

PROSPECTUS



INSTITUTE OF GEOLOGY UNIVERSITY OF THE PUNJAB LAHORE

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Message from the Vice-Chancellor

Geology addresses some of the basic challenges of the 21st century, those of exploring, exploiting and managing Earth resources whilst minimizing the environmental impact of extraction. It is indeed an area of key importance for socio-economic development of the country. The requirement for skilled geologists has even increased for the developing country like Pakistan, which has been hit hard by surging oil prices.

Institute of Geology is one of the earliest departments of the Punjab University, providing the trained indigenous workforce equipped with strong academic background in natural resources exploration and related issues. The alumni of the Institute of Geology have provided the core of the geological profession in Pakistan who have served major professional bodies in the country and led major discoveries of industrial and metallic minerals, oil and gas.

Over the years, the Institute of Geology has evolved to hold a unique position in the country in geologic education. Bachelor of Science degree being offered at the Institute of Geology blends theory, observation, laboratory studies and integration of basic sciences with special emphasis on fieldwork. While Master of Science in Applied Geology is a professional career oriented program, having diversified fields of specialization addressing major areas of geosciences, enabling the students to take up specialized professional career as geologists in industry and to be prepared to step forward to higher education in a specific field of geology. The Institute also offers M.S./ M. Phil leading to Ph.D. in diversified fields of Geology.

Punjab University intends to improve the infrastructure conditions by providing increased research capabilities and state-of-the-art lab facilities, libraries and computer labs. for achieving the University's educational and research missions with special emphasis on the emerging subjects like geology. The modernization of the petrographic sample preparation facilities of the Institute and addition of research microscope is a paradigm. I hope that this addition will strengthen the Institute and allow it to continue its tradition of excellence in teaching and research.

Prof. Dr. Zafar Mueen Nasir
Vice Chancellor



Message from the Director

Nothing is more fundamental to Pakistan than its natural resources, to its history and future. It was valid in 1947 and it is true today. How we respond to natural resources development question today will shape the Pakistan tomorrow. The answers we find must ensure the maximum probable utilization of the natural resources, safety of the public, the vitality of the economy and the health of the environment. As a territory of unique and occasionally dangerous geology, we need to build constructions with a high degree of protection against earthquakes and landslides.

Geologists address a diverse range of issues such as sustainable development of natural resources, assessment of natural geohazards, land-use planning in urban and rural settings, the environmental impact of the geological disposal of waste products, groundwater system modeling, flood remediation, balancing the need for energy and mineral resources with the environmental impacts of their extraction, and fulfill the national strategic requirements for geological data, a few to mention here. So highly trained manpower in this field is vital for the socio-economic development of the nation.

The Institute of Geology, the oldest seat of geological learning of the country, has been establish with a broad base to offer ample opportunities for the study and research in the diversified fields of Geology. Presently, the Institute of Geology endeavors to produce high ranking professional geologists in the fields of Petroleum & Structural Geology, Sedimentology & Industrial Mineralogy, Mineralogy & Petrology, Palaeontology, Stratigraphy, Geochemistry and Environmental Geology. We intend to introduce new disciplines in the emerging fields relevant to earth sciences, mainly including Exploration Geochemistry, Environmental Geochemistry, Nuclear Geology, Medical Geology, Gemology and Hydrology to respond to the emergent needs of the Nation.

(Prof. Dr. Shahid Kamal)
Incharge

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INTRODUCTION

At the time of independence in 1947, no school of geological learning was present in the region that constituted the (present) Pakistan. The initiative was taken by the Punjab University and the Department of Geology was established in 1951, offering a Geology course at intermediate level. It was discontinued in 1953 after completion of only one class of students. In 1952, Punjab University opened an independent Department of Mineralogy under a UNESCO-Pak Government collaboration program. Prof. O. A. Broch from Norway arrived in April, 1952 as Head of the Department. This department offered a course of specialization in Mineral Chemistry for the M. Sc. final year students; the course was discontinued by 1953 after producing only one class of students.

In January 1954, the two departments were combined into the Department of Geology and Mineralogy, under Professor, O. A. Broch and housed in the building now occupied by the Habib Bank at the Allama Iqbal Campus. The first B.Sc. class in Geology was completed under this Department. In 1955, Professor N.R. Martin, (U.K.) UNESCO Advisor, took over as Head of the Department. The first M. Sc. class in Geology was produced in 1957.

By 1958, it was planned to build this department in such a manner as to impart a balanced geological background in various major disciplines of the subject of the four major fields of the subject Paleontology and Stratigraphy, Mineralogy and Petrology, Petroleum Geology & Structure, Applied Geophysics and department was re-titled Department of Geology.

Divisions of the Institute

In August, 1979, the Institute was divided into three administrative and academic divisions; as defined in an office notification of the University and they worked as follows: **(i). Division of Economic Geology** which incorporate, Mineralogy, Petrology, Geochemistry and Industrial Mineralogy. Dealing with subjects concerned with minerals, ores and rocks. **(ii). Division of Petroleum Geology** deals with Paleontology / Stratigraphy, Petroleum Geology / Structural Geology and Sedimentology. Dealing with subjects concerned with natural hydrocarbons. **(iii). Division of Applied Geo-Sciences** includes Engineering Geology, Geohydrology, Applied Geophysics and Environmental Geology. Dealing with subjects that are employed by geologists in search of natural resources and construction of engineering works.



Laboratories

In order to provide better training, the theoretical instructions in various disciplines are complimented by extensive laboratory work. In addition, there are advanced research laboratories for research students and teaching faculty. At present following laboratories are functioning in the Institute.

- i). Paleontology & Stratigraphy laboratory
- ii). Advanced Micropaleontology Laboratory
- iii). Mineralogy and Petrology Laboratory
- iv). X-Ray Diffraction & STA Laboratory
- v). Industrial Mineralogy Laboratory
- vi). Engineering Geology Laboratory
- vii). Material Testing Laboratory (Aggregates)
- viii). Geophysics Laboratory
- ix). Geoseis Modeling Laboratory
- x). Geochemistry Laboratory
- xi). Advanced Wastewater Treatment Laboratory
- xii). Sedimentology Laboratory
- xiii). Photographic Laboratory
- xiv). Chemistry Laboratory
- xv). Physics Laboratory
- xvi). Computer Laboratory
- xvii). XRF Laboratory
- xviii). GEOSIES Laboratory



These laboratories are placed under administrative control of relevant Divisions. A drawing and drafting section caters to students and faculty in the preparation of reports, thesis and publications.



Workshops

The Institute is equipped with several workshops including a mechanical, a rock cutting and thin-section making set-up. The mechanical workshop undertakes repairs and maintenance of scientific equipment as well as precision scale sampling. The rock-cutting section provides thin section and ore-polishing services to students as well as faculty in connection with their research work.

Transport

The Institute also maintains a fleet of 03 vehicles for the fieldwork of the students and the staff. This constitutes one jeep, a twin cab and Toyota Hiace Van (Hi-Roof). The teacher(s), who are supervising the student's fieldwork, may take vehicle(s) for the required period. The vehicle may also accompany the field excursions as well as on the research programs of the faculty members.

Library

The library of the Institute has many important publication series, such as various expedition reports and collection of memoirs and records of the old (pre-1947) Geological Survey of India, Scientific journals and reprints of papers. It has a collection of several thousand books and journals on all subjects related to the curricula and research requirements. Books other than for reference can be borrowed by students but not more than two volumes at a time. The reference books are to be consulted inside the library. Every student is issued a library membership card for this purpose. The borrower can retain books for a period of up to two weeks and are renewable on request.

Every year textbooks and journals are added to the collection and rarely books are photo-copied for the benefit of students. The Library exchanges publications with many teaching and research institutions of the world. A unique set of Geological literature in the Library consists of M. Sc. and Ph.D. theses and field reports based on original works of the students during their final year of studies.

The Institute is supported by the provision and facilities from the British Council, Quaid-I-Azam Library and Main Library University of the Punjab at the Quaid-I-Azam Campus.

Conference Hall

Institute of Geology has recently furnished a state-of-the-art conference room for the organization of seminars special lectures in order to enlighten the students with up-to-date research activities and sharing of knowledge. The conference room is equipped with modern audio video apparatus.

Museum

The Museum of the Institute has thousands of minerals, ores, rocks and fossils belonging to standard and recognized geological localities of Pakistan and foreign countries. This collection serves as reference in research work as well as in laboratory for the training of the students. The museum also provides a lot of interest for general public and visiting students from different schools and colleges from time to time.



Geological Park

A Geological Park in the Institute of Geology has been constructed in order to demonstrate the geological features. The Geological Part has been intricated with the models of Terbela Dam, Ghazi Brotha Dam, Salt Range Model and Oil Rig Mode.

Material Stores

In addition to material storage in Museum, a large number of specimens are kept in various parts of the institute, particularly those, which are concerned with research projects. These are beside the material stored in the laboratories for practical training of students. Each year students bring samples of their thesis from different areas concerning to their project(s) work. These division for further research. Specimens are also exchanged with Universities and Research Organizations of Pakistan and foreign countries.

Geological Bulletin

Since 1961, the Institute has been publishing an annual journal called “Geological Bulletin of the Punjab University” which is mostly based on research work done by the students and the staff. In addition, research papers are included from other national and international scientists. A special series of teaching supplements are also part of Bulletin publication for use by the students.

COURSE OFFERED

Degree	Duration
B.S. Applied Geology	04 years
M.Phil Applied Geology with specialization in <ul style="list-style-type: none">· Mineralogy / Petrology· Stratigraphy / Micropaleontology· Petroleum and Structural Geology· Engineering Geology· Geophysics	02 years
Ph.D. Program	03-05 years

INCHARGE, INSTITUTE OF GEOLOGY

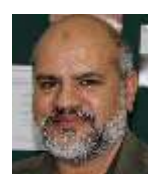
Prof. Dr. Shahid Kamal

M.Sc. (Pb.), Ph.D. (Leeds, U.K.)

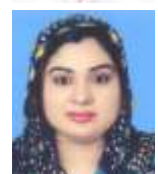


FACULTY MEMBERS

- 1. Prof. Dr. Shahid Kamal**
Incharge
M.Sc. (Pb.), Ph.D. (Leeds, U.K.)
- 2. Prof. Dr. Shahid Ghazi**
Professor
M.Sc. (Pb.) Ph.D. (Leeds, UK.)
Petroleum Exploration, Sedimentology & Sequence Stratigraphy
- 3. Dr. Shahid Jameel Sameeni**
Associate Professor
M.Sc. (Pb.), COMETT-EUCOR Micropal (Swiss Basel), Ph.D. (Pb.), Post-Doc UC, Berkley, (USA)
Micropaleontology & Stratigraphy
- 4. Dr. Naveed Ahsan**
Associate Professor
M.Sc. (Pb.) Ph.D. (Pb.)
Tectonics & Structure Geology
- 5. Dr. Mustansar Naeem**
Assistant Professor
M.Sc. (Pb.), Ph.D. (Pb.)
Mineralogy Petrology, Industrial Mineralogy, Geochemistry, Aggregate
- 6. Mr. Abdus Sattar**
Assistant Professor
M.Sc. (Pb.), M.Phil (Pb.)
Geochemistry, Mineralogy & Petrology
- 7. Dr. Kamran Mirza**
Assistant Professor
M.Sc. (Pb.), Ph.D. (Pb.)
Micropaleontology, Stratigraphy
- 8. Mr. Zia-ud-Din**
Assistant Professor
M.Sc. (Pb), M.Phil (Pb.)
Geophysics
- 9. Dr. Mian Sohail Akram**
Assistant Professor
M.Sc. (Pb), PhD. (New South Wales, Sydney
Australia)
Rock Mechanics, Geomechanics, Soil Mechanics, Geohydrology



10. **Dr. Perveiz Khalid**
Assistant Professor
M.Sc. (Q.A.U), Ph.D. (Pau, France)
Rock Physics, Reservoir Geophysics, Hydrogeophysics, Seismic hazards
11. **Dr. Muhammad Irfan Ehsan**
Assistant Professor
M.Sc. (Pb.), Ph.D. (Beijing, China)
Exploration Geophysics
12. **Mr. Muhammad Sanaullah**
Lecturer
M.Sc. (Pb.), M.Phil (Pb.)
Engineering Geology
13. **Mr. Adnan Abdul Karim**
Lecturer
M.Sc. (Pb.), M.Phil (Pb.)
Micro-Paleontology
14. **Mr. Muhammad Armaghan Faisal**
Lecturer (on study leave)
M.Sc. (Pb.), M.Sc. (Denmark)
Petroleum & Structure Geology
15. **Rana Ammad Bin Sadiq**
Lecturer (on study leave)
M.Sc. (Pb.), M.Phil (Pb.)
Engineering Geology & Geohydrology
16. **Mr. Salman Farooq**
Lecturer
M.Sc. (Pb.), M.Phil. (Pb.)
Engineering Geology & Geohydrology
17. **Mr. Shahid Ali**
Lecturer
M.Sc. (Pb.), M.Phil. (Pb.)
Petroleum & Structural Geology, Mapping techniques
18. **Ms. Mehwish Akram**
Lecturer
M.Sc. (Pb.), M.Phil. (Pb.)
Chemistry
19. **Mr. Nisar Ahmed**
Lecturer (on Contract)
M.Sc. (Pb.), M.Phil. (Pb.)
Geophysics



VISITING STAFF

Whenever required, senior staff of the University or from various geological organizations is engaged for part-time teaching.

OFFICE STAFF

- Mr. Bashar-ul-Islam (Admin. Officer) on Contract
- Mr. Muhammad Asghar (Admin. Officer)
- Mr. Nadeem Younas (Private Secretary)
- Mr. Muhammad Aurangzeb (Store Superintendent)
- Muhammad Shafiq (Sr. Stenographer)
- Mr. Tayyab Ejaz (Sr. Clerk)
- Mr. Muhammad Imran (Stenographer)
- Mr. Qaim Ali Shah (Sr. Clerk)
- Mr. Zahid Siddique (Jr. Clerk)
- Mr. Abdul Waqar (Jr. Clerk)

LIBRARY STAFF

- Mr. Haji Mahmood (Senior Librarian)
- Mr. Muhammad Jahangir (Assistant)
- Mr. Muhammad Rafi (Attendant)
- Ms. Tyabba Javed (Lib. Attendant)

TECHNICAL STAFF

- Mr. Muhammad Ilyas (Head Lab. Assistant)
- Mr. Tasneem Ahmad Khan (Draftsman)
- Mr. Sami Ullah Khan (Jr. Technician)
- Mr. Syed Sajid Hussain Shah (Lab. Assistant)
- Mr. Muhammad Arfan Akhtar (Lab. Assistant)
- Mr. Asad Ahmad (Museum Assistant)
- Mr. Muhammad Riaz (Driver)
- Mr. Abdul Razzaq (Driver)

SERVICE STAFF

- Mr. Nazir Ahmad
- Hafiz Malik Nazir Ahmad
- Mr. Ghulam Mustafa
- Mr. Syed Asif Ali Shah
- Mr. Naseer Hussain
- Mr. Muhammad Ramzan
- Mr. Qudrat Ullah
- Mr. Javed Pitras
- Mr. Muhammad Imran
- Mr. Tanveer Hussain
- Mr. Adnan Ahmad
- Mr. Muhamad Zeeshan
- Mr. Shahbaz Ali
- Mr. Ali Raza



ADMISSION TO B.S. (4 YEARS) APPLIED GEOLOGY (ANNUAL SYSTEM)

ELIGIBILITY

Admission to B.S. Applied Geology (4 years) in the Institute will be open to any student who:

- i). Has passed the Intermediate Examination with Pre-Engineering /Pre-Medical / ICS (Physics, Math, Computer) and 03 years DAE groups of the Boards of Intermediate & Secondary Education, Lahore, Sargodha, Faisalabad Rawalpindi, Multan, Gujranwala or any other examination considered equivalent there to by the Punjab University.
- ii). Is medically fit, duly certified by D.H.O/University Medical Officer; besides general health, the student should be capable of field work and should not suffer from color blindness for the purposes of optical work.
- iii). Is not more than 24 years of age.
- iv). In the case of candidates securing equal number of marks merit will be determined on the basis of marks obtained in the immediately lower examination.
- v). The candidates who have secured less than 45% marks in F. Sc. and those placed in compartment are not eligible.

MERIT CRITERIA

- Academic Qualification: 100%

MERIT FORMULE

Basic formula as per University Policy

$$\frac{\frac{1}{4} \text{ of Matric} + \text{Total Marks in F.Sc} + 20 \text{ Marks (if candidate is Hafiz-e-Quran)}}{\frac{1}{4} \text{ of Total Marks of Matric} + \text{Total Marks of F.Sc.}} = A$$
$$\% \text{ age Score} = 100 \times A$$

NOTE: Application must be accompanied by the photocopies of the following documents:

- i) Matriculation
- ii) F. Sc.
- iii) Character certificate
- iv) Hafiz-e-Quran (if any).

The candidate should produce a certificate from a well-established institute to the effect that he/she is a Hafiz-e-Quran. Moreover, Admission Committee of the Institute will interview the candidate and make sure that the candidate has learnt the Quran by heart and can recite it from whatever portion he is required to recite.

- v) Migration certificate (in case the applicant passed F. Sc. from a Board other than Board of Intermediate and Secondary Education, Lahore).
- vi) One copy of the latest passport size Photograph

Application incomplete in any respect or not submitted on the prescribed form or received in the office of the Institute after the closing date will not be entertained. General waiting list along with list of the selected candidates will be displayed on the Notice Board of the Institute only.



Candidate Selected for Admission Shall:

- a) Collect the Bank Challan form duly signed by the Incharge Admission/Director, Institute of Geology at least one day before the last date for making the payment of the University dues as per schedule on the submission of the following documents in original.
 - i) Matriculation Certificate
 - ii) F. Sc. Certificate
 - iii) Domicile Certificate
 - iv) Medical Fitness Certificate
 - v) Two copies of the latest passport size photograph
 - vi) Hafiz-e-Quran certificate (if any)
- b) Deposit their dues with the Habib Bank Ltd, Punjab University, Quaid-e-Azam Campus by the closing hour of the bank till the due date mentioned in the admission schedule, failing which the seat will stand vacated automatically. The admission of the candidate shall be cancelled in case he is found guilty of concealing the facts, supplying wrong information and producing bogus documents. Such applicants shall be liable for prosecution under the code of law.
- c) Collect the Registration card from the office of the Institute the same day after submitting the receipt of the Bank in original along with its photocopy in order to regularize the admission, failing which the admission of the candidates shall be cancelled.

The candidates for admission will be selected on merit against the vacant merit seat/s, if any available, in a particular discipline from amongst the candidates whose names appear in the final waiting list and who have reported in writing along with their original documents their availability to the Director on the date by the fixed time as per schedule notified. The candidate/s thus selected for admission shall be required to deposit the University dues as per given schedule and collect the Registration Card to get the admission regularized. Those who do not fulfill the aforesaid requirements shall be deemed to have forfeited their right of admission.

DISTRIBUTION OF SEATS (MORNING)

· Total Number of Seats:	48
· F.Sc. (Pre-Engg. / Pre-Medical), ICS and *DAE:	39+1
· Reserved seats:	08

DISTRIBUTION OF SEATS (REPLICA)

· Total Number of Seats:	42
· F.Sc. (Pre-Engg. / Pre-Medical), ICS and *DAE:	39+1
· Reserved seats:	02

Note: Candidates having degree of DAE are allotted only 01 seat in the open merit quota. Reserved seats shall be allotted only to students eligible according to the regulations for admission.

The breakup of reserved seats is as follows:

- i) Children/real brothers or sisters of the Punjab University teachers serving or retired, with service of not less than 5 years. Preference will be given to the children (2% with a minimum of one seat).
- ii) Children/real brother or sisters of the Punjab University employees, serving or retired, with service of not less than 5 years. Preference will be given to children (2% with a minimum of one seat)
- iii) Sports Basis: The admission on sports seats will be according to the University rules & regulation.



- iv) Extra Curricular-Debates: (01 seat)
- v) Expatriate Pakistanis (01 seat)
- vi) Children of Pakistan Army Personnel (01 seat)
- vii) Industrial Based (01 seat)
- viii) Disable (01 seat)
- ix) Foreign Education holder
- x) The Vice Chancellor can permit admission of more than one eligible foreign applicant on the recommendation of Dean/Director out of the students whose names are recommended by the Ministry of Education, Government of Pakistan.

All the applications / nominations / recommendations must reach the office of the Institute within the due date fixed for the receipt of applications. No document will be entertained after the due date.

Applicants from foreign countries must route their application through the Ministry of Education, Government of Pakistan, Islamabad. The application must accompany a Nationality certificate.

Note: Children of the Punjab University employees (teachers and others) must submit a service certificate of their parents from the Registrar, University of the Punjab.

Further details of the admission rules shall be formed by the Board of Studies in Applied Geology and duly notified by the Director at the time of advertisement for admission to the particular level.

A student may be asked to withdraw or be dropped from rolls of the Institute if at any time the Director is not satisfied with the character, conduct and academic performance of the student. Such an action will require approval and confirmation by the board of Studies in Applied Geology.

COURSE STRUCTURE OF B.S. APPLIED GEOLOGY (04 YEARS DEGREE PROGRAM)

FIRST PROFESSIONAL

Sr. No.	Course	Marks		
		Theory	Practical	Total
I.	A. Islamic Studies B. Pak Studies	60+40	-	100
II.	English	100	-	100
III.	Mathematics I	100	-	100
IV.	Physics I	75	25	100
V.	Chemistry I	75	25	100
VI.	Mineralogy	75	25	100
VII.	General Geology	100	-	100
VIII.	Paleontology	75	25	100
IX.	Geomorphology	75	25	100
X.	Fieldwork I	50	50	100
TOTAL:		825	175	1000



SECOND PROFESSIONAL

Sr. No.	Course	Marks		
		Theory	Practical	Total
I.	Communication Skills & Technical Report Writing	100	-	100
II.	Mathematics II	100	-	100
III.	Physics II	75	25	100
IV.	Chemistry II	75	25	100
V.	Stratigraphy of Pakistan	75	25	100
VI.	Computing & Geostatistics	50	50	100
VII.	Survey & Mapping Techniques	50	50	100
VIII.	Petrology	75	25	100
IX.	Nuclear Geology	75	25	100
X.	Structural/Petroleum Geology	75	25	100
XI.	Fieldwork II	50	50	100
TOTAL:		800	300	1100

THIRD PROFESSIONAL

Sr. No.	Course	Marks		
		Theory	Practical	Total
I.	Geology & Tectonics of Pakistan	75	25	100
II.	Sedimentology	75	25	100
III.	Economic Geology	75	25	100
IV.	Remote Sensing & GIS	75	25	100
V.	Micropaleontology	75	25	100
VI.	Geophysics	75	25	100
VII.	Geochemistry	75	25	100
VIII.	Engineering Geology & Hydrogeology	75	25	100
IX.	Advance Mineralogy and Applied Lab Techniques	75	25	100
X.	Environmental Geology	75	25	100
XI.	Fieldwork III	50	50	100
TOTAL:		800	300	1100



FOURTH PROFESSIONAL

In the 4th Professional Class students will be required to adopt a specialization and will be offered four subjects from the module of their relevant specialization listed below depending upon the availability of the faculty.

Sr. No.	Course	Marks		
		Theory	Practical	Total
I.	Special Paper I	75	25	100
II.	Special Paper II	75	25	100
III.	Special Paper III	75	25	100
IV.	Special Paper IV	75	25	100
V.	Thesis	400		400
TOTAL:		700	100	800

Specializations in B.S. Applied Geology (04 years degree program)

GROUP-I MINERALOGY AND PETROLOGY

This comprises the following courses:

1. Geochemistry
2. Igneous Petrology
3. Metamorphic Petrology
4. Sedimentary Petrology
5. Advanced Mineralogy

GROUP-II: GEOCHEMISTRY

This group comprises the following courses:

1. Thermodynamics
2. Geochemical Exploration
3. Isotope Geochemistry
4. High Temperature Geochemistry
5. Low Temperature Geochemistry

GROUP-III PALEONTOLOGY AND STRATIGRAPHY

This group comprises the following courses:

1. Advanced Stratigraphy
2. Micropaleontology
3. Invertebrate Paleontology
4. Vertebrate Paleontology
5. Palynology and Paleobotany

GROUP-IV SEDIMENTOLOGY

This group comprises the following courses:

1. Clastic Sedimentology
2. Carbonate Sedimentology
3. Sedimentary Petrology
4. Basin Analysis
5. Quaternary Geology
6. Clay Mineralogy

GROUP-V: ECONOMIC GEOLOGY

This group comprises the following courses:

1. Ore Deposits
2. Mineral Exploration
3. Coal Geology
4. Mining Geology
5. Mineral Economics.
6. Metallogeny and Plate Tectonics

GROUP-VI HYDROGEOLOGY

This group comprises the following courses:

1. Hydrology
2. Groundwater Investigations
3. Groundwater Engineering
4. Hydrochemistry & Groundwater Pollution

GROUP-VII: ENGINEERING GEOLOGY

This group comprises the following courses:

1. Rock Mechanics
2. Soil Mechanics
3. Seismotectonics
4. Engineering Geology

GROUP-VIII: INDUSTRIAL MINERALOGY

This group comprises the following courses:

1. Industrial Mineralogy
2. Geology & Technology of Industrial Minerals and Rocks
3. Instrumental Techniques
4. Mining Geology and Mineral Economics



GROUP-IX: PETROLEUM GEOLOGY

This group comprises the following courses:

1. Petroleum Geology
2. Sequence Stratigraphy
3. Petroleum Engineering & Geophysical Methods.
4. Reservoir Geology
5. Clay Mineralogy
6. Organic Geochemistry
7. Petroleum Geology of Pakistan

GROUP-X: ENVIRONMENTAL GEOLOGY

This group comprises the following courses:

1. Environmental Geology
2. Soil and Water Resources
3. Environmental Hazards
4. Hydrological Systems and Environment
5. Environmental Impact Assessment and Management.

GROUP-XI: APPLIED GEOPHYSICS

This group comprises the following courses:

1. Seismic Methods and Seismic Stratigraphy
2. Earthquake Seismology
3. Geomagnetism, Paleomagnetism
4. Radiometric Methods
5. Electrical Methods and Bore-Hole Geophysics
6. Geophysical Data Processing
7. Gravity and Magnetic Methods

GROUP- XII: STRUCTURE, TECTONICS AND NEOTECTONICS

This group comprises the following courses:

1. Structural Geology
2. Metamorphic Structures
3. Applied Structural Techniques
4. Tectonics of Pakistan
5. Regional Tectonics
6. Neotectonics

GENERAL RULES & REGULATION FOR B.S. APPLIED GEOLOGY

1. The title of the degree will be BS (4 years) Applied Geology.
2. The duration of the Professional Course for Bachelor of Science Examination in Applied Geology shall be 4 academic years.
3. There shall be a University Examination of I Professional at the end of 1st year, II Professional at the end of 2nd year, III Professional at the end of 3rd year and IV Professional at the end of 4th year.
4. A student of B.S. Applied Geology 1st Prof. will only be promoted to second Prof. if, he/she will pass qualify 50% courses and syllabi in the annual examination of B.S. 1st Prof. Examination. Same rule will be implemented to a students of B.S. 2nd and 3rd Prof. to promote to next Prof.
5. At suitable period of time during the each academic year, students will be taken out for geological field excursions for the duration and objectives prescribed in pertinent field work courses.
6. During the field work, every student will maintain a field notebook. He/she will carry out sampling, labeling and book entries. This notebook will be presented at the time of Viva Voce examination, which should be properly signed by the concerned teacher/s in the field.
7. Each student will be evaluated during the field work and he/she will be required to submit a Field Report as part of respective Examination. Field Report will be evaluated and *Viva-Voce* examination will be conducted jointly by the External and Internal Examiners to be appointed by the Board of Studies in Applied Geology.
8. In the 4th Professional class students will be required to opt a specialization, which will be offered to the student who has passed the I and II Professional exams securing at least 40% marks in each subjects and 50% aggregate marks in the both exams.
9. If the candidates for a Specialization Group are more than the available seats, the seats will be allocated on merit based on aggregate marks in 1st and 2nd Professional Exams.
10. During the 4th year, research for thesis including field and laboratory work, data acquisition, compilation and thesis writing will be accomplished alongwith the course work.
11. Till such time that the National Language is adopted officially, English will remain the medium of instructions and examination in the Institute of Geology.



ADMISSION TO M.PHIL. (2 YEARS) APPLIED GEOLOGY (SEMESTER SYSTEM)

Eligibility:

- M.Sc. Applied Geology / BS Applied Geology (04 years degree) or its equivalent, are eligible for admission in M. Phil. Applied Geology degree program.
- 1st Division / CGPA > 2.5 in M.Sc. Applied Geology / B.S. Applied Geology 04 years degree or its equivalent in the relevant subject form a recognized University (16 years of educations; 130 credit hours).
- All the candidates will have to appear for a written test and interview.
- Other conditions as per Punjab University admission rules.

Distribution of Seats:

Total:	Merit	Reserved
35	35	00

Merit Criteria

Basic Criteria and as per Clause 24 (b), Admission Regulations 2017-18, Page (8) An applicant shall be judged on the basis of the following merit criteria:

<i>Departmental Entry Test:</i>	<i>40%</i>
<i>Academic Qualification:</i>	<i>40%</i>
<i>Interview:</i>	<i>10%</i>
<i>Publication:</i>	<i>05%</i>
<i>Professional Experience:</i>	<i>05%</i>



COURSE STRUCTURE OF M.PHIL APPLIED GEOLOGY

GROUP-I: MINEROLOGY / PETROLOGY

Course Code:	Course Title	Credit hrs
FIRST SEMESTER		
Geol-501	Igneous Petrogenesis	03
Geol-502	Metamorphic Petrogenesis	03
Geol-503	Applied Geochemistry	03
Geol-504	Geology and technology of industrial rocks & minerals	03
SECOND SEMESTER		
Geol-505	Industrial Mineralogy	03
Geol-506	Ore Geology Mining and Processing	03
Geol-507	Metallogeny and Plate Tectonic	03
Geol-508	Advance Instrumental Techniques and Physical Properties	03

GROUP-II: MICROPALAEONTOLOGY / STRATIGRAPHY

Course Code:	Course Title	Credit hrs
FIRST SEMESTER		
Geol-509	Advance Stratigraphy	03
Geol-510	Micropaleontology	03
Geol-511	Sequence Stratigraphy	03
Geol-512	Applied Sedimentology	03
SECOND SEMESTER		
Geol-513	Petroleum Geology of Pakistan	03
Geol-514	Palynology	03
Geol-515	Basin Analysis	03
Geol-516	Tectonics of Pakistan	03
Geol-517	Applications of Remote Sensing and GIS in Oil Exploration	03



GROUP-III: PETROLEUM AND STRUCTURAL GEOLOGY

Course Code:	Course Title	Credit hrs
FIRST SEMESTER		
Geol-518	Petroleum Systems	03
Geol-519	Siliciclastic Sedimentology	03
Geol-520	Carbonate Sedimentology	03
Geol-521	Petroleum Structural Geology	03
SECOND SEMESTER		
Geol-522	Basin modeling and Sequence Stratigraphy	03
Geol-523	Application of Remote Sensing, GIS and GPS in Petroleum Geology	03
Geol-524	Advanced Reservoir Geology	03
Geol-525	Seismic Interpretation	03
Geol-526	Petroleum Geochemistry	03
Geol-527	Logging and Log Interpretation	03
Geol-528	Advanced Stratigraphy	03
Geol-529	Applied lab. Techniques and Research Methodology	03
Geol-530	Global Tectonics	03
Geol-531	Advanced Sedimentology	03

GROUP-IV: ENGINEERING GEOLOGY

Course Code:	Course Title	Credit hrs
FIRST SEMESTER		
GEOL-532	Soil Mechanics-I	03
GEOL-533	Engineering Geology-I	03
GEOL-534	Advanced Hydrology	03
GEOL-535	Rock Mechanics-I	03
SECOND SEMESTER		
GEOL-536	Engineering Geology-II	03
GEOL-537	Rock mechanics-II	03
GEOL-538	Hydrogeology and groundwater modeling	03
GEOL-539	Soil mechanics-ii	03



GROUP-V: GEOPHYSICS

Course Code:	Course Title	Credit hrs
FIRST SEMESTER		
Geol: 540	Geophysical Data Processing	03
Geol: 541	Advanced Seismic Interpretation	03
Geol: 542	Exploration Geophysics (Gravity, Magnetic, Electrical and Electromagnetic Methods)	04
Geol: 543	Geophysical Modelling	02
SECOND SEMESTER		
Geol: 544	Advanced Seismic Stratigraphy	03
Geol: 545	Well Seismic and Bore Hole Geophysics	03
Geol: 546	Reservoir Geophysics	03
Geol: 547	Rock Physics	03

ADMISSION TO Ph.D. APPLIED GEOLOGY PROGRAM

Eligibility

- i) M. Phil. or equivalent degree with CGPA = 3.0 after acquisition of 18 years education.
- ii) Distribution of Seats:
- iii) Total: Merit Reserved
- iv) 35 35 00

Merit Criteria

Basic Criteria and as per Clause 24 (b), Admission Regulations 2017-18, Page (8) An applicant shall be judged on the basis of the following merit criteria:

<i>Departmental Entry Test:</i>	<i>40%</i>
<i>Academic Qualification:</i>	<i>40%</i>
<i>Interview:</i>	<i>10%</i>
<i>Publication:</i>	<i>05%</i>
<i>Professional Experience:</i>	<i>05%</i>

Prescribed application forms duly filled in and supported by the attested copies of educational certificates / degrees be submitted to the office of Institute of Geology by the due date.

- Candidates waiting for the result of M. Phil. can apply and have to produce result before interview. Otherwise, they will not be considered for admission.



COURSE STRUCTURE OF Ph.D. APPLIED GEOLOGY

Course Code	Course Title	Credit hrs
Mineralogy / Petrology		
Geol-701	Aggregate of Pakistan	03
Geol-702	Geological Resources and Environment	03
Geol-703	Aggregates	03
Geol-704	Ore Geology, Mining and Processing	03
Geol-705	Mineral Deposits	03
Geol-706	Petrology	03
Geol-707	Metamorphic Petrology	03
Geol-708	Applied Geochemistry	03
Geol-709	Industrial Minerals of Pakistan	03
Stratigraphy / Micropaleontology		
Geol-710	Biostratigraphy	03
Geol-711	Event Stratigraphy	03
Geol-712	Applied Sedimentology	03
Geol-713	Exploration Petroleum Geology	03
Geol-714	Regional Tectonics	03
Geol-715	Paleoecology	03
Geol-716	Advance Sequence Stratigraphy	03
Geol-717	Seismic Stratigraphy	03
Petroleum and Structural Geology		
Geol: 718	Carbonate Sedimentology	03
Geol: 719	Applied Basin Analysis	03
Geol: 720	Seismic Stratigraphy	03
Geol: 721	Advance Seismic Interpretation	03
Geol: 722	Reservoir Geophysics	03
Geol: 723	Hydrocarbon Modeling	03



Course Code	Course Title	Credit hrs
Geol: 724	Geochemistry	03
Geol: 725	Isotope Geochemistry	03
Geol: 726	Paleoecology	03
Geol: 727	Hazards Analysis	03
Geol: 728	Tectonic Geomorphology	03
Geol: 729	Petrophysical Analysis	03
Geol: 730	Clastic Sedimentology	03
Geol 731	Biostratigraphy	03
Geol 732	Practical Structural Geology	03
Geol 733	Principles of Sequence Stratigraphy	03
Geol 734	Laboratory Techniques	03
Geol 735	Applied Structural Analysis	03
Geol 736	Seisnotectonics	03
Geol 737	Petroleum Economics and Management	03
Geol 738	Fluid Technology	03
Geol 739	Drilling Operation	03
Geol 740	Remote Sensing Mineralogy	03
Engineering Geology		
Geol-741	Geomechanics	03
Geol-742	Slope Stability: Types, Factors and Investigations	03
Geol-743	Mine Geology: Investigations & Exploration	03
Geol-744	Slope Stability: Evaluations and Mitigations	03
Geol-745	3D Geological Modeling	03
Geol-746	Underground Excavations & Support Assessment	03
Geol-747	Numerical Methods in Geomechanics	03
Geol-748	Mine Geology: Data Analysis & Resource Estimation	03
Geol-749	Mine geology: Surface and Subsurface Mining	03



Course Code	Course Title	Credit hrs
Geol-750	Slope Stability Hazard Zonation	03
Geol-751	Geohazards; Types and Factors	03
Geol-752	Geohazards; Zonation & Risk Assessment	03
Geol-753	Foundation Analyses and Design	03
Geol-754	Engineering Geology in Dams& Hydropower Projects	03
Geol-755	Seismicity and Seismotectonics of Pakistan	03
Geol-756	Geo Materials: Suitability Criteria	03
Geol-757	Construction Materials for Dams & Hydropower Projects	03
Geol-758	Construction Materials for Roads & Highways	03
Geol-759	Rock Blasting	03
Geophysics		
Geol: 760	Numerical Methods in Research	03
Geol: 761	Seismic Data Processing	03
Geol: 762	Seismic Data Interpretation	03
Geol: 763	Research Methodology	03
Geol: 764	Exploration Geophysics I (Gravity, Magnetic)	03
Geol: 765	Exploration Geophysics II (Electrical, Electromagnetic, GPR Methods)	03
Geol: 766	Advanced Rock Physics	03
Geol: 767	Advanced Seismic Stratigraphy	03
Geol: 768	Well Seismic	03
Geol: 769	Borehole Geophysics	03
Geol: 770	Advanced Reservoir Geophysics	03
Geol: 771	Engineering Geophysics	03
Geol: 772	Thermodynamics of Petroleum Fluids	03
Geol: 773	Seismic Hazard Analysis	03
Geol: 774	Solid State Geophysics	03



Course Code	Course Title	Credit hrs
Hydrogeology		
Geol: 775	Applied Hydrogeology	03
Geol: 776	Groundwater Engineering	03
Geol: 777	Environmental Hydrology	03
Geol: 778	GIS Applications to Hydrogeology	03
Geol: 779	Advance Quantitative Hydrology	03
Geol: 780	Groundwater Modeling	03
Geol: 781	Watershed Hydrology	03
Geol: 782	Water Resource Management	03

Fee Concession

Deserving students, possessing good academic record, are considered for full or half remission of the tuition fee. However, number of students to whom such a remission can be granted is limited to 10% of total strength of a class in the case of full or 20% in the case of half-fee concession

Merit Scholarship

A number of scholarships are available to meritorious students, i.e. HEC Need Base Students, PEEF Scholarships, Mora Scholarships, etc. Regional scholarships are granted by various district and divisional education departments after admission is finalized. Similarly the University awards a number of merit scholarships to students belonging to the Institute.

Needy Scholarship/Aid

The University of the Punjab awards a limited number of stipends to students deserving financial assistance on the recommendation of the Director. Qarz-e-Hasna is offered by many agencies. Needy scholarships are given by Government of Punjab from provincial Zakat Fund.

Medals/Grants

The Institute and a number of geological organizations offer medals to students who qualify various examinations with distinction. The students of the institute won the travel grants to participate various international conferences/workshops and courses in different countries.

Research Fellowships

Research Fellowships may become available from University of the Punjab, Higher Education Commissions and the Pakistan Science Foundation after approval of a research program proposed by the students including Ph. D. Thesis work.

Hostel Accommodation

The University of the Punjab provides hostel accommodation to a fairly large number of students. Placement in the University hostel is arranged on merit basis by the Chairman Hall council on the recommendation of the Director.



Extra-curricular Activities

Extra-curricular activities are as important as the curricular activities. The students' society in the Institute makes many arrangements for games, sports, debates and get-together functions. This creates healthy atmosphere in the Institute and strengthens relations between students and teachers.

Sports and Games

Sports play an important role in the life of the students in conditioning their mental and physical make up. Students willing to take part in games and sports can find many opportunities to do so. Facilities to participate in University and Faculty Sports are available, while representations are also drawn for national level sports.

Student's Magazine

The student's magazine "Al-Arz" is published every year under student's editorship. The magazine is based on contributions by the students including some from teachers and old students as well. It is distributed free to students.

Student Chapter of Professional Organizations

Various international and national organizations such as Society of Exploration Geophysicists (SEG) of U.S.A., Pakistan Geophysical Network (PGN), Pakistan Association of Petroleum geoscientists (PAPG) established their student's chapters at the Institute to help and groom the students professionally.



Medical Facilities

Free medical facilities are available to students at the Quaid-I-Azam and Allama Iqbal Campus, including the dispensary round the clock. In case of serious illness, emergency hospitalization can be arranged under advice of the Medical Superintendent. First aid boxes are provided to students during their fieldwork and final year field projects.

Alumni Association, Institute of Geology Punjab University

Steps are being taken to establish the Alumni Association of the Institute. This will comprise of all the old students since inception of this oldest seat of geological learning in the country, included also will be staff members and research scholars who have been associated as well as those who are actively working in the Institute. The association will also publish an annual bulletin comprising of news regarding the Institute and personal news of its members including their achievements. It will also publish a Directory of old students, staff and research workers. The association will assist students of the Institute in their higher studies and employment problems. All concerned are required to contact office of the Institute.



EMPLOYMENT ORGANIZATIONS

1. Educational Institutes, Universities and Colleges.
2. Pakistan Atomic Energy Commission.
3. Geological Survey of Pakistan.
4. Oil and Gas Development Corporation Limited.
5. Hydrocarbon Development Institute of Pakistan.
6. National Engineering Services of Pakistan.
7. Water and Power Development Authority (WAPDA).
8. Meteorological Department of Pakistan
9. Pakistan Mineral Development Corporation.
10. Punjab Mineral Development Corporation
11. Water & Sanitation Agency L.D.A.
12. Road Research Laboratories.
13. Azad Kashmir Mineral Development Corporation.
14. Pakistan Council for Scientific and Industrial Research.
15. Soil Survey of Pakistan.
16. Gemstone Corporation of Pakistan.
17. Resource Development Corporation.
18. Frontier Works Organization.
19. Pakistan Steel Mill.
20. State Cement Corporation
21. Ministry of Natural Resources
22. Museum of Natural History.
23. Industrial Development Finance Corporation.
24. Regional Development Bank of Pakistan.
25. EMCO
26. Ravi Glass
27. Pakistan Oil Field.
28. Oxidental Pakistan.
29. Pakistan Petroleum Ltd.
30. Union Texas of Pakistan.
31. Associated Consulting Engineers.
32. Directorate of Land Reclamation.
33. Punjab Land Utilization Authority.
34. Dams Safety Organization.
35. Hydrogeology (WAPDA).
36. Hydrogeology Directorate.
37. Hydrology and Research.
38. Pakistan Council of Research in Water Resources.
39. Cone Drill.
40. Bone Master.
41. Rock Well.
42. Schlumberger International.
43. Mathtach International.
44. LASMO Oil Pakistan Limited.
45. Land Mark Resources
46. Fugro
47. Bureau of Geophysical Prospecting (BGP)

