05. Ion Trapping
06. Semiconductor Physics and Devices-I

**List of Elective - II Courses**

01. Detection Systems
02. Basic Signal Processing in Physics
03. Techniques in Materials Science
04. LASER Induced Breakdown Spectroscopy
05. Light-Atom Interaction and LASER Cooling
06. Semiconductor Physics and Devices-II

**Note:** Students have to opt One (01) course from the list of Elective-I and one (01) course from the list of Elective-II with consultation from his/her supervisor.

**Ph.D 6 Semester Program: 18 CH Course work Courses under preparation.**

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

**1st Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 900</td>
<td>Experimental Techniques</td>
<td>(3)</td>
</tr>
<tr>
<td>PHY 902</td>
<td>Data and Error Analysis</td>
<td>(3)</td>
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</table>

*Optional Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PHY 904</td>
<td>High Energy Physics</td>
<td>(3)</td>
</tr>
<tr>
<td>PHY 906</td>
<td>LASER Spectroscopy</td>
<td>(3)</td>
</tr>
<tr>
<td>PHY 908</td>
<td>Neuro Physics</td>
<td>(3)</td>
</tr>
<tr>
<td>PHY 910</td>
<td>Condensed Matter Physics</td>
<td>(3)</td>
</tr>
<tr>
<td>PHY 912</td>
<td>Trapping and Cooling of Ions</td>
<td>(3)</td>
</tr>
<tr>
<td>PHY 914</td>
<td>Semiconductor Materials</td>
<td>(3)</td>
</tr>
</tbody>
</table>

* One Course needs to be selected

**2nd Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PHY 916</td>
<td>Experimental Physics</td>
<td>(3)</td>
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</table>

*Optional Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 918</td>
<td>Modern Experimental High Energy Physics</td>
<td>(3)</td>
</tr>
<tr>
<td>PHY 920</td>
<td>Modern Particle Physics</td>
<td>(3)</td>
</tr>
</tbody>
</table>
Institute of Plant Sciences

University of Sindh is the second oldest university of Pakistan. Botany and Mathematics were the first among the science subjects in which postgraduate teaching was started in the University in 1954.

Mr. S.W.S Qadri, the then Professor of Botany at the Government College Hyderabad was commissioned by the University to do the teaching. Only 4 students took admission. By the grace of Allah now more than 400 students studying at the Institute of Botany which is upgraded as Institute of Plant Sciences, since 2008.

The faculty includes 01 Emeritus Professor, 01 Professor, 02 Associate Professors, 06 Assistant Professors, 04 Lecturers and 01 Teaching Assistant. The Institute has well equipped Laboratories, Herbarium, Arboretum and two small Botanical Gardens.

The Institute has introduced M.Phil / Ph.D. programs since 1965. So far many scholars have obtained their M.Phil and Ph.D. degree in Botany. After Chemistry, Botany is second largest M.Phil and Ph.D. degree awarding in Science Faculty. The Institute is committed to provide advance knowledge about plants to the society and students at large.

The Institute of Plant Sciences offers program leading to the Bachelor of Science / Master of Science and Master of Philosophy and the Doctor of Philosophy degree in a variety of special areas including Plant Taxonomy, Physiology, Psychlogy, Mycology and Plant Pathology, Genetics, Paleobotany, Ecology & Environmental Studies. 4-yr. Forestry degree has been introduced as Evening program from 2010 session, besides Postgraduate Diploma in Medicinal Plants.
Students are urged to take courses which provide a broad background in Botany as well as in other Natural Sciences, in addition to the training in special areas.

The faculty comprises:

MANGRIO SHER MUHAMMAD, Professor & Director
M.Sc., Ph.D. 2002 (SU)

ARBANI SHAHNAWAZ, Professor Emeritus
M.Sc. (SU), Ph.D. 1973 (Moscow State)

PIRZADA ABDUL JABBAR, Asstt. Professor
M.Sc. (SAL), M.Phil. 2003, Ph.D. (SU) 2008

MEMON RABIA ASMA, Asstt. Professor
M.Sc.(SALU), Ph.D (SALU) 2005

MEMON MAHJABEEN, Asstt. Professor
M.Sc.(SU), M.Phil (SU)

QURESHTI SADAF TABASUM, Asstt. Professor
M.Sc. (S.U), M.Phil. (QAU), Ph.D. (QAU) 2011

ABRO SAEED AKHTER, Asstt. Professor
M.Sc. (SALU), M.Phil. (SALU) 2005

BOZDAR HADI BUX, Asstt. Professor
M.Sc. (QAU), Ph.D. (QAU) 2011

KABIR AMINA, Asstt. Professor
M.Sc. (SALU), Ph.D. (SU) 2011

RAJPUT MUHAMMAD TAHIR, Visiting Professor

HASSANY SYEDA SALEHA, Visiting Professor
M.Phil/MS in Botany: 2-yr, 4-Semester Program (40)

Pre-requisite: Minimum good second class BS/ M.Sc. degree in Botany; Pre-Admission Test.

1st Semester: Core courses:-

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tr>
<td>BOTN 800</td>
<td>Research Methodology (e)</td>
</tr>
<tr>
<td>BOTN 802</td>
<td>Plant Taxonomy (4)</td>
</tr>
<tr>
<td>BOTN 804</td>
<td>Plant Physiology (4)</td>
</tr>
<tr>
<td>BOTN 806</td>
<td>Advanced Genetics (4)</td>
</tr>
</tbody>
</table>

2nd Semester: Optional Subjects (8):

2 courses to be selected from the following and research project will be started.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOTN 808</td>
<td>Paleobotany (4)</td>
</tr>
<tr>
<td>BOTN 810</td>
<td>Phycology (4)</td>
</tr>
<tr>
<td>BOTN 812</td>
<td>Mycology and Environment (4)</td>
</tr>
<tr>
<td>BOTN 814</td>
<td>Palynology (4)</td>
</tr>
<tr>
<td>BOTN 816</td>
<td>Applied Plant Anatomy (4)</td>
</tr>
</tbody>
</table>

2nd to 4th Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOTN 895</td>
<td>Research on approved topic, Thesis and its Defense (16)</td>
</tr>
</tbody>
</table>

BOTN. 800  Research Methodology


BOTN. 802  Plant Taxonomy


BOTN. 804  Plant Physiology

**BOTN. 806**  
**Advance Genetics**


**BOTN. 808**  
**Paleobotany**


**BOTN. 810**  
**Phycology**


**BOTN. 812**  
**Mycology & Environment**


**BOTN. 814**  
**Palynology**


**BOTN. 816**  
**Applied Plant Anatomy**

Introduction to plant structure and development. Epidermis, Wood dendrology, Fossil words, Introduction to tissue culture.
Note: Optional courses will be offered, subject to the availability of qualified staff and a minimum number of 3 candidates.

**Ph.D in Botany : 1-Yr (02-Semester Program: (30 CH Course work)**

Pre-requisite: MS/M.Phil degree in Botany & valid GRE/GAT (Subject) Test result.

**1st Semester:**

**Core Courses**

- BOTN 900 Taxonomy of Angiosperm and Ethnobotany
- BOTN 906 Integrative Paleobotany
- BOTN 912 Phycology

**2nd Semester:**

- BOTN 901 Flowering Plant Systematics
- BOTN 902 Taxonomy, Ethnobotany & Plant Resources
- BOTN 903 Palynology
- BOTN 904 Applied Ecology
- BOTN 905 Integrative Plant Anatomy
- BOTN 907 Evolutionary Paleobotany
- BOTN 908 Medicinal Plants
- BOTN 909 Advances in Molecular Genetics
- BOTN 910 Conservation of Plant Biodiversity
- BOTN 911 Weed Management
- BOTN 913 Phycology (Freshwater Algae)
- BOTN 914 Micromorphology

**BOTN. 900 Taxonomy of Angiosperm and Ethnobotany**

**BOTN. 906: Integrative Paleobotany**


**BOTN. 912 Phycology**


**BOTN. 901 Flowering Plant Systematic**


**BOTN. 902 Taxonomy, Ethonobotany & Plant Resources**

Introduction, Aims and objectives of Paleobotany, Geological timescale, Taphonomy, Necrology, Biostratonomy & Digensis, Necessary conditions for fossilization, Levels of preservation, Types of fossils, Index fossils & use of radio isotope for geological dating, Paleobotany, Paleogeography, Paleoclimatology, Energy resources and organic geochemistry, Evolutionary mechanics.

**BOTN. 903 Palynology**


**BOTN. 904 Applied Ecology**

Introduction to ecological studies, Fundamentals of research in ecology. Field laboratory analysis, Field analysis of community/vegetation. Analysis of species interaction. Analysis of productivity. Field analysis of environmental

BOTN. 905  Integrative Plant Anatomy


BOTN. 907  Evolutionary Paleobotany

Methods of Age dating and the geologic timescale. Origin of the Earth and Life, The Origins of Multicellularity and Multicellular protists. The Cambrian explosion and extinctions. The Ordovician world and mass extinction. The Silurian world, early vascular plants & psilophytes. The lycophytes, the Sphenophytes, the ferns, the progymnosperms, the seed ferns and the Devonian extinction. Coal swamps and glaciers, the carboniferous extinction. The great Permian extinction. The Triassic Extinction. Cycadeoids, Ginkgophytes and other gymnosperms, the Jurassic extinctions. The cretaceous world, the great cretaceous mass extinction.

BOTN. 908  Medicinal Plants


BOTN. 909  Advances in Molecular Genetics


BOTN. 910  Conservation of Plant Biodiversity


**BOTN. 911 Weed Management**


**BOTN. 913 Phycology (Freshwater Algae)**

BOTN. 912  Micromorphology


DEPARTMENT OF FRESH WATER BIOLOGY AND FISHERIES

The department was first conceived as a section of the Department of Zoology. Then in 1973, the Department of Fresh Water Biology & Fisheries was established as an independent department at Allama I.I. Kazi Campus, Jamshoro.

Initially sharing accommodation with Department of Botany, the department shifted to its new building in January 1993. Since then it has further expanded with addition of new labs. and classrooms.

The Department conducts BS, M.Sc. programs and MS/ M.Phil. and Ph.D. degree programs by course studies and research. It has produced three M.Phil and four Ph.D. since its inception and a number of scholars are presently registered for M.Phil. Ph.D. studies. The department has provided well qualified personals in the market for Government and Private Sectors in fisheries and agriculture etc.

The faculty comprises:

NAREJO NAEEM TARIQ, Professor & Chairman
M.Sc. 1987, M.Phil., 1997 (S.U), Ph.D. (Dhaka) 2003

ABBASI ABDUL RASOOL, Professor & Dean
BALOCH WAZIR ALI, Professor

MAHAR MUKHTAR AHMED, Associate Professor (on Lien)
M.Sc. 1995, Ph.D. 2004 (SU)

LASHARI KHALID HUSSAIN, Associate Professor
M.Sc. 1995, M.Phil. 2002, Ph.D. 2009 (SU)

SOOMRO ANILA NAZ, Asstt. Professor
M.Sc. 1998 (SU), MS 2007 (Japan)

BARADI WARANYANI, Lecturer
M.Sc (SU), M.Phil. (K.U) 2008

LAGHARI MUHAMMAD YOUNIS, Lecturer
M.Sc., M.Phil. 2008 (SU)

LAGHARI PUNHAL KHAN, Lecturer
M.Sc., M.Phil. 2008 (SU)

M.Phil/ MS, in Freshwater Biology & Fisheries: 4- Semester Program (40)
Pre-requisite: BS/ M.Sc. in Freshwater Biology & Fisheries, Pre-Entry Test

1st semester
FWBF 800 Advanced Aquaculture-I (4)
FWBF 802 Ecotoxicology (4)
FWBF 804 Advanced Phytoplanktonology (4)
FWBF 806 Lake Management

2nd semester
FWBF 808 Advanced Aquaculture-II (4)
FWBF 810 Research Methodology (4)

2nd to 4th Semester
Ph.D 6 Semester Program: 18 CH Course work Courses under preparation.

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

DEPARTMENT OF MICROBIOLOGY

The Department of Microbiology was established in 1995-96 to develop indigenous manpower experts in the field of Microbiology in order to increase the employability in the field of clinical, industrial, environmental and molecular microbiology. Currently this department is running in its own building since 2008. It offers BS four years program, MS / M.Phil. program and in coming future Ph. D. program with the aims to have graduates high knowledge and research abilities and to promote them in private sectors, government organizations in order to develop the manpower with high technology, to organize interdisciplinary discussions, developing research networks and to facilitate the latest technical information pertaining to the emergence of infectious diseases, laboratory bio-safety and the self preventive measures from the hazardous agents.

Microbiology is an exceptionally broad discipline encompassing specialties. This department has four laboratories for the BS students and one research laboratory for postgraduate program. All equipment and facilities are available to students and researchers. Having a huge space, it possesses six class rooms where 120 students in each can be accommodated, one air-conditioned computer laboratory, two multimedia rooms and a large auditorium and a seminar library. The learning process at the department is a blend of lectures and practical demonstrations, presentations, assignments, group tasks, research projects, study tours, internships in various pathological laboratories, industries etc. independent studies in the departmental seminar library and the use of computers. The efforts have been made by the Department of Microbiology for collaborative research with the co-guidance of various professors and scientists of different universities and research institutions for MS / M.Phil. and Ph.D. program in Microbiology to bridge the gap between the other institutes of region and other provinces in Pakistan in the field of clinical, industrial, molecular biology, genetics and biotechnology and to initiate various research projects. The principal areas of research are.

a- Screening of vancomycin resistant MRSA and its molecular characterization.
b- Isolation, Identification of antibiotic resistance among the gram negative bacteria.
c- Studies on molecular characterization of antibiotic resistant genes and mechanism of resistance development.
d- Physico-chemical analysis of fresh water, river water and industrial sludge and its bioremediation.
e- Characterization of biofilm making gram positive and gram negative bacteria.
f- Microbial production of enzymes and antimicrobial agents.
g- Production of novel antimicrobial compounds from plant extracts.
Production of bioethanol, biodiesel and other organic solvents and probiotics.
Biodegradation of oil and other compounds e.g. pesticides.
Molecular identification of the microorganisms from various clinical specimens.
Use of nanoparticles as antibacterial agent.
Isolation, identification of food fermenting microorganisms from soil.

The faculty comprises:

PATHAN AGHA ASAD NOOR, Associate Professor & Chairman
B.Sc. (Hon.), M.Sc. (SU), M.Phil. (QAU), Ph.D. (SU)

MAKO, GHULAM ASGHER, Professor
B.Sc. (hon.), M.Sc. (SU), M.Phil. (QAU), Ph.D. (SU)

TUNIO SARFRAZ ALI TUNIO, Assistant Professor
B.Sc. (hon.), M.Sc. (SU), Ph.D. (UK)

PATOLI ATIF AHMED, Assistant Professor
B.Sc. (hon.), M.Sc. (SU), Ph.D. (UK)

PATOLI BUSHRA BANO, Assistant Professor
B.Sc. (hon.), M.Sc. (SU), Ph.D. (UK)

MEMON SHAISTA BANO, Assistant Professor
B.Sc. (hon.), M.Sc. (SU), Ph.D. (UK)

FAROUQUI MUNNAZZA SHARIF, Assistant Professor
B.Sc. (hon.), M.Sc. (SU), M.Phil. (QAU)

05 Lecturers

M.Phil in Microbiology: 4-Semester Program (40)
Pre-requisite: BS/M.Sc in relevant discipline & Pre-Entry Test

1st Semester: Core Courses

MICB 700 Advanced Biostatistics

Optional:
### MICB 701
Advances in Food & Fermentation Technology

### MICB 702
Advances in Clinical Microbiology

### MICB 703
Infectious Disease Epidemiology

### MICB 704
Microbial Biotechnology

### MICB 705
Biological Safety and Risk Management

### MICB 706
Immunohaematology and Parasitology

### MICB 707
Plant Microbiology

### MICB 708
Fresh Water Biology

#### 2nd Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>MICB 711</td>
<td>Advanced Biostatistics &amp; Computing</td>
</tr>
<tr>
<td>MICB 712</td>
<td>Molecular Mechanism of Antimicrobial Drugs</td>
</tr>
<tr>
<td>MICB 713</td>
<td>Instrumentation Technology</td>
</tr>
<tr>
<td>MICB 714</td>
<td>Probiotics: Th Live Therapies</td>
</tr>
<tr>
<td>MICB 715</td>
<td>Application of Molecular Biology</td>
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<tr>
<td>MICB 716</td>
<td>Environmental biotechnology</td>
</tr>
<tr>
<td>MICB 717</td>
<td>Techniques in Biological Research</td>
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<tr>
<td>MICB 718</td>
<td>Clinical Laboratory Technology</td>
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<tr>
<td>MICB 719</td>
<td>Agrobiology</td>
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</table>

#### 3rd & 4th Semester

Research Project & Thesis (16)

### Ph.D in Microbiology:

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>MICB 800</td>
<td>Research Planning &amp; Report Writing</td>
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</tbody>
</table>
MICB 801  Bacteriocin and Bacteriophages
MICB 802  Genomics and Bioinformatics
MICB 803  Environmental Science and Management
MICB 804  Advances in Immunotherapeutics
MICB 805  Applied Biotechnology
MICB 807  Molecular Basis of Mycotic Infections
MICB 809  Molecular Genetics
MICB 810  Infectious Diseases, Management and Safe Practices
MICB 811  Departmental Seminar
Physiology Department was established by University of Sindh in 1974. Professor Dr. Abdul Qadir Ansari, was the founder chairman of the department. This department has very significant role in the advanced age of applied biological and health sciences. Physiology Department University of Sindh Jamshoro is the second one outside medical colleges/universities in Pakistan. It is introducing teaching and research programs in basic, experimental and applied physiology, at undergraduate and graduate levels. Healthy atmosphere, committed working, highly qualified teaching faculty, well equipped computer added experimental/ research laboratories and seminar library with digital library system are main symbols of entity of the Physiology department. This department objectively play significant role in the advancement of physiological sciences, with a variety of vigorous research programs supporting undergraduate physiology education and graduate studies in relevant fields. Science past many years Physiology department produced a good number of B.Sc. (Hons.), B.Sc (Pass), M.Sc., BS(4-years) and Ph.Ds programs with special interests in the fields of Molecular Biology, Endocrinology, Neurophysiology, Pharmacology & Toxicology, Haematology, Histo & Patho-Physiology and Reproductive Physiology.

The faculty comprises:

SOOMRO ALI MUHAMMAD, Professor & Chairman
M.Sc. (Physiology) 1984(S.U), Ph.D (S.U) 2006

MAHESAR HIDAYATULLAH, Asstt. Professor
M.Sc. 1984, Ph.D 2009 (S.U)

JOKHIO RUKHSANA, Asstt. Professor

LEGHARI ZULFIQAR ALI, Asstt. Professor
M.Sc. (S.U) 1997, Ph.D (Nottingham) 2011

06 Assistant Professor & 05 Lecturers

M.Phil in Physiology: 4-Semester Program (40)
Pre-requisite: BS/M.Sc in relevant discipline & Pre-Entry Test

1st Semester

PHSL-800 Research Methodology (Compulsory)(4)
PHSL-802 Clinical Haematology (Optional-I) (4)
PHSL-804 General Pharmacology (Optional-II) (4)
PHSL-806 Research Reading- (Compulsory) (4)
PHSL-808 Advanced Endocrinology (Optional-III) (4)

2nd Semester
PHSL-810 General Renal Pharmacology (Optional-IV) (4)
PHSL-812 Advanced Physiology of Nutrition (Optional-V) (4)
PHSL-814 Advanced Reproductive Endocrinology (Optional-VI) (4)
PHSL-816 Endocrinology and metabolism (Optional-VII) (4)
PHSL-818 Pharmacology & Toxicology (Optional-VIII) (4)
PHSL-820 Autonomic and Autacoids Physiology (Optional-IX) (4)

2nd to 4th Semester
PHSL-895 Research on approved topic,
Thesis and its Defense (16)

Note: MS./M.Phil student will have to take 02 optional subjects each in 1st and 2nd semesters respectively.

PHSL:800 Research Methodology (General)

Demonstration about Principles of Research-Lab, Class Instrumentations, Method of Sterilization, Issuing and labeling, Organization, Preparation of Reagents, Sampling and its types.


Biostatistics and computation, data analysis, completely randomized design (CRD) randomized block design, analysis of varience, single and multiple factor, multiple comparisons and Duncans New Multiple Range Test (DNMRT) Linear regression and correlation, significance of regression, correlation coefficient and comparison. Application of "T" and Chi- square test. Use of computer for research studies. Collection, preservation and transportation of samples and laboratory analysis. Preparation of questionnaire. Statistical computing using Packages: Working Manipulation, Lotus – 123 Excel Statistical Data Analysis, SPSS.

PHSL:802 Clinical Haematology

Disorders of RBC (Erythrocytes), Abnormalities of RBC (Erythrocytes), Red cell morphology: Size colour, shape, red cell inclusions, Disorder of red cell production & maturation (Dyserythropoieses), Myeloproliferative disorders (erythrocytosis), Polycythemia-vera, Secondary polycytemia, Anaemias: Classification of anaemias.
Types of anaemias, Aplasia & hypoplasia (Aplastic anaemias) Stromal Disease: Disorders of marrow micro-environment. Anaemias of chronic disorders: Megaloblastic anaemias I, & II, Folate (Folate-metabolism), Pernicious anaemias, folic acid deficiency (iron deficiency), Gastric carcinoma in pernicious anaemia's, Megaloblastic anaemias following gastrectomy, associated with fish tape worm infestation, and with disorders of small intestine, Idiopathic statorrheoea and cholic disease, Nutritional megaloblastic anaemia.


PHSL:804   General Pharmacology

Demonstration / Instructions for Lab- use (to guide the students about the basic concepts & sensitivities of Research work). Operating the Instruments, Maintenance, Reagents preparation & Keeping. Hazards of Chemicals/ Reagents, apparatus & handling of all (especially, required for your own work). Physiological solutions, Buffers, pH-maintenance, preparations & its importance. Use of manual electrical, electronic (Digital) – Balances, pH-meter, with the knowledge of percent/ Molar/ Molal/ Normal solution preparation. Practices, especially on those equipments, very basic/ specific to your own piece of work. Use of ovens, Distillers and autoclaving, shaking-water baths, etc. with use of De-ionizer. Demonstration about data-statistics graphing (types & principles), all measurements related our experiments with calibration & standard, Curve graphing (known/ unknown).

PHSL:806   Research Reading

Research Survey, Use of Library (Research Journals), research papers (reports) & use of internet.

PHSL:808   Advanced Endocrinology

Recent advances in neuroendocrine control of spermatogenesis, puberty and obesity. Review of the hormonal control mechanisms involved in regulating reproduction, growth, and homeostatic systems within animals. Mechanism of action, receptor characteristics, hypothalamic control of the pituitary gland, hormonal regulation of water balance, reproduction, stress responses, metabolism, and calcium balance. A comparative approach of the endocrine system functions in non-mammalian vertebrates. Evolution of specific systems. Studies on recently discovered hormones.

PHSL:810   General Renal Pharmacology

Introductions General Pharmacology, Pharmacokinetics, Pharmacodynamics, Signaling Mechanisms, Receptor, Desensitization. Dose and Drug Response, Variations & Curves, Clearance of Normal Urinary Wastes, clearance of

Demonstration about various methods for sample collection, preservation and Observations of urine. To study the Physical and chemical properties of Urine (as a basic/Routine test). Examination techniques for Glucose, Iron, Vit-C. Uric acid and Proteins, etc. To observe the effects of Diuretics on Urinary volume. Body weight. PH-leave. Flamephotometric Determinations of various Electrolytes, i-e specially sodium potassium and calcium in Urine (Normal/Control). To observe the effects of Diuretics (Lasix/ Frusemide) on the Na+, K++ and Ca²⁺ levels. To observe the effects of Diuretics on Blood pressure+ Pulses.

**PHSL:812 Advanced Physiology of Nutrition**


Laboratory aids in diagnosis of malnutrition. Clinical surveys, preparation of sample (serum, skin, tissue, hair and nails) for different analyzing purposes.

Physical examination, Anthropometry.


**PHSL:814 Advanced Reproductive Endocrinology**


**PHSL:816 Endocrinology and metabolism**

Endocrine physiology, Concepts in Endocrine Pathophysiology, Tools used in endocrine research, Hormones and Mechanism of Hormone Action, Endocrinol. Metabolism: The Thyroid and Pancreas (blood sugar), Endocrinology of Metabolism, Pancreas and Growth; Obesity and the Science of Eating, Diabetes Mellitus & Obesity, obesity and adipocyte-derived hormones, Dyslipidemia, Obesity – Advances in Concepts and Therapies, Molecular genetics and pathogenesis of diabetes, diabetic complications; Molecular genetics and pathogenesis of atherosclerosis, clinical
studies on growth hormone excess and deficiency; pathogenesis and management of autoimmune thyroid disease, Regulation of Calcium, Metabolic Bone Disease, Osteoporosis and Vitamin D Deficiency, Endocrine Hypertension, genetics and environmental determinants of osteoporosis; linkage analysis of low bone mass.

PHSL:818 Pharmacology & Toxicology

Molecular Mechanism of Drug Action: Binding forces in drug receptor interactions, structure activity relationship and the conformation of the receptor surface, application of computational chemistry in drug receptor action, consequences of drug receptor interaction, analysis of graded dose response relationship, drug actions that are not mediated directly by the receptor. Pharmacological studies on various groups of Drugs

Cardiovascular pharmacology, Vasodilators: Nitric oxide - Biosynthesis of nitric oxide and its control, Degradation and carriage of nitric oxide, Effects of nitric oxide, Therapeutic use of nitric oxide and nitric oxide donors, Inhibition of nitric oxide, Clinical conditions in which nitric oxide may play a part. Ion channels, exchangers and pumps: Transduction mechanisms as targets of drug action, voltage sensitive ion channels—structure and function, K+ channels. Voltage sensitive Ca+2 channels and the pharmacology of their inhibitors. Agonists at b-adrenoceptors. Pharmacology of Na+/K+ ATPase and gap junctions.


PHSL:820 Autonomic and Autacoids Physiology


PHSL: 895 Research on approved topic, Thesis and its Defense

DEPARTMENT OF STATISTICS

The Department started functioning in 1964 and within three years, it became a full-fledged department. In 1972, it was merged with the Department of Mathematics. In July 1978 it was separated again. Since then, it has been working as an independent department, offering 4-year BS. (Stat), M.Sc. and Diploma programs. The M.Phil/ Ph.D. programs have been introduced from the 2002 session and presently seven Research students are working for research degrees. The department has well equipped Computer Laboratories and senior qualified and trained faculty. The importance of Statistics is growing day by day in every field of life and there is increasing demand for trained and qualified personnel.

There are numerous public and private organizations in Pakistan where qualified manpower in Statistics is needed. The job opportunities are available at Government level in the Statistics Division and its four departments, i.e., Federal Bureau of Statistics, Population Census Organization, Agricultural Census Organization, Pakistan Institute of Training and Research, Bureau of Statistics and other organizations at provincial level. A number of Research Papers on different Statistical topics have been published by the faculty in National and International Journals. In addition, twelve(12) Research Scholar are enrolled for M.Phil. program and two (02) are pursuing Ph.D. studies in Statistics.
The faculty comprises:

TALPUR GHULAM HYDER, Professor & Chairperson
M.Sc.(S.U) 1986, Ph.D.(Shanghai Sc. & Tech. Univ.) 1994
Post Doctorate (Ball State University, U.S.A) 2007

SHAH SYED MEHBOOB ALI, Visiting Scholar
M.Sc. (S.U) 1974, Ph.D. (Bukharest) 1980

RAJPUT RAJA MUHAMMAD ILYAS, Visiting Scholar
M.Sc. 1975, LL.B. 1975, Ph.D. 2008 (S.U)

01 Associate Professor, 05 Assistant Professors, 01 Lecturer,

**M.Phil./MS. Program in Statistics: 04-Semester Program (40)**

Pre-requisite: BS/M.Sc in relevant discipline & Pre-Entry Test

In M.Phil Program there will be 24 C.H Course Work, 06 Courses of 04 C.H each in Two Semesters. During two semesters of teaching in M.Phil./MS. Statistics. Two compulsory and two optional courses will be taught in First Semester and two optional in Second Semester from the following list of courses.

**1st Semester (Compulsory Courses)**

- STAT 800 Research Methodology & Computer Applications(4)
- STAT 802 Advance Theory of Statistics(4)

**Optional Courses** Two courses to be offered amongst the followings:-

- STAT 804 Applied Demography(4)
- STAT 806 Experimental Designs(4)
- STAT 808 Topics in Survey Sampling(4)
- STAT 810 Advance Econometrics(4)

**Note:** The course as listed under optional will be offered, subject to the availability of qualified staff and facilities.
2nd Semester (Optional Courses) Two courses to be offered amongst the followings:-

- STAT 812 Operations Research (4)
- STAT 814 Statistical Inference & Decision Analysis (4)
- STAT 816 Linear Models & Non Linear Models (4)
- STAT 818 Multivariate Analysis (4)

Note: The course as listed under optional will be offered, subject to the availability of qualified staff and facilities.

3rd & 4th Semester

- STAT 895 Research Thesis & its Defence (16)

STAT 800 Research Methodology

This course familiarize with research techniques it trains in preparing questionnaires, collecting data and evaluating implementation and delimitation, focusing on techniques to data collection and analysis other than formal surveys and advantages and limitations of different research method.

STAT 802 Advance Theory of Statistics


STAT 804 Applied Demography

Introduction: Population without age, The Life Table, Mortality Comparisons: the Male-Female Ratio, Fixed Regime of Mortality and Fertility: The use of stable Theory, Birth and the Intrinsic Rate of Natural increase, Reproductive Value, with Applications to Migration, Contraception, and Zero Population Growth and Understanding Population Characteristics:

STAT 806 Experimental Designs

Introduction to experimental design and their analysis: Experiments with a single factor, Latin square designs, Split plot designs. Factorial designs, Confounding, Fractional factorials, Incomplete block designs, the existence and construction of balanced incomplete block designs, Response surfaces.
STAT 808   Topics in Survey Sampling

(i) Non-Sampling Error:-


STAT 810   Advanced Econometrics

(i) Econometrics:-

Introduction, Relation among economic variables, Stochastic linear regression model, Error in variables,


STAT 812   Operations Research

1. Review of Probability Theory:-


STAT 814   Statistical Inference & Decision Analysis


STAT 816   Linear Models & Non Linear Models (Optional)


STAT 818   Multivariate Analysis (Optional)

Multivariate Normal distribution, Hotelling’s T distribution, Hypothesis tests for means and covariance’s, the Wishart distribution, Principal component, Factor Analysis, Cluster Analysis, Canonical Correlation analysis, Discriminant analysis, Multi dimensional scaling, Multivariate Regression Analysis, Multivariate analysis of variance.
Ph.D in Statistics: 6 Semester Program: (18 CH Course work)

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

1st Semester

STAT 900  Research Methodology (3)
STAT 902  Statistical Computing by using Statistical Packages (3)

Optional Courses: One course to be offered from the followings:-

STAT 904  Statistical Models and Simulation (3)
STAT 906  Survival Analysis (3)

2nd Semester

STAT. 908  Theory of Validity & Reliability (3)

Optional Courses: Two courses to be offered from the followings:-

STAT 910  Applications of Operations Research in Research Problems/Projects (3)
STAT 912  The Study of Populations and their Analysis (3)
STAT 914  Advance Theory of Stochastic Process(3)

Note: Optional course will be offered, subject to the availability of qualified faculty.

STAT 900  Research Methodology

Philosophy and Ethics of Research, Selection of Problem, Formation of Hypothesis and procedure for its Testing, Research Methodology, Interpretation of Results, Components of Scientific Reports and Various Methods of Data Presentation, Preparation of Scientific Reports, Thesis writing, Publication Procedures.
STAT 902  Statistical Computing by Using Statistical Packages

Qualitatively and Quantitative data presentation and analyzing data in Minitab. Introduction of SPSS, data manipulation in SPSS, Analysis using SPSS syntax programming. (Use of SPSSs, Minitab, Matlab, Satistica is based upon the availability of Software).

STAT 904  Statistical Modeling and Simulation


STAT 906  Survival Analysis

Special features of Survival data. Time dependent and censored survival data. Stratified and log rank tests for trend. Modeling of Survival data; Exploratory data analysis and other models. Sample size requirement for survival study.

STAT 908  Theory of Validity & Reliability

Structural reliability, Lifetime distributions (Failure models); Point and interval estimation. Fatigue life model. Testing reliability hypothesis. Monte Carlo, distribution free and Bayes’ methods in reliability. Inferences for these models. Accelerated life testing.

STAT 910  Applications of Operations Research in Research Problems/Projects


STAT 912  The Study of Populations and their Analysis


STAT 914  Advance Theory of Stochastic Process
DEPARTMENT OF ZOOLOGY

The Department was established in 1956. It was shifted at the Allama I.I. Kazi Campus, Jamshoro in 1961 and to its present premises in 1965. Two of its new laboratories were constructed in 1993 and were named after the former Chairman, Late Prof. S. Ishfaq Hussain Shah who died of heart failure on August 27, 1991.

Since its inception, the department had been imparting instructions for the 3-year B.Sc. (Hons.) courses and one/two year M.Sc. degree programs. 4-yr BS Program has been introduced since 2003. It has been disseminating specialized knowledge in the five fields of Entomology, Parasitology, Vertebrate Biology, Endocrinology and Genetics. The Department also offers programs leading to M.Phil and Ph.D degrees in these specialized fields. It has produced 16 Ph.Ds. and 40 M.Phil. since its inception. Present enrolment in the Department is 700 including M.Phil/Ph.D. students.

Currently two research projects are running under the Principal Investigation of Dr. Riffat Sultana funded by PSF and HEC.

The department has been progressing steadily and at present it is the second largest department in the Faculty of Natural Sciences University of Sindh.

The faculty:-

Presently the faculty comprises 04 Professors, 02 Associate Professors, 08 Assistant Professors and 4 Lecturers.
MEMON NASREEN, Professor & Chairperson
M.Sc. (S.U) 1985, Ph.D. (Kar.) 2002

SOOMRO NAHEED SULTANA, Professor
M.Sc. 1976, Ph.D. 2001 (S.U)

SHAIKH AZRA ANJUM, Professor
M.Sc. (S.U) 1975 & M.S. (Tuskegee) 1985, Ph.D. (SU) 2004

GACHAL GHULAM SARWAR, Professor

KAKA NAHEED, Assoc: Professor

TAHIRA JABEEN, Asstt: Professor
M.Sc. (S.U) 1989; M.Phil. (SU) 1998

RIFFAT SULTANA, Asstt. Professor
M.Sc(SU) 2003, Ph.D (S.U) 2008

SINDHI MEHTAB, Asstt. Professor
M.Sc. (S.U) 1992, M.Phil. 2000 (Q.A.U)

BHUGHIO BARKAT ALI, Lecturer
M.Sc (S.U)1993, Ph.D (S.U) 2012

01- Associate Professor, 05 Assistant Professors & 03 Lecturer

M.Phil./MS. Program in Zoology : 04-Semester Program (24)
Pre-requisite: BS/M.Sc in relevant discipline & Pre-Entry Test

1st Semester
Zool.800 Research Methodology (4)
Zool.801 Biostatistics (4)
Zool.802 Elective Papers-I / Specialized course –I (4)
Zool.803 Elective Papers-II/ Specialized course –II (4)

2nd Semester
Zool.804 Pollution (4)
Zool.805 Advances in Developmental Biology (4)

3rd & Forth Semester
Research & Thesis

ZOOL.800 RESEARCH METHODOLOGY (4)
Introduction to the research process, Sampling, objectives and techniques, data collection professing and analysis
Presentation of research result.

ZOOL. 801 BIOSTATISTICS (4)
Introduction and Scope of Statistics in Biology; Sampling; Stages of Research, formation of tables and charts. Measures of central tendency computation of mean, media and mode from grouped and ungrouped data., standard deviation, standard error and their coefficients. Probability rules. Binomial, poison and normal distributions. Hypothesis testing, students; ‘t’ test, Chi square test, Analysis of variance and LSD, Correlation and regression. Experimental designing, planning of an experiment, replication and randomization.

ZOOL. 802 Entomology-I Insect Taxonomy and Ecology (4)
Taxonomic categories and concepts, Taxonomic procedure, zoological nomenclature, Mating behavior, Comparative study of insect according to their habitats, Insect competition and social behavior, Population under insecticidal stress

ZOOL. 803 Entomology-II Applied Entomology (4)
Pest of crop and their management, Plant resistance to insect, pesticide Toxicology, Control mcaswer of pest of crops

ZOOL. 802 Parasitology I (General Parasitology) (4)
Introduction of parasitology, Principles of parasitology, Basic terminology, Host parasite relationship, Effects of parasites on host, Types of parasitism, Parasitic life cycle, Biology, pathology and control of parasitic protozoa with particular reference to protozoa of medical and veterinary importance, Morphology, life-cycle, diagnosis and control of the species of following general protozoa: Trypanosoma, leishmania, Trichomonas, Giardia, Entamoeba, Eimeria, Toxoplasma, Plasmodium, Haemoproteus and babesia.

ZOOL. 803 Parasitology II (Helminthology and Vector Biology) (4)
Morphology, Pathology, Life cycle and diagnosis and control of the helminthes of medical and veterinary importance, Morphology, life cycle of the Vector causing disease of those responsible of or transmission of disease. Chemical and Non-Chemical control of vectors of medical and veterinary importance.

ZOOL. 802 Vertebrate Biology-Paper-I (Introduction to Ornithology) (4)
Meaning and definition of ornithology, Historical background of ornithology, Scope and aims of ornithology

Flight mechanism in birds: Special, Special internal organs for flight, Wings and their feather shape, Tail feather, Ways/ kinds of flight, Flapping or beating wings, Gliding, Fluttering

Sense in birds: Vision, Monocular, Binocular, Plumage in birds, Breeding & Parental care in birds, Birds migration / Geographical distribution and migratory

ZOOL. 803 Vertebrate Biology-II A. An Introduction to Mammology (4)
Rational of mammology, Aspects of research in mammology, Journals of mammology


b. Population Forces: Natality (birth rate, reproductive rate, breeding rate, breeding season and density): Mortality rate (factor affecting mortality, migrality, dispersal, homing), Metabolism of population, Metabolism of population (energy dynamics and mineral cycles)

c. Activities and behavior: Diurnal and nocturnal Activity, Food, Home range, Social behavior, Communication, Care of young’s, Learning.

B. Wild life Mangement and Conservation

a. Wild life managements and its problems

What is wild life management? Historical Back ground of wild life management.

b. Objectives of wild life management

Conservation of renewable resources, Man’s influence of natural resources.

ZOOL. 802 Endocrinology-I General and Comparative Endocrinology (4)
General concepts and principles of chemical coordination, The details of the endocrine mechanisms in relation to various functions such as reproduction and lactation. Recent trends of endocrinology in relation to diversified function. Comparative studies of endocrine mechanisms in various invertebrates and verebrates.
An overview of general concepts and principles of endocrinology: The endocrine system; Type of hormones.

Hypothalamus and pituitary: Hypothalamic hormones: Origin, chemistry and actions. Thyroid gland: Anatomy and histology of gland; Formation and secretion of thyroid hormones; Thyroid hormones in peripheral tissues, Regulation and factors affecting thyroid function. Calcitrophic and Mineral Metabolism Hormones: Pancreatic hormones and Regulatory Peptides of the Gut


ZOOL. 803 Endocrinology-II Molecular and Clinical Endocrinology (4)

To study that degenerate disease are the results of alterations in biochemical homeostasis regulated by endocrine system, Mainfestation of degeneration diseases at molecular level.

General Mechanisms in Molecular Endocrinology, Mechanisms of Action of Hormones, Functional Pathology in Endocrine Glands, Fuel Homeostasis: Glucose Homeostasis and Hypoglycemia: Diabetes mellitus; Disorders of Lipoprotein metabolism; Eating Disorders: Obesity, anoxia nervosa and bulimia nervosa, Development and Growth: Disorders of growth and puberty, Endocrine Hypertension, Polyendocrine syndromes, Hormones and Cancers: Geriatric Endocrinology: endocrine and associated metabolism in aging: Specifically thyroid, glucose calcium homeostasis.Studies on recognition and response of receptors; Studies of disorders of pituitary by observing anatomical and histological features; Studies of thyroid status in deficient and excess hormone functions, studies of ype 1 and type 2 diabetes mellitus: Epidemiology of the types in population, studies of management of the type 2; Model, Studies of disorders of Ovarian and Testicular disorders; Model studies of obesity and aneroxia; Studies of hormonal status in puberty and aging.

ZOOL. 804 POLLUTION (4 )

Pollution: Introduction and Definition. Land Pollution: Deforestation; trash and solid waste; pesticides and fertilizers; mining; nuclear power, coal and synthetic fuels; heavy metals. Land pollution control: landfills; '3 R' (Reduce, Reuse and Recycle) idea; re-vegetation.

Air-pollution: factors that contribute to air-pollution, Water Pollution: Kinds of water-pollution, pollution of fresh-water, sewage and organic material and oxygen depletion, toxic and radioactive substances, suspended sediment and dissolved solids.


ZOOL. 805 ADVANCES IN DEVELOPMENTAL BIOLOGY (4)
Current topics related to developmental biology and experimental embryology; assembly of cells, tissues and their interaction; studies on regulation in mammals and nonmammalian vertebrates; Morphogen Gradients in Development, their molecular mechanism; mosaicism; paracrine factors. Apoptosis; Medical implications of Developmental Biology, environmental regulation of development; stem cells and gene therapy.

**Ph.D in Zoology: 6 Semester Program: (18 CH Course work)**

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

**1st Semester**

- Zool. 900  Pest Management (4)
- Zool. 901  Medical Entomology (4)
- Zool. 902  Physiological Basis of Behavior(4)
- Zool. 903  Hematology(4)
- Zool. 904  Seminar(2)

**ZOOL.900  PEST MANAGEMENT (4)**

Introduction of pest, Methods: study pest populations; damage assessments. Collection, mounting studying and identification of important animal pests. Endo and ecto-parasite of various animals.; Mounting of slides after processing the parasites. Collection, preservation and identification of insects up to families, Identification of damage to crops by different vertebrate pest

Disease carriers and public health importance. Control: Habitat manipulation and ecologically based integrated management

Laboratory and field evaluation of pesticides and bait materials, Evaluation of control. Justification and ecological consideration.

Role of insects, helminthes, nematodes, protozoans and other pathogens in disease Biology and ecology of common avian and mammalian pests of Pakistan Concept of economic levels, economic damage and economic boundary, economic injury level and economic threshold. Household pests and their management.

**ZOOL.901  MEDICAL ENTOMOLOGY (4)**

Introduction to arthropods, Identification and characterization of insects injurious to man; Insects of medical importance: TseTse fly; Mosquito, Bugs etc, Ticks and disease: Relapsing fever, spotted fever, tick typhus, Q fever, Texas fever, control of ticks.

ZOOLOGICAL BASIS OF BEHAVIOR (4)

Behavioural mechanisms; advancement in the large and small animal behaviours: aggression; feeding; sexual behaviours; motivational behaviours; sensation and perception; Evolution of brain and behaviour; Hormonal influence on behaviour; Sexual behaviours and mating systems; Internal regulation; Biological rhythms; sleep and dreaming; Emotions; aggression and stress; Biological basis of behavioral disorders; Learning and memory; Language and cognition; Perception and actions; Psychopharmacology; motor systems.; Pain and stress; drug abuse

HEMATOLOGY (4)

Blood and its composition; plasmas and serum proteins; study of erythrocytes, leukocytes and platelets at cellular and molecular level. Hematopoiesis; Anemias and hemoglobin disorders. Study of Leukemias. Familial blood diseases; Collection and handling of blood; References ranges and normal values; Basic hematological techniques; Preparation and staining of blood films; Blood cell morphology in health and disease; Study of different anemias; Investigation of coagulants, anticoagulants and study of blood platelets; Blood cell antigens and antibodies; Molecular techniques.

SEMINAR (2)

PhD students will be assigned topics on respective specializations. The students will write a review paper (based on latest publications) and deliver a comprehensive seminar on the topic.
FACULTY OF PHARMACY

The Department of Pharmacy initially established in 1974, was upgraded to the Institute of Pharmacy in 1999 and finally became Faculty on 2nd May 2005. Earlier, it offered courses leading to the degree of B. Pharmacy (4-year courses). However as of 2004 session, nomenclature of the degree has been changed to Doctor of Pharmacy (Pharm D) and it has been made five years (10-semester) degree course. The Faculty also offers M.Phil/Ph.D. in the fields of Pharmaceutics, Pharmaceutical Chemistry, Pharmacology and Pharmacognosy, while Pharm-D degree is offered jointly by the four component departments. The faculty comprises skilled professionals.

The Faculty has to date produced about 1200 Pharmacists out of which more than 99% are working in different organizations of National and International repute. At present the Faculty has on its roll 1006 local students in both Morning & Evening batches including about 128 (Male & Female) students from more than 12 different countries, that gives a cosmopolitan look.

PROF. DR. ABDULLAH DAYO
Dean

DEPARTMENT OF PHARMACEUTICS

The Department was established in May 2005 with the up-gradation of the Institute of Pharmacy to ‘Faculty of Pharmacy’. Prof. Dr. Abdullah Dayo was appointed as the first Chairman of the Department.

The faculty comprises:-
ALMANI KHALIDA FARYAL, Professor & Chairperson
B.Pharm 1987 (S.U), M.Pharm. 1991, Ph.D. 2004 (S.U)
DAYO ABDULLAH, Professor & Dean
MUGHAL UBED-UR-REHMAN, Asstt. Professor
B.Pharm. 1998 (S.U), M.Phil 2009 (S.U)
GHOTO MUHAMMAD ALI, Lecturer
B.Pharm 1999, MBA, 2005, M.A 2007(S.U), Ph.D 2013 (S.U)
01 Asstt. Professor and 02 Lecturers

M.Phil in Pharmaceutics: 4-Semester Program (40)
Pre-requisite: BS/M.Sc in relevant discipline & Pre-Entry Test

1st Semester
<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>PHCS 800</td>
<td>Biostatistics (4)</td>
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<tr>
<td>PHCS 802</td>
<td>Advanced Pharmaceutics (4)</td>
</tr>
<tr>
<td>PHCS 804</td>
<td>Biopharmaceutics (4)</td>
</tr>
<tr>
<td>PHCS 806</td>
<td>Pharmaceutical Microbiology (4)</td>
</tr>
</tbody>
</table>
2nd Semester

PHCS 808  Pharmaceutical Technology (4)
PHCS 810  Clinical Pharmacy (4)

2nd to 4th Semester

PHCS 895  Research on approved topic, Thesis and its Defense (16)

PHCS 800  BIOSTATISTICS

PHCS 802  ADVANCED PHARMACEUTICS
Surfactants and their applications in Pharmaceutical Dosage Forms; as Solubilizers, Specialized Pharmaceutical Emulsions, Novel Drug Delivery System, Micro Encapsulation/ Methods of Particles coating, Cosmetics and their quality control, Transdermal drug delivery system.

PHCS 804  BIOPHARMACEUTICS

PHCS 806  PHARMACEUTICAL MICROBIOLOGY
Microbial Enzymes: Classification and mechanism of Action, Commercial production application, Immobilized Enzymes, General Principles and methods of Microbiological assays. Microbial spoilage and preservation of pharmacetical products, Fundamentals of Genetic Engineering and its application in Medicine, Principles, synthesis and applications of Monoclonal antibodies.

PHCS 808  PHARMACEUTICAL TECHNOLOGY

PHCS 810  CLINICAL PHARMACY
Latest development and advances in clinical Pharmacy, Patient Communication, Surgical Supplies, Total Parenteral Nutrition. Problem Oriented Approach: Cardiovascular Disorders, Infectious diseases, Renal disease, Respiratory Diseases, Specific Poisons and drugs: Diagnosis and treatment, Anti-biotics, Antidepressants, Arsenic, Nitroglycerin and Cyanide, Pharmacy Administration.

DEPARTMENT OF PHARMACOLOGY

The Department of Pharmacology was established in May 2005 when the Institute of Pharmacy was upgraded to ‘Faculty of Pharmacy’. Although it is a new department, the scope of the subject plays an important role in the career planning of pharmacists. The department offers courses covering a whole range of subjects which deal with the human body, Anatomy, Physiology, Histology, Pathology, Basic Pharmacology, Systemic Pharmacology, Toxicology etc., to monitor and control the effects of medication. On graduate level, it has recently updated its syllabus by incorporating advanced courses on Neuropharmacology, Chemotherapy, Endocrinology and Drug Bioscreening. Pharmacology shares the basic medical sciences as an integral part of the Faculty of Pharmacy.

Presently 8 candidates are pursuing research studies for M.Phil. degree.

The faculty comprises:
BHAHTI ABDUL RAHIM, Asstt. Professor and Incharge Chairman
B.Pharm. (S.U) 1980, M.Phil. (B.Z.U) 1991
KAHI HAMID ALI, Lecturer  
B.Pharm. 2000, Ph.D 2011(China)

1 Asstt. Professor and 02 Lecturers

M.Phil. in Pharmacology: 4- Semester Program (40)
Pre-requisite: B.Pharm. degree with good second division score, Pre-Entry Test

1st Semester

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>PHGY 800</td>
<td>Advance Biostatistics (4)</td>
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<tr>
<td>PHGY 802</td>
<td>Advance Pharmacology (4)</td>
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<tr>
<td>PHGY 804</td>
<td>Chemotherapy &amp; Neuropharmacology (4)</td>
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<tr>
<td>PHGY 806</td>
<td>Cardiovascular Pharmacology (4)</td>
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2nd Semester

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<th>Course Code</th>
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<tbody>
<tr>
<td>PHGY 808</td>
<td>Endocrinology (4)</td>
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<tr>
<td>PHGY 810</td>
<td>Drug Bioscreening (4)</td>
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2nd to 4th Semester

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<th>Course Code</th>
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<tr>
<td>PHGY 895</td>
<td>Research study on approved topic. Thesis and its Defense (16)</td>
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PHGY 800  BIOSTATISTICS
The course is in common with Biostatistics offered in M.Phil. Pharmaceutics.

PHGY 802  ADVANCE PHARMACOLOGY
General Pharmacology, Pharmacokinetics, Pharmacodynamics, Screening and Standardization, Pharmacogenetics,
Toxicity Testing, Drug Reaction and Interactions, hypersensitivity, Mutagenecity, Teratogenicity, Carcinogenicity,
Autonomic Nervous system and related Drugs. Fundamentals of Clinical toxicology and poison prevention, Acute
poisoning, divisions of toxicology, specific toxicants. Biochemical and Molecular Pharmacology; Transcription and
Translation of Genes, Neurohumoral Transmission and Signal Transduction, Eicosanoids, Anti-histamines, Anti-gout,
Corticosteroids and Immunomodulators.

PHGY 804  CHEMOTHERAPY & NEUROPHARMACOLOGY
Chemotherapy; Antibacterials, Antifungals, Antivirals, Antiprotozoals, Anthelmints and Anticancers. Antineoplastic
Drugs, Pathology, Type and behaviour of neoplastic growth, drug used as cancer therapy. Some neoplastic disorders
and their treatment, radiations, assessment of drug response. Neuropsychopharmacology; Drug Abuse, CNS
Stimulants, Depressants, etc., anti-Parkinsonians, Anti-Epileptics, General and local Anaesthetics. Anti-Microbial
drugs, Bacterial and fungal cell culture isolation, Immunology, Vaccines, Sera, Toxins, Prevention and Treatment of
Diseases, e.g., TB, Leprosy, Malaria, Amoebiasis.

PHGY 806  CARDIOVASCULAR PHARMACOLOGY
Pathophysiology of Cardiovascular Drugs, Hypertension, Regulation, Postural Baroreflex, hypertensive emergencies,
hypotension, Congestive heart Failure, Hyperlipidemia, Hyperlipoproteinemia, Anti-hypertensive Drugs, Classification
and Site of action of drugs in both. Mechanism, Pharmacological Effects, Vasodilators, ACE inhibitors, Angina
pectoris, Pathophysiology, Determination of myocardial oxygen demand. Coronary blood Flow and myocardial O2
supply. Drugs. Arrhythmias, Mechanism of initiation, Classification, interpretations of different kinds of arrhythmias,
Myocardial infarction.

PHGY 808  ENDOCRINOLOGY
Thyroid Hormones, Synthesis, Actions and therapeutic uses. Drugs and inhibitors. Mechanism of action, therapeutic
uses, ionic inhibitors, Radioactive iodine. Physiology and Pharmacological actions, mechanism of actions,
preparations, untoward responses and therapeutic uses of estrogens and progestins. Anti-estrogens. Adenohypophyseal and related hormones. Therapeutic uses, regulations, Adenocorticotropic hormones. Regulation of
secretion, therapeutic and diagnostic application, Insulin and hypoglycemic drugs.

PHGY 810  DRUG BIOSCREENING
Fundamentals and scope of drugs screening, in vitro methods on isolated tissue, in vivo methods; screening of drug
and their metabolites in biological fluids, instrumental methods, thin layer chromatograph, gas chromatography,
spectroscopic methods, high performance liquid chromatography, problems of drug screening.
DEPARTMENT OF PHARMACEUTICAL CHEMISTRY

The Department was established in May 2005 with the up-graduation of Institute of Pharmacy to Faculty of Pharmacy. Prof. Dr. Muhammad Usman Memon was the first Chairman of the Department.

The faculty comprises:

LEGHARI MUHAMMAD YOUSIF, Assoc. Professor & Chairman

1 Asstt. Professor and 1 Lecturer

M.Phil. in Pharmaceutical Chemistry: 4- Semester Program (40)
Pre-requisite: B.Pharm. degree with good second division score, Pre-Entry Test

1st Semester

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PHRY 800</td>
<td>Biostatistics</td>
<td>4</td>
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<tr>
<td>PHRY 802</td>
<td>Pharmaceutical Chemistry-I</td>
<td>4</td>
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<tr>
<td>PHRY 804</td>
<td>Pharmaceutical Chemistry-II</td>
<td>4</td>
</tr>
<tr>
<td>PHRY 806</td>
<td>Pharmaceutical Chemistry-III</td>
<td>4</td>
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2nd Semester

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PHRY 808</td>
<td>Pharmaceutical Chemistry-I</td>
<td>4</td>
</tr>
<tr>
<td>PHRY 810</td>
<td>Pharmaceutical Chemistry-II</td>
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2nd to 4th Semester

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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>PHRY 895</td>
<td>Research study on approved topic. Thesis and its Defense</td>
<td>16</td>
</tr>
</tbody>
</table>

PHRY 800 BIOSTATISTICS

PHRY 802 PHARMACEUTICAL CHEMISTRY-I

PHRY 804 PHARMACEUTICAL CHEMISTRY-II

PHRY 806 PHARMACEUTICAL CHEMISTRY-III
Drug Stability and Drug Group analysis: Drug decomposition, stabilization and preservation, kinetics kinetics of comples reactions, accelerated storages tests, expiry dates. Effect of Physical and Chemical Factors on drug stability: Thermal and Photo Stability of Pharmaceutical substances in Solid and liquid dosage forms; Photo-Chemical interaction, Photo Catalysis and Photo-Sensitization of drugs, kOxidative, hydrolytic addition, racemisation and epimerization reactions using drug as typical examples. Application of various analytical methods to the essay of antibiotics benzodiazepines, phenol-thiazones, steriods and sulphonamides.

PHRY 808 PHARMACEUTICAL CHEMISTRY-I
Combinatorial Chemistry: Introduction to reactive and functional polymers, Functional bead shaped materials-Synthesis and characterization. Polymer-supported reactions versus solution-phase reactions. Aotimated synthesis the breakthrough point. synthesis of Polypeptides, Polynucleotide, Combinatorial Chemistry- Principles, Methods and
Chemistry drug and Methodology. Redesigning combinatorial technology - from here to the unknown. Polymers in Controlled Drug Delivery.

**PHRY 810 PHARMACEUTICAL CHEMISTRY - II**

**FACULTY OF SOCIAL SCIENCES**

The Faculty of Social Sciences was established in 1989, following division of the former Faculty of Arts into present Faculties of Arts, Commerce & Business Administration, Education, Islamic Studies, Law & Social Sciences, with Prof. G.H. Khaskhel as the first Dean of the Faculty. This is the Second largest Faculty of the University. The Faculty has been actively involved in research. The journal of the Faculty of Social Sciences is a regular publication. The 3-yr Honours degree programs offered earlier by the Faculty have been changed to 4-yr Bachelor degree programs, effective by 2006 session. Classes in all disciplines are held in the morning session except Public Administration and Centre for Health & Physical Education where Evening program are also offered.

PROF. DR. ABIDA TAHERANI
Dean

**SINDH DEVELOPMENT STUDIES CENTRE**

Sindh Development Studies Centre (SDSC) established in July 1985, provides undergraduate and postgraduate teaching in development economics and conducts socio-economic research and training on development-related issues, particularly in Sindh Province. Through collaborative research and training, SDSC maintains close links with several national and international research organizations. From 1991, it availed academic linkage with Wye College, London and benefitted from exchange of teachers and training of staff. The Centre housed in its purpose-built building is equipped with State-of-Art resource and information unit, conference room, computer and audio-visual facilities. The Centre provides four categories of expert services, which include Graduate and Post-graduate Degree Programs, Academic Research Programs, Applied Research and Information Sharing.

The Centre has been offering M. Phil/Ph.D programs in Development Studies and has recently produced 5 Ph.D scholars. Presently 17 students are enrolled for Ph.D and 29 students in M.Phil Programme. SDSC has produced its first batch of BS four years program in Rural Development in 2009 and second batch in 2010. This is a unique opportunity for students, interested in acquiring basic knowledge of rural development issues in Pakistan and around the globe. The course mainly emphasizes on basic theoretical and analytical concepts of rural development.

The faculty comprises:-

PATHAN PARVEZ AHMED, Professor & Director

TAHERANI ABIDA, Professor & Dean

JARIKO GHULAM ALI, Asst. Professor

PROF. GHULAM HUSSAIN KHASKHELLY, Visiting Professor
PROF. KAZI IQBAL HUSSAIN, Professor
DR. JUNAID AKBAR SHAH, Visiting Faculty
M.Phil in Development Studies: 4-Semester Program (40)
Pre-requisite: M.A./ M.Sc. in relevant discipline e.g. Economics, Sociology, MBA, Agriculture Economics and Pre-Entry Test.

1st Semester
- DS 801 Micro Economics (4)
- DS 802 Macro Economics (4)
- DS 803 Rural Development (4)
- DS 804 Research Methodology (4)

2nd Semester
- DS 850 Natural Resource Economics (4)
- DS 851 Social Development Economics (4)

2nd to 4th Semester
- DS 895 Research on approved topic, Dissertation and Defense

Ph.D in Sindh Development Studies: 6 Semester Program: 18 CH Course work curricula under preparation
Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

DEPARTMENT OF ECONOMICS
The Department of Economics is one of the oldest departments of the University and largest one in the Faculty of Social Sciences in terms of students enrollment which stands close to 599. At present the department consists of 16 faculty members and most of them have to their credit education and training from reputed Universities of Pakistan as well as from abroad.

Teaching & Research
Besides teaching, the department also provides consultancy services and in-service training facilities. Faculty members are actively engaged in research and also provide research guidance to candidates enrolled for the degrees of M. Phil and Ph. D. From 2008 onward revised scheme of two year M. Phil is introduced in which students are offered 4 compulsory courses in first semester and two compulsory courses in second semester, total 16 CH of course work and 24 CH of Research work. At present Eighteen candidates are enrolled for M. Phil course work, six scholars are registered for M. Phil and eight promoted to Ph. D studies. The faculty has also been contributing regularly in the National/ International journals of Economics and allied fields. Their publications cover studies in various branches of Economics. They have been participating in Seminars/Workshops at National level also. Department as also engaged in research project such as Social Audit of Governance and Delivery of Public Services in Pakistan funded by UNDP 2011-12.

In-service Training
Short term refresher courses, seminars and lectures on current economic affairs are conducted at regular intervals in various branches of Economics. The faculty members of affiliated colleges generally benefit from training facilities offered by the department. The Department’s Catalogued and airconditioned Seminar Library with over 8200 books provide access to latest publications and journals on various branches of Economics with seating capacity of 40 students at a time.

The Honours and Graduate course in Economics at the 4-yr (8-semester) Bachelor degree program has been introduced since 2006 session. The courses provide advanced and up to date knowledge of Economic Theory, Quantitative Economics, Statistics, Public Finance, Research. Methodology and Applied Economics including the knowledge about the economy of Pakistan in general and province of Sindh in particular.
Economics Department conducted one day seminar on Post Budget review 2007 at the 10th July, 2007.

The courses have been designed to equip students with theoretical background and research skills in economics so that the end product becomes capable of handling economic and financial analysis to suit their job requirements.
The faculty comprises:

NANIK RAM, Asstt. Professor

CHANDIO RAFIQUE AHMED, Assistant Prof. (on Lien)

MIRZA ALBEENA, Asstt. Professor & (Incharge)
M.A. (S.U) 1989

06 Assistant Professor & 06 Lecturers

M.Phil. in Economics, 4- Semester Program (40)
Pre-requisite: Master degree in relevant discipline & Pre-Entry Test

1st Semester
- ECON 800 Research Methodology (4)
- ECON 801 Advanced Microeconomics (4)
- ECON 802 Advanced Macroeconomics (4)
- ECON 803 Econometrics

2nd Semester
- ECON 850 Applied Economics and Computer Application (4)
- ECON 851 Issues in Pakistan’s Economy (4)

2nd to 4th Semester
- ECON 895 Research study on approved topic. Thesis Desertation and its Defense (16)

Ph.D in Economics: 6 Semester Program: 18 CH Course work curricula under preparation
Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.

DEPARTMENT OF INTERNATIONAL RELATIONS

The Department of International Relations enjoys the distinction of having been established in 1972, under the directive of the then Prime Minister of Pakistan Mr. Z.A. Bhutto, in order to infuse fresh blood in the Ministry of Foreign Affairs of the country. Over the years, the department has focused its attention on teaching and research on the pattern of International Politics, from historical and empirical perspective. It is considered to be one of the largest departments with highly qualified and dedicated faculty, in the country. Several of the graduates of this department are working as academics, civil servants, diplomats, media-men and bankers, etc. at home and abroad.

The faculty comprises:-
MANGRIO NAGHMA, Professor & Chairperson
M.A. (IR) 1984, Ph.D. 2007 (S.U)

04 Assistant Professors & 01 Lecturer

M.Phil. in International Relations: 4- Semester Program (40)
Pre-requisite: Master degree in relevant discipline & Pre-Entry Test

1st Semester
- IR 800 Research Methodology (4)
- IR 801 Political Economy and the Changing Global Order (4)
- IR 802 Pakistan and the World Affairs (4)
- IR 803 World Politics in the Post Cold War Era (4)

2nd Semester
- IR 850 The Globalization and World Politics
- IR 851 New Trends in Diplomacy

3rd & 4th Semester
- IR 895 Research study on approved topic. Thesis and its Defense

DEPARTMENT OF LIBRARY INFORMATION SCIENCE & ARCHIVE STUDIES
The Department of Library and Information Science and Archive Studies was established in 1965, beginning with Certificate Courses and later Diploma Courses in the discipline of Library Science at undergraduate level, Postgraduate Diploma in Library Science (PGDLS) was started from 1970-71, and ultimately M.A. in Library & Information Science program was introduced. The department and the programs were accordingly renamed as “Department of Library Information Science & Archive Studies” and “Pg.D LIS & MLIS” respectively. At present classes for both the programs are held in the morning as full time University program. The department also offers M.Phil & Ph.D. programs in Library and Information Science which is temporary suspended.

The faculty comprises:-

The faculty comprises:-

SUBHOPOTO NIÑAR AHMED, Associate Professor & Chairman
M.L.I.S. 1990, Ph.D. 2006 (S.U)
01 Assistant Professor & 01 Lecturer

M.Phil. in Library & Information Sciences: 4-Semester Program (40)
Pre-requisite: Master degree in relevant discipline & Pre-Entry Test

<table>
<thead>
<tr>
<th>1st Semester</th>
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<tbody>
<tr>
<td>LIS 800  Advanced Research Methods in Library and Information Science (4)</td>
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<tr>
<td>LIS 801  Legal Issues and Information Handling(4)</td>
</tr>
<tr>
<td>LIS 802  Computer Applications to Library &amp; Information Science(4)</td>
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<tr>
<td>LIS 803  Statistical Methods (4)</td>
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<th>2nd Semester</th>
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<tbody>
<tr>
<td>LIS 804  Digital Library and Information Access (4)</td>
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<tr>
<td>LIS 805  User Studies and user Education (4)</td>
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<th>2nd to 4th Semester</th>
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DEPARTMENT OF MEDIA & COMMUNICATION STUDIES

This Department, founded in 1977 as Department of Journalism, was renamed as Mass Communication Department in 1985. It trains students for career in the fields of communication and journalism offering 4-yr Bachelor and Master of Arts (M.A.) program in Mass Communication. The 4-Yr. BS degree courses have been designed to provide professional education with theory- cum- research and practical based approach in every day life- like situation and meet the needs of the market and professional fields, i.e., Print/ Electronic Media, Journalism, Advertising, Public relations and development support Communication.

Practically, it is the only institution offering courses in Mass Communication to the people of rural and Urban Sindh. The Department has a well stocked Seminar Library with a fine collection of 3500 latest books and periodicals and also has two well equipped media laboratories, comprising sufficient number of Computers, Video Cameras, Editing Processors, Tape Recorders, Multi Media Projector and Laser Printer, etc.

The students are required to write report, news stories, columns, articles and features in weekly newspaper ‘Roshni’ and monthly magazine ‘Shaooor’ reflecting scholarly and independent thought. under these programs students are treatd as journalists who would one day be called upon to accept responsibilities in administrative or supervisory positions in media organization.

The faculty comprises:-

CHANG RIZWANA, Asstt. Professor & Chairperson
M.A. Journalism (S.U) 1982, Ph.D (KU) 2008

MEMON BASHIR AHMED, Asstt. Professor
M.A. Journalism (S.U) 2000, Ph.D (UK) 2011

05 Assistant Professor, 05 Lecturer & 01 Visiting Faculty

M.Phil. in Media & Communication Studies: 4-Semester Program (40)
Pre-requisite: Master degree in relevant discipline & Pre-Entry Test
The M.Phil/MS degree program in Media & Communication Studies shall be of two years minimum (04-Semester) duration, comprising mainly coursework of 16 CH during the first semester and 08-CH courses during the second semester, besides thesis research on the topic duly approved.

1\textsuperscript{st} Semester

- MC 800  Advance Mass Communication Theories (4)
- MC 801  Advance Research Methods (4)
- MC 802  The study of audiences (4)
- MC 803  International Communication (4)

2\textsuperscript{nd} Semester

- MC 804  Research Application in Mass Media (4)
- MC 805  Advance Development Communication (4)

2\textsuperscript{nd} to 4\textsuperscript{th} Semester


**DEPARTMENT OF POLITICAL SCIENCE**

The Department was established in 1953 at Elsa Kazi Campus, Hyderabad, with late Dr. Niaz-ul-Haq as its first Chairman. The departments of International Relations and Public Administration are its off-shoots, nurtured by the senior teachers of the Department of Political Science. The alumni of the Department have acquired high positions in provincial and federal services and other fields of life.

“**The Government**” (Research Journal of Political Science) under process of publication.

The faculty comprises:-

MEMON ASLAM PARVEZ, Professor & Chairman

PARDASI YASMEEN YOUSIF, Asstt. Professor

MEMON KIRAN SAMI, Asstt. Professor
M.A. (S.U) 1997, Ph.D. 2013 (SU)

03 Assistant Professor, 06 Lecturer & 01 Visiting Faculty

**M.Phil in Political Science: 4- Semester Program (40)**

Pre-requisite Master's degree in the relevant discipline; Pre-Entry Test & Interview

1\textsuperscript{st} Semester

- PLSC 800  Research Methods in the Social Sciences (4)
- PLSC 801  Computer Concepts and Application (4)
- PLSC 802  Comparative Politics (4)
- PLSC 803  Politics and Administration

2\textsuperscript{nd} Semester

- PLSC 804  International and Regional Organizations
PLSC 805    Foreign Policies of Pakistan, US, UK, Russia and China (4)
2nd to 4th Semester
PLSC 801    RESEARCH METHODS IN THE SOCIAL SCIENCES
This course is designed to explore the tools and techniques in the conduct of research in Social Sciences in general and in the field of Political Science in particular. It also describes how to assemble analyze and interpret the data. The course will also familiarize the student with a variety of research methods so that the students can choose methods most appropriate for a given area of exploration. The objective of the course is to train students in conducting research on different socio-economic problems.

PLSC 802    COMPUTER CONCEPTS AND APPLICATION
Computer Concepts and Applications provides an overview of computers, hardware; (input and output devices), application software; communications; networking; Internet use; how to purchase, install, and maintain a computer; information systems; security, issues; and multimedia. Computer-based systems can be used to solve problems. The ethical, social, and political implications of current and potential computer use are discussed. Student will be introduced to and the focus of computer concepts is on of the following software applications: Word processing, presentation, spreadsheets.

PLSC 803    COMPARATIVE POLITICS
This course provides a general overview of the major ideologies, political regimes, and socioeconomic institutions that have played a role in the formation of the contemporary world. The course also describes the practice and institutions that govern modern life. It also gives comparative analysis of the approaches to wards, politics, structural functional analysis, Group Politics, Political parties, Elites in Politics, Class Politics and Class Analysis, Ideologies and Political Development, Violence and Terrorism in Politics, evolution and Change, Leadership and Political Modernization.

PLSC 804    POLITICS AND ADMINISTRATION
Politics and administrators are charged with the momentous responsibility for implementing public polices, an increasingly complex task in modern democratic societies. In this course, students will learn the basic principles and theories that guide politics and public administration, some of the skills needed for effective politics and public administration, and a good understanding of the role of politics and public administrators in democratic governance. His course will provide a foundation for those students who want to pursue additional training for vocations in public administration and give all students a better understanding of how our government works.

This course essentially deals with the dichotomy between politics and administration. Different political and administrative theories are put into operation to enable student to get grasp of state, government, Society and policymaking. The course grasp the different issues related to bureaucracy forms of government, good governance, political culture, military in political administration in developing countries.

PLSC 805    INTERNATIONAL AND REGIONAL ORGANIZATIONS

PLSC 806    FOREIGN POLICIES OF PAKISTAN US, UK, RUSSIA AND CHINA
The main objective of this course is to enable the students to understand the philosophy of foreign policy. The emphasis is on a comparative study of foreign polices of U.S.A., U.K. Russia and China. Study of contemporary international affairs, diplomatic strategies with detailed research in student’s particular field of interest. Foreign Policy, Meaning and various determinants, Pakistan Foreign Policy for USA, Russia and China.

DEPARTMENT OF PSYCHOLOGY
The Department of Psychology was initially combined with the department of Philosophy in 1953, headed by Dr. K.A. Hameed with only a skeleton staff. It emerged as an independent teaching department in 1958with Dr. Rafia Hassan
as its first chairperson. In 1962 B.A.(Hons) classes were introduced. Award of B.Sc. and M.Sc. degree commenced in 1969. The Department introduced courses with stress on Cross Cultural Psychology at Honors and post graduate levels in 1972, with cross cultural comparison of psychological laws and analysis of social and Psychological problems of every day life and work as the main focus. The department has introduced BS-4 year program from 2006 and M.Phil. program in 2000. The job opportunities for our graduates are available in mental health clinics, hospitals, prisons, National Armed Services, educational institutions, etc.

THAHEEM NAGINA PARVEEN, Professor & Chairperson
M.A. 1987, Ph.D. 1999 (S.U.)

SHAH IRFANA, Assistant Professor
M.A. 1987, Ph.D. 2009 (S.U.)

MUMTAZ SHAHANA, Assistant Professor
M.Sc. 1993, M.Phil. 2006 (S.U.)

MALIK MUNIZA, Assistant Professor (on Study Leave)
M.Sc. 1993, M.Phil. 2005 (S.U.)

JOKHIO FARHAT, Assistant Professor (on Study Leave)

Four Lecturers

M.Phil in Psychology : 4 Semester Program (40)
The M.Phil. Program involve coursework of 24CH and Dissertation on approved topic (16). Course work requirement are as under:-

1st Semester
- PSY 800 Research Methods in Psychology (4)
- PSY 801 Issue in Cross-Cultural Psychology (4)
- PSY 802 Human Growth & Development (4)
- PSY 803 Social Psychology in Use(4)

2nd Semester
- PSY 804 Gender Issues in Psychology (4)
- PSY 805 Perspectives on Personality (4)

2nd to 4th Semester
- PSY 895 Research study on approved topic. Dissertation and its Defense (16)

PSY 800 RESEARCH METHODS IN PSYCHOLOGY
The course provides a thorough knowledge of current research methods that psychologists use to discover new principles of behavior. It enable students to approach and define research question, design experiments to address these questions, write effective scientific research reports, and critically evaluate diverse types of research designs and findings. Topics are: Psychological Research, Goals, Research Techniques, Research Problem and Hypotheses and Design, Methods of Data Collection, Survey Research Technique, Questionnaires, Experimental and Quasi-experimental Designs, Reactive and Non-Reactive Research, Application and issues, Qualitative/ Quantitative Research in Psychology, Ethical issues in Psychological Research, Psychological Research in Pakistan.

PSY 801 ISSUE IN CROSS-CULTURAL PSYCHOLOGY
The course is designed to explain human behavior as a product of culture in global perspective and the topics are focused on the impact of society on the particular behaviors of concern course includes Culture and Psychology, Cross Cultural Research Methods, Indigenous Psychology, Family and Human development across cultures, Culture and Basic Psychological Processes, Ethnocentrism, Prejudice and Stereotypes, Culture and Social Behavior, Culture, Language and Communication.

PSY 802 HUMAN GROWTH & DEVELOPMENT
The course comprehensively examines all aspects of human developmental psychology, with focus on current issues, theories and models for understanding human developmental processes. Such as, key themes in Human Development Theories of Human Development, Stages of Development, Developmental Psychopathology, The family, The Development of Sex Roles, Morality, Altruism & Aggression, Child Counseling and Education and Adulthood and aging.

**PSY 803 SOCIAL PSYCHOLOGY IN USE**

The course focuses on the applications of social psychological theory and research in various domains of personal, Institutional and societal well being. Applications of Social Psychology to Mental and Physical health, Marital Therapy, Social Psychology Applied to Law and Politics and the World of Work, Consumer Behavior, Environment and to communication Technologies are the main topics.

**PSY 804 GENDER ISSUES IN PSYCHOLOGY**

The course is designed to introduce current concepts in Psychology regarding gender issues. It also opens up new perspectives on gender roles focusing on Women Studies, Theories of Female Development, Femininity, Masculinity and androgyny, Gender Differences in Personality and Behavior, Problems of Adjustment and Psychotherapy, Violence against Women, Cross Cultural Perspectives on the Gender role and Culture and Gender.

**PSY 805 PERSPECTIVES ON PERSONALITY**

The course focuses on current research with implication for theories of personality. Methods to study various types of personality and highlights the cross-cultural studies and research on personality. The study of Concept of Personality, important issues in Personality theory, the cultural Psychology of personality, Methods in the study of personality, Perspectives, the Psychodynamic and Phenomenological perspective, learning and the information processing perspective, overlap and integration among perspectives on personality are included in course.

**DEPARTMENT OF PUBLIC ADMINISTRATION**

The Department of Public Administration was established in 1985 under the faculty of social Sciences, University of Sindh through the concerted efforts of the then (and now the present) Vice-Chancellor, Mr. Mazharul Haq Siddiqui, and Dr. Mohammad Hassan Shaikh, the department's first Chairman.

The main objective of establishing this department were to train and equip the students in the area of administrative science to contribute productively towards the development efforts in Pakistan. The department caters to the needs of students of pursuing a professional career in public or private sector and/or in non-governmental organizations.

The department offers a four-year bachelor degree, and a Masters degree with specialization in Marketing Management, Human Resource Management, Finance Management and Management Information System. The 4-years BS degree or Master's degree leads to 4-semester MS/M.Phil & Ph.D Program with course work and thesis.

The faculty comprises:-

**BURDEY, MUHAMMAD BUX, Professor & Chairman**  

**ABBASI, ZAREEN, Professor**  
M.P.A. (GAU) 1993, Ph.D. (KU) 2006

**KANDHRO, SIRAJUL HAQ, Associate. Professor**  
M.P.A. (S.U) 1989, M.Sc(IT), Ph.D (Thailand), 2012

**SYED, NAIMATULLAH SHAH, Asstt. Professor**  
M.P.A. 1994, M.Phil. (SU), Ph.D(UK) 2010

**LALANI, FARAH, Asstt. Professor**  

**ABBASI, MUHAMMAD SHARIF, Lecturer**  
M.Sc. Computer Sc. (SU) 2003, Ph.D (UK) 2011

07 Assistant Professors, 01 Lecturers, 02 Teaching Assistant & 01 Visiting faculty

**M.Phil in Public Administration: 2-yr, 4-Semester Program (40)**

Pre-requisite: BS/MPA degree or equivalent qualification and Pre-Entry Test.  
The curricula and course outlines are as under:-

**1st Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>PA 800</td>
<td>Research Methods in the Social Sciences</td>
<td>4</td>
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</table>
PA 801 Information Technology in Business Management (4)
PA 802 Issues and Practices in Behavioural Sciences (4)
PA 803 Strategic Human Resource Management (4)

2nd Semester
PA 850 Managing Change and Innovation (4)
PA 851 Advanced Marketing Research (4)

3rd to 4th Semester
PA 895 Research on approved topic, Thesis/ Dissertation and its Defense

PA 800 RESEARCH METHOD IN THE SOCIAL SCIENCE
This course is designed to familiarize students with the tools and techniques in the conduct of research in social science in general and in the field of Public Administration in particular, with the objectives to train students in conducting research on different social and economic problems and in writing reports. Nature of Social Research, Empirical Research, scientific approach, concepts, hypothesis, variables. The system approach as problem solving methodology in Public Management, Data collection techniques: observation, interview questionnaire, content analysis interpretation of data, index, scale and sampling techniques, statistical analysis, Research Communication.

PA 801 INFORMATION TECHNOLOGIES IN BUSINESS MANAGEMENT
This course introduces student to the application of information technology in a Business Management environment. Information Technology Groundwork, Application Software in Business Management, Electronic Communication, Gathering Electronic information, Information Technology and your Future.

PA 802 ISSUES AND PRACTICES IN BEHAVIORAL SCIENCE
This course stresses Public Administration as an interdisciplinary pursuit with particular emphasis on Psychology, Anthropology and Sociology. Approaches to the study of personality, Development of human behavior. Internal and External environment, their impact on behavior, Basic Psychological processes, Social Stratification of societies and Organizations at various levels, Strategies and mechanism of change of various levels of Social Organization.

PA 803 STRATEGIC HUMAN RESOURCES MANAGEMENT

PA 850 MANAGING CHANGE AND INNOVATION
This course aims to enable the students to understand the importance of managing strategic change in organizations and to enhance the effectiveness of executives in making strategic decisions in a creative manner. Managing organizational change, Creative approaches to problem solving, Leadership for innovation and Developing the Innovation Organization, Organization transformations in various sectors and cross-cultural response to change management.

PA 851 ADVANCED MARKETING RESEARCH
This course aims to provide students with an overall framework to structure the disciplines of marketing research with emphasis on understanding marketing research techniques and the compilation of a marketing research project. Marketing Research, overview of available methodologies, Quantitative, Qualitative Research. Suggestions for research Proposal.

PA 895 M.PHIL THESIS AND SEMINARS
The students of M.Phil must write a thesis in the selected area, which should earn them 16 credits. The students must submit the proposal for approval of topic for the thesis through the proposed Supervisor and the chairman of the
department at the commencement of 2nd semester of the program. Student will not be eligible for the award of M.Phil degree without scoring CGPA 3 or above in coursework and submission of M.Phil Thesis.

**M.Phil Leading to Ph.D in Public Administration:**

4-Semester Program (72)

The primary objective of the Ph.D (Doctor of Philosophy) in Public Administration are to provide doctoral students with the philosophical, theoretical and substantive material necessary to acquire advance understanding the field of Public Administration, to provide opportunities to conduct research in each of the courses offered, to assist doctoral students in acquiring the methodological skills needed to complete a major independent research project, and to develop researchers proficient in understanding major research projects in public and nonprofit sectors. The mission and program objectives are met by delivering a theoretically and intellectually stimulating program in a manner that encourages integration of course materials and promotes reflection on them. A variety of pedagogical methods will be used to challenge the thinking and facilitate the continued development of mid-career students.

Pre-requisite: Those students to get admission Ph.D program he/she must qualify Comprehensive Examination of M.Phil (24 Credits) Subjective GRE, one Research Article published in HEC Recognized Journal before submission of final dissertation, then he/she will be promoted for Ph.D

<table>
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<tr>
<th>1st Semester</th>
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<tr>
<td>PAD 900 Organizational Theory &amp; Research (4)</td>
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<tr>
<td>PAD 901 Inferential Statistics (4)</td>
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<td>PAD 902 Issues in advance Research (4)</td>
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<th>2nd Semester</th>
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<tr>
<td>PAD 903 Research Ethics (3)</td>
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<td>PAD 904 Research Project Management (3)</td>
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<tr>
<th>3rd to 4th Semester</th>
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<tr>
<td>PAD 905 Research on approved topic, Thesis and its Defense</td>
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</table>

**DEPARTMENT OF SOCIOLOGY**

The Department of Sociology was established at Hyderabad Campus in 1964 with Prof. Shafi Mohammad Memon as its first chairman. The department was shifted to Allama I.I Kazi campus Jamshoro in 1970. This department has been imparting quality education. Courses have been designed to equip students with professional skills and knowledge relevant to the changing needs of society and many of the graduates of this department are currently holding executive positions in private as well as in government sector. The seminar library is equipped with 2000 books and provides access to latest publications and journals on various topics of Sociology. Faculty members are actively engaged in research and also provide research guidance to candidates enrolled for M. Phil and Ph. D program. Eight M. Phil scholars after having successfully completed their coursework in 2009 are
registered to complete their thesis work on different topics under the guidance of Prof. Dr. Tanvir Junejo, Prof. Khalida Shaikh, Dr. Hamadullah Kakepoto, Dr. Aijaz Ali Wassan and Dr Saima Shaikh.

The faculty comprises:-

KAKEPOTO HAMADULLAH, Assoc. Professor & Chairperson

SHAIKH SAIMA, Associate Professor

WASSAN AJAZ HUSSAIN, Associate Professor
M.A. 1998; Ph.D. 2008 (S.U)

BROHI AHMED ALI, Asstt. Professor
M.A. 1998, M.Phil. 2006 (S.U)

TABSSUM NAIMA, Lecturer
M. A . (SU) 2001, Ph.D (Turkey) 2011

02 Assistant Professors & 04 Lecturers

**MS/M.Phil in Sociology: 4- Semester Program (40)**

Pre-requisite: BS/ M.Sc. in Sociology, Pre- Entry Test

1st Semester

SOC 800 Advanced concepts in Sociology (4)
SOC 801 Research Methodology (4)
SOC 802 Human Rights (4)
SOC 803 Social Problems (4)

2nd Semester

SOC 804 Gender Sociology (4)
SOC 805 Social Statistics (4)

3rd to 4th Semester

SOC 895 Research on approved topic, Thesis and its Defense

**Ph.D 6 Semester Program: 18 CH Course work Courses under preparation.**

Pre-requisite: MS/M.Phil degree & valid GRE/GAT (Subject) Test result.