

INSTITUTE OF ENERGY & ENVIRONMENTAL ENGINEERING
FACULTY OF ELECTRICAL, ENERGY & ENVIRONMENTAL ENGINEERING
UNIVERSITY OF THE PUNJAB



Prospectus
Fall 2023



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

CONTENTS

Message from Worthy Vice-Chancellor	1
Message from the Dean and Director	2
1.0 Faculty	4
2.0 Offered Postgraduate Academic Program for Fall 2022 Admissions	7
2.1 Vision of University	7
2.2 Mission of the University	7
2.3 Vision of the Institute	7
2.4 Mission of the Institute	7
2.5 Introduction of the Institute	8
3.0-A M.Sc. Energy & Environmental Engineering	11
Program Introduction	11
Program Objectives	11
Admission Rules and Regulations	11
Eligibility Criteria	11
Program Structure	12
3.0-B M.Phil. Coal Technology	14
Program Introduction	14
Program Objectives	14
Admission Rules and Regulations	14
Eligibility Criteria	14
Program Structure	15
3.0-C Ph.D. Energy & Environmental Engineering	17
Program Introduction	17
Program Objectives	17
Admission Rules and Regulations	17
Eligibility Criteria	17
Program Structure	19
4. General Rules and Regulations	20
5. Hostel Accommodation	20
6. Medical Facilities	20
7. Scholarship Facilities	20

8. Industrial Tours.....	20
9. Factory Training	20
10. Institute’s Role In Building Community	21
11. Co-Curricular Activities.....	21
11.1 Annual Sports Festival – (2020).....	21
11.2 Symposium on Energy and Environment – (13 December 2019).....	21
11.3 Seminar on The Smog and It’s Mitigation – (15 November 2019).....	22
11.4 Seminar on Serat e Nabi (SAW) – (8 November 2019).....	22
12. Rules Relating To Discipline	23
13. Training, Research And Analytical Facilities.....	25
14. Office of Research Innovation and Commercialization (ORIC).....	27
15. Institute-Industry Linkage/Collaboration	27
Disclaimer.....	29

Message from Worthy Vice-Chancellor

Being the largest and the oldest varsity in Pakistan, University of the Punjab was established in historically and culturally alive city of Lahore in 1882 and since then it has provided conducive environment to the students for achieving academic excellence. University happens to be the first choice for seeking admission because of quality degrees, manageable tuition fees and amiable environment. University is committed to generate new knowledge at technological forefronts and produce adequately skilled manpower in cutting edge technologies required by indigenous industries. Institute of Energy & Environmental Engineering (former Centre for Coal Technology) has already acquired excellence in terms of providing manpower and technical expertise to local coal-based industries, which can be evidenced from the fact that 89% of graduates are serving in indigenous industry as well as abroad including power generation, cement production and chemical industries.



Institute of Energy & Environmental Engineering has been upgraded from the Centre for Coal Technology through the Planning Commission grant of Rs. 976.53 Million. This Institute is on its way to become the leading academic Institution of Pakistan in the field of Energy & Environmental Engineering, as the proposed courses and majority of the approved equipment do not exist anywhere in Pakistan. A number of programs will be offered in disciplines of energy engineering, petroleum and gas processing engineering, environmental engineering, energy economics and policy, environmental law, energy auditing and conservation. It will not only provide professional engineers and technologists to the country in these areas but also provide policy guidelines to the Government in Energy, Economic, Strategy, Energy Security and Climate Change. Additionally, the institute will be able to payback its economic cost within 10-12 years and thousands of trained professionals, engineers, scientists, research innovation, savings through indigenous solutions, consultancy to the Government & Private Enterprises and pollution control are free of cost expected dividends of the project.

The Institute is being run under the Faculty of Engineering and Technology. The faculty comprises of Institute of Chemical Engineering & Technology, College of Engineering & Emerging Technologies, Institute of Quality and Technology Management and Department of Textile Engineering which offer various engineering courses at graduate and post-graduate levels.

The University is committed to provide best possible facilities in terms of faculty staff, laboratories, libraries and environment for R&D activities leading to higher degrees. I hope that the talented candidates will be joining the engineering degree courses with the strong commitment to keep up the tradition of this Institution and help maintain the flag of the University high in the sky.

Prof. Dr. Khalid Mahmood
VICE CHANCELLOR

Message from the Dean and Director

This Institute was established as Centre for Coal Technology with the funds worth of Rs. 13.408 million and Rs. 34.390 million in the years of 2004 & 2006 from HEC and further upgraded with HEC grant of Rs. 182.79 million in the year 2015. Later, this Centre was then transformed into Institute of Energy & Environmental Engineering in 2020, under PSDP project entitled as, "Strengthening and Upgradation of Academic and Research Programs at University of the Punjab" with the grant of Rs. 976.530 million. This Institute can be claimed as one of the leading Institutes of Energy Engineering in South Asia offering state of the art analytical and pilot scale experimental facilities under one roof and having strongest vibrant faculty.



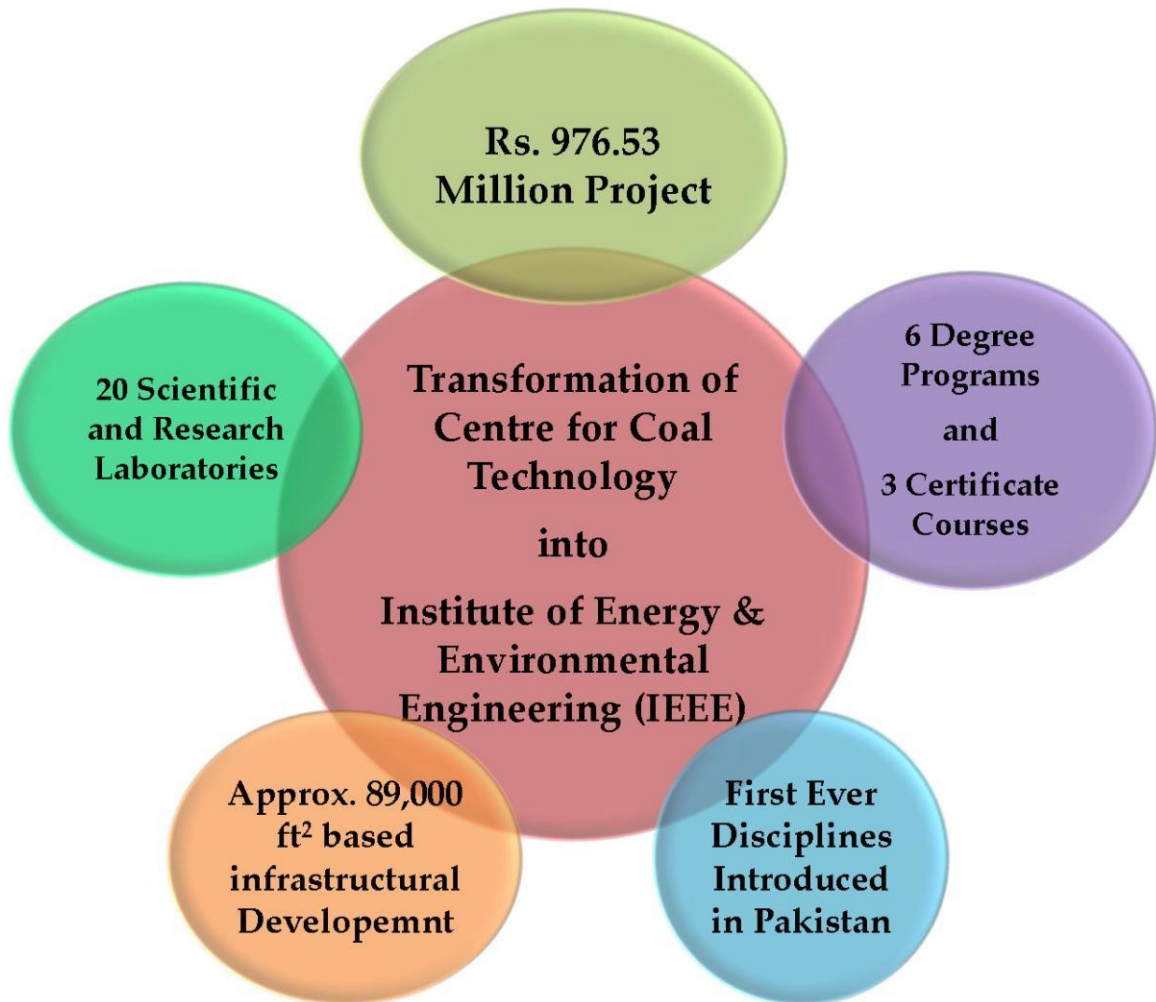
The Institute is providing technical feasibility expertise to the Government of Punjab for the establishment of more than 15 power projects at national level. In addition to evaluation of technical feasibility studies, the Institute is providing testing facilities to more than 200 local industries. The Institute is also providing free consultancy services to the private enterprises for, Gasification, Coal cleaning/Coal fired electricity generation/Domestic utilization of coal, Substitution of furnace oil/natural gas by coal in the industrial sector, transfer of technology from the developed/developing countries to Pakistan, spread of knowledge, experience and skill to the public within the country by integrating results on indigenous energy sources.

The Institute has planned to launch academic programs of BSc (Engg.) Energy Engineering, BSc (Engg.) Petroleum & Gas Processing Engineering, BSc (Engg.) Environmental Engineering, MSc Energy Economics & Policy, PhD Energy Engineering, Post Graduate Diploma in International Disputes Settlement, Certificate Courses in Energy Auditing & Conservation, International Certificate Courses in Industrial Environment Auditing, in addition to already running programs of M.Sc. Coal Technology, M.Phil. Coal Technology, MSc (Engg.) Energy and Environmental Engineering programs

With the successful launch of these programs, the Institute would then produce highly skilled and trained manpower in the disciplines of energy engineering, petroleum and gas processing engineering, environment engineering, energy economics and policy, environmental law, energy auditing and conservation. It will not only provide professional engineers and technologists to the country in these areas but also provide policy guidelines to the Government in Energy, Economics, Strategy, Energy Security and Climate Change.

Prof. Dr. Hamed Sattar
DEAN & DIRECTOR

Highlights of Institute of Energy & Environmental Engineering



1.0 Faculty

Professors

- 1. Dr. Hamed Sattar (CHEM-4669) (Director)**
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (University of Leeds, UK), P.E.
- 2. Dr. Mahmood Saleem (CHEM-2544) (Former Director)**
Vice Chancellor Mir Chakar Khan Rind University DG Khan
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (Graz University of Technology, Austria), P.E.
- 3. Dr. Shahid Munir (CHEM-4667) (Former Director)**
Chairman Punjab Higher Education Commission
Ex-Vice Chancellor University of Jhang
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering, MBA
Ph.D. (University of Leeds, UK), P.E.



Associate Professors

- 1. Dr. Syed Sheraz Daood (CHEM-4668)**
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (University of Leeds, UK), P.E.



Assistant Professors

- 1. Dr. Rizwan Haider**
M.Sc. Coal Technology
Ph.D. Biotechnology (QAU/NIBGE)
Post Doc (University of Wyoming, USA)
- 2. Dr. Hassan Zeb (CHEM-7001)**
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
PhD (Sungkyunkwan University, South Korea), R.E.
- 3. Dr. Muhammad Sarfraz Akram (CHEM-7062)**
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering, MBA
Ph.D. (University of the Punjab, Pakistan), R.E.
- 4. Dr. Muhammad Zafar (CHEM-6612)**
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (Chonnam National University, South Korea), R.E.



Lecturers

1. **Engr. Iqra Aziz (CHEM-18809)**
B.Sc. (Engg.) Chemical Engineering
M.Phil. Coal Technology, R.E.



2. **Engr. Abuzar Ahsan (CHEM-11878)**
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering, R.E.



Lab Engineers

1. **Engr. Muhammad Saif Ullah (ELECT-38090)**
B.Sc. (Engg.) Electrical Engineering,
M.Sc. (Engg.) Energy & Environmental Engineering, R.E.



Visiting Faculty

- 1. Prof. Dr. Shafqat Nawaz**
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (University of Leeds, UK)
- 2. Dr. Naseeruddin Sheikh**
B.Sc. Hons., M.Sc. (Chem.)
Ph.D. (University of British Columbia, Canada)
- 3. Dr. Khurram Shahzad**
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (Chemical Engineering)
Post Doc. (McGill University, Canada)
- 4. Dr. Sumaira Kanwal**
B.Sc., M.Sc. (Coal Technology)
M.Phil. (Environmental Science)
Ph.D. (University of the Punjab, Pakistan)
- 5. Engr. Majid Ali Baig**
B.Sc. (Electrical Engineering)
M.Sc. (Electric Power and Energy Engineering)
- 6. Engr. Kashif Habib**
B.Sc. (Engg.) Electrical Engineering
M.Sc. (Electrical Engineering)
- 7. Engr. Sohail Moghal**
Master of Business Administration, LUMS, Pakistan
- 8. Dr. Muhammad Ali**
Ph.D. (National College of Business Administration & Economics,
Pakistan/University of British Columbia, Canada)
- 9. Dr. Ayyaz Muhammad**
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D (Universiti Teknologi Petronas, Malaysia)

2.0 Offered Postgraduate Academic Program for Fall 2022 Admissions

Degree Programs	Duration
M.Sc. (Engg.) Energy & Environmental Engineering (<i>Taught and Research</i>) (Self-Supporting Program/Evening)	2 yrs.
M.Phil. Coal Technology (Self-Supporting Program/Evening)	2 yrs.
Ph.D. Energy & Environmental Engineering (Regular Program/Morning)	3 yrs.

2.1 Vision of University

“University of the Punjab intends to be a leading public university in providing affordable educational opportunities to develop scientific, socio-cultural, economic and political leadership, through learner-centered teaching and research, while strengthening our identity at National and International level.”

2.2 Mission of the University

“Our mission is to provide a holistic education as such an approach has a two-fold benefits. The first is that young people are nurtured to be sensitive, tolerant, humane and capable of thinking in a creative and critical way. The second is, that armed with a sense of history and equipped with knowledge and expertise, the graduates whom we send out into the world are in a better position to develop their leadership potential and make a positive contribution to the public life. We hope that understanding as they do, their role in the wider community of human-kind and responsible to it, their action and attitudes will reflect their education.”

2.3 Vision of the Institute

To be a world class engineering institute in the domain of energy and environment recognized for excellence in education, innovation and entrepreneurship leading to sustainable development of the country.

2.4 Mission of the Institute

The mission of the Institute is, to provide a high-quality learning experience to produce Energy & Environmental Engineers to meet the human resource needs of the country, and to develop technical skills in design, synthesis, optimization and operations that will equip graduates in assuming leadership positions in industry, education, research and services.

2.5 Introduction of the Institute

This Institute was established as Centre for Coal Technology with the funds worth Rs. 13.408 million and Rs. 34.390 million in the years 2004 & 2006 from HEC and further upgraded with HEC grant of Rs. 182.79 million in the year 2015. Later, this Centre was transformed into Institute of Energy & Environmental Engineering in 2020, under Public Sector Development Project (PSDP) project entitled as, "Strengthening and Upgradation of Academic and Research Programs at University of the Punjab" with the grant of Rs. 976.530 million. This Institute can be claimed as one of the leading institutes of energy engineering in south asia offering state of the art analytical and pilot scale experimental facilities under one roof and having strongest vibrant faculty.

Previously, the Institute has provided technical feasibility expertise to the Government of Punjab for the establishment of following power projects at national level:

1. Punjab Power Development Company, Government of the Punjab, 660×2 MW coal based power plant at Qadar Abad - Sahiwal District, Punjab.
2. M/s Electro Power Generation Pvt. Ltd. 50 MW coal based power plant at Kalar Kahar, Distt. Chakwal.
3. M/s Saba Power Generation Company Pvt. Ltd. 50 MW coal based power plant at Kattha Sugral, Distt. Khushab
4. M/s Noble Power Generation Company Pvt. Ltd. 50 MW coal based power plant at Mauza Dharabi, Tehsil Tala Gang, Distt. Chakwal.
5. M/s Malakwal Power Pvt. Ltd. 50 MW coal based power plant at Vareena Distt. Mandi Bahuddin.
6. Punjab Power Development Company, Government of the Punjab, 110 MW coal based power plant near Industrial Estates, Sundar, Lahore.
7. Punjab Power Development Company, Government of the Punjab, 110 MW coal based power plant near M-3 Industrial City, Faisalabad.
8. 2×660 MW coal based power plant at Rahim Yar Khan by Nishat group and Shanghai Electric Company, China
9. 2×660 MW coal fired power project at Balloki, Kasur by M/s. China Gezhouba Group Co., Ltd.
10. Punjab Power Development Company Limited, Government of the Punjab, 150 MW coal based power plant at Sialkot
11. Punjab Power Development Company Limited, Government of the Punjab, 150 MW coal based power plant at Faisalabad
12. Punjab Power Development Company Limited, Government of the Punjab, 150 MW coal based power plant at Multan
13. Punjab Power Development Company Limited, Government of the Punjab, 150 MW coal based power plant at Lahore
14. 30MW waste to energy power plant at Lakhodair Site Lahore undertaken by Lahore Waste Management Company (LWMC)

In addition to evaluation of technical feasibility studies, the Institute provided testing facility to the Punjab Government for the evaluation of Punjab coal reserves. The Institute is also providing free consultancy services to the private enterprises for the following purposes:

- Gasification
- Coal cleaning/Coal fired electricity generation/Domestic utilization of coal
- Substitution of furnace oil/natural gas by coal in the industrial sector
- Transfer of technology from the developed/developing countries to Pakistan
- Spread of knowledge, experience and skill to the public within the country by integrating results on indigenous energy sources

The Institute is also providing analytical testing services at the cheapest rates to the industry. So far more than 200 companies have benefitted from testing. The human resources produced by the Institute is fully capable to handle power plants and their associated laboratories that are being setup through CPEC.

Furthermore, with the success of offered academic programs, the Institute would then produce highly skilled and trained manpower in the disciplines of energy engineering, petroleum and gas processing engineering, environment engineering, energy economics and policy, environmental law, energy auditing and conservation. It will not only provide professional engineers and technologists to the country in these areas but also provide policy guidelines to the Government in Energy, Economics, Strategy, Energy Security and Climate Change.

**M.Sc. (Engg.) Energy &
Environmental Engineering**
(By Taught and Research)

3.0-A M.Sc. Energy & Environmental Engineering

Program Introduction

This program will provide an opportunity to graduate engineers to enhance their in-depth knowledge and multidimensional skills in energy and environmental engineering domain to advance in their profession or preparing them to pursue higher research degree programs.

Program Objectives

The objectives of this program are as follows;

1. To attain higher leadership positions in energy sector, academic and research organizations, marketing and sales companies, and government departments
2. To secure place for higher research degree at international/national institutions
3. To become an entrepreneur

Admission Rules and Regulations

Regulations relating to admission, registration and examination for MS./M. Phil., and Ph.D. degrees can be found at the following link of Doctoral Program Coordination Committee.

<http://pu.edu.pk/dpcc/downloads/Revised-MS-MPil-PhD-Rules.pdf>

Eligibility Criteria

Besides the rules and regulations framed by DPCC, 16 years of education in the following degree holders along with valid PEC registration are eligible to apply;

- Energy and Environmental Engineering; Energy Engineering; Environmental Engineering; Thermal Engineering; Thermal Energy Engineering; Chemical Engineering; Mechanical Engineering; Electrical Engineering; Mechatronics & Control Engineering; Power Engineering; Fuel Engineering; Petroleum & Gas Engineering; Systems Engineering; Process System Engineering; Renewable Energy Engineering; Polymer Engineering; Metallurgy & Materials Engineering; Sustainable Energy Engineering; Renewable & Sustainable Engineering; Electrical Energy System Engineering; Mechatronics Engineering; Polymer & Petrochemical Engineering; Nuclear Engineering; Thermal System Engineering
- GRE-Subject Test (conducted by the university in the discipline of admission.) with minimum 50% marks

Duration of the Program	Allocation of Seats
Semester: 4	Merit: 35
Years: 2	Reserve: 00
Credit Hours: 30	Total: 35

Program Structure

#	Code	Course Title	Course Type	Pre-requisite	Cr. Hr. (T)	Cr. Hr. (L)	Cr. Hr. (Total)
Semester I							
1	EEE 511	Fundamentals of Energy & Environmental Engineering	Core	NA	3	0	3
2	EEE 512	Fuel Processes Engineering	Core	NA	3	0	3
3	EEE 513	Research Methods and Data Analysis	Basic	NA	3	0	3
4	EEE 514	Recycling Engineering	Major	NA	3	0	3
Total Credit Hours							12
Semester II							
1	EEE 521	Energy Management & Conservation	Core	NA	3	0	3
2	EEE 522	Advanced Analytical Techniques	Basic	NA	3	0	3
3	EEE 523	Advanced Renewable Energy Systems Engineering	Core	NA	3	0	3
4	EEE 524	Project Management for Engineers	Major	NA	3	0	3
Total Credit Hours							12
Semester III							
1	EEE 631	Research Thesis*			0	3	3
	EEE 632	Electives-I**			2/4**	0	2/4**
Total Credit Hours							3 2/4**
Semester IV							
1	EEE 641	Research Thesis			0	3	3
	EEE 642	Electives-II**			2/4**	0	2/4**
Total Credit Hours							3 2/4**
Grand Total Credit Hours						24+6 = 30	

List of Electives-I and –II.

- A. Thermochemical Conversion Processes
- B. Solar Cell Energy Engineering
- C. Power Transmission
- D. Global Warming & Climate Change
- E. Policies & Ethics
- F. Energy Exergy Economics
- G. Occupational Health, Safety & Environment
- H. Environmental Management

***Carryover to next semester**

****The students of taught course may be given an option to opt at least 2 and maximum 4 credit hours in each 3rd and 4th semester from elective subjects in lieu of research thesis. The said scheme of study will appear in transcript as M.Sc. (Engg.) Energy & Environmental Engineering (By Taught Course).**

M.Phil. Coal Technology

3.0-B M.Phil. Coal Technology

Program Introduction

This unique program which is only being offered at IEEE across the country is designed to efficiently utilize huge coal reserves available in the country. It covers every possible aspect of clean, advanced, and effective coal utilization not only in terms of providing trained workforce but also it provides a strong base to prospective graduates to engage themselves in diversified research activities for clean energy generation from coal. This program also acts as a bridge for our students of M.Sc. Coal Technology to pursue much needed higher studies in clean coal usage for energy generation and chemical production. Curriculum of the program is emphatically designed to nourish the exploitation of indigenous coal reserves and to perform advanced research in the field.

Program Objectives

The graduates of M.Phil. Coal Technology are expected to comprehend with the following program objectives:

1. To apply acquired knowledge to address technical and feasibility of coal-based processes
2. To develop innovative ideas for technological advancements in the field of coal technology
3. To work effectively as team member or as team leader with improved interpersonal and technical skills

Admission Rules and Regulations

Regulations relating to admission, registration and examination for MS./M. Phil., and Ph.D. degrees can be found at the following link of Doctoral Program Coordination Committee.

<http://pu.edu.pk/dpcc/downloads/Revised-MS-MPil-PhD-Rules.pdf>

Eligibility Criteria

Candidates with following terminal degrees are eligible to apply:

- M.Sc. Coal Technology, M.Sc. Chemistry, M.Sc. Environmental Science, M.Sc. Polymer Technology, B.Sc./M.Sc. Geology, B.Sc. Chemical Engineering, B.Sc. Metallurgy and Material Engineering, B.Sc. Petroleum and Gas Engineering, B.Sc. Environmental Engineering, B.Sc. Mining Engineering, B.Sc. Energy Engineering, B.Sc. Polymer Engineering, B.Sc. Industrial Engineering, B-Tech. (Hons.) in Chemical / Metallurgy / Mining / Petroleum & Gas / Mechanical / Polymer.
- GRE-Subject Test (conducted by the university in the discipline of admission.) with minimum 50% marks

<u>Duration of the Program</u>	<u>Allocation of Seats</u>
Semester: 4	Merit: 25
Years: 2	Reserve: 00
Credit Hours: 30	Total: 25

Program Structure

Semester-I				
Course Title	Course Code	Lecture Hours	Lab Hours	Credit Hours
Coal Chemistry and Processing Technology	MCT 511	3	-	3
Coal Characterization and Comminution	MCT 512	3	1	4
Thermochemical Conversion Processes	MCT 513	3	-	3
Research Methodology	MCT 514	2	-	2
Total Credit Hours				12
Semester-II				
Course Title	Course Code	Lecture Hours	Lab Hours	Credit Hour
Clean Coal Technologies	MCT 521	3	-	3
Combustion Residues and its Applications	MCT 522	3	-	3
Coal Fired Power Generation	MCT 523	3	-	3
Advanced Coal Technologies	MCT 524	3	-	3
Total Credit Hours				12
Semester-III				
Course Title	Course Code	Lecture Hours	Lab Hours	Credit Hour
Research Thesis*	MCT 631	-	9	3
Total Credit Hours				3
Semester-IV				
Course Title	Course Code	Lecture Hours	Lab Hours	Credit Hour
Research Thesis*	MCT 641	-	9	3
Total Credit Hours				3

*Carry over to next semester

Note: Topics of research for MPhil in Coal Technology will be related to issues/challenges associated with coal utilization.

Ph.D. Energy & Environmental Engineering

3.0-C**Ph.D. Energy & Environmental Engineering****Program Introduction**

This program will develop highly skilled human resource equipped with in-depth knowledge and multidimensional skills which would serve as research leaders for innovation and advancement of knowledge to develop technologies for improving the existing energy infrastructure and sustainable energy supplies based on indigenous energy resources.

The Doctor of Philosophy Degree is awarded in recognition of significant and original contribution to the existing pool of knowledge in the field of Energy Engineering.

The candidate must pass the taught courses (18 Credit Hours) followed by Comprehensive Examination and submit written thesis as proof of his contribution to the pool of knowledge, which is evaluated by foreign experts, as per university policy. The candidate should be able to:

- i. Suggest new areas/dimensions/horizons for research.
- ii. Perform independent investigations.
- iii. Understand and apply the research outputs.
- iv. Correlate and communicate the findings.

Program Objectives

The objectives of this program are as follows:

1. Training and development of highly skilled human resources for designing, organizing, and managing innovative basic and applied research projects in the areas of energy and environmental engineering.
2. Development of methodological rigor in the candidates for interpretation and dissemination of results originating from multifaceted research scenarios.
3. Enabling the candidates to take a leading role in a variety of institutional settings, including varsities, research labs, R & D framework of industry, and think tanks.

Admission Rules and Regulations

Regulations relating to admission, registration and examination for MS./M. Phil., and Ph.D. degrees can be found at the following link of Doctoral Program Coordination Committee.

<http://pu.edu.pk/dpcc/downloads/Revised-MS-MPil-PhD-Rules.pdf>

Eligibility Criteria

- 18 years education in; Energy and Environmental Engineering, Energy Engineering, Environmental Engineering, Thermal Power Engineering, Thermal Energy Engineering, Chemical Engineering, Mechanical Engineering, Electrical Engineering, Mechatronics & Control Engineering, Power Engineering, Fuel Engineering, Petroleum & Gas Engineering, Energy Systems Engineering, Process System Engineering, Renewable Energy Engineering, Polymer Engineering,

Metallurgy & Materials Engineering, Sustainable Energy Engineering, Renewable & Sustainable Engineering, Electrical Energy System Engineering, Mechatronics Engineering, Polymer & Petrochemical Engineering, Nuclear Engineering, Thermal System Engineering, Coal Technology*.

- GRE-Subject Test (conducted by the university in the discipline of admission) with minimum 60% marks

***The candidate having terminal degree of M.Phil. Coal technology must have valid PEC registration.**

Duration of the Program	Allocation of Seats
Semester: Minimum 6, Maximum 10	
Years: 3 Years Minimum & 5 Years Maximum (As Per Academic Council Decision, held on 13th December 2019)	Merit: 15 Reserve: 00
Credit Hours: Course Work (18 Credit hours during 1st year) + Thesis	Total: 15

Program Structure

#	Code	Courses	Course Type	Pre-requisite	Lecture Credit Hours	Lab Credit Hours	Total Credit Hours
Semester I							
1	EE 711	Research Methodology and Data Analysis	Core	Nil	3	0	3
2	EE 712	Advanced Instrumental and Analytical Techniques	Core	Nil	3	0	3
3	EE 713	Elective Course-I	Elective	Nil	3	0	3
	EE 713A	Combustion Engineering					
	EE 713B	Advanced Thermochemical Conversion Processes					
	EE 713C	Bio-based Energy Systems					
	EE 713D	Carbon Capture and storage					
4	EE 714	Research Seminar-I*	Any other	Nil	0*	0	0*
Total Credit Hours							09
Semester II							
1	EE 721	Modeling and Simulation of Energy Systems	Core	Nil	3	0	3
2	EE 722	Advances in Energy and Environmental Engineering	Core	Nil	3	0	3
3	EE 723	Elective Course-II	Elective	Nil	3	0	3
	EE 723A	Advances in Energy Materials					
	EE 723B	Supercritical Fluid Technology					
	EE 723C	Photovoltaic Solar Energy					
	EE 723D	Advances in Wind Energy					
4	EE 724	Research Seminar-II*	Any other	Nil	0*	0	0*
Total Credit Hours							09
Total Course Work Credit Hours (Semester I to II)							18

* Students will present/attend research seminar during their 1st and 2nd semesters

4. General Rules and Regulations

General rules and regulations pertaining to M.Sc. and PhD programs are available at the website of Doctoral Program Coordination Committee (DPCC).

<http://pu.edu.pk/dpcc/downloads/Revised-MS-MPil-PhD-Rules.pdf>

5. Hostel Accommodation

The University of the Punjab provides hostel accommodation to a fairly large number of students. Placement in University hostels is arranged on a priority basis and only for regular students (not for self-supporting/evening program) by the Chairman Hall Council, Quaid-e-Azam Campus, Lahore on the recommendation of the Head of Department.

6. Medical Facilities

Services of the University Medical Officers are available to the students during working hours. The University maintains a Health Centre at the Campus where facilities for the treatment of outdoor patients exist. In case of serious illness and emergency, hospitalization can be arranged under the advice of the C.M.O./M.O. The University Medical Officer may conduct periodical check-up of the students.

7. Scholarship Facilities

Various types of scholarships are available to the students of regular programs (Morning) not only to acknowledge the academic performance of the students but also to fulfill their financial needs. These scholarships include;

Merit Scholarships: These scholarships are awarded each year to the students.

Needy Scholarships: These scholarships are awarded each year to the students on the basis of their financial background. Students need to apply for these scholarships to appear before the scholarship committee.

PEEF Scholarships: These scholarships are awarded each year to the students on the basis of criteria set by the Punjab Government. These scholarships continue for the two years provided that the students maintain its required CGPA.

8. Industrial Tours

Students of the Faculty are provided an opportunity to enhance their technical knowledge and broaden their outlook by undertaking tours of factories located all over Pakistan. The expenditure of these tours is borne partly by the University.

9. Factory Training

In order to gain practical experience in an industrial organization, job training is considered essential for the students. It also goes a long way in familiarizing the students with actual conditions in factories and various complex factors involved in

their management and operation. Practical training for students is arranged by the Director / Principal / Chairman. The University shall not be responsible in the event of injury, damage or loss to the students during the course of attendance or training in or outside the University.

10. Institute's Role In Building Community

Under the guidelines of National Accountability Bureau (NAB), a Character-Building Society (CBS) has been established which is actively arranging events on different occasions to provide healthy and positive environment among the students. The main objectives of the CBS are to create a resilient environment for the social evils like bribery, nepotism, favoritism, cheating and fraud by building an over mindset which has zero tolerance against these crimes.

The purpose of these societies is to provide students a platform where with the progression in their semesters, they could learn how to work as team member, independently, and as a team leader.

11. Co-Curricular Activities

Apart from academics, co-curricular activities for the students are regularly arranged at the Institute to inculcate social and intellectual skills, moral values, leadership qualities, personality progress and character demand. Highlights few recently conducted activities is discussed in next sections.

11.1 Annual Sports Festival – (2020)

Every year during the spring season, sports festival is arranged by the Institute to encourage the students for their active participation in sports. Different sports activities like cricket matches, football, luddo, hockey, table tennis, badminton and chess are organized among students and faculty members.



11.2 Symposium on Energy and Environment – (13 December 2019)

The aim of this symposium was to provide a platform for researchers, academicians, scientists, policy makers and industrialists to realize the current prospect of national challenges for energy and environment and their proposed indigenous solutions. The representatives from all sectors were invited to share their views, knowledge, experience and scientific achievements in the area of effective and efficient utilization

of conventional to renewable fuels/energy and advancement to mitigate the environmental pollution.



11.3 Seminar on The Smog and It’s Mitigation – (15 November 2019)

As a pioneer and a stakeholder on environment related issues, the Institute has organized an awareness seminar on the understanding of smog phenomenon, reasons, issues, affects on human health and its mitigation techniques. The honorable guest speaker, Mr. Naseem Ur Rehman, Director EIA Government of the Punjab, shared his valuable thoughts on understanding smog in populated regions like Lahore and its suburbs. He has also discussed Government’s policies, plans and actions to combat this environmental hazard in coming years. Students gained a lot of information from this seminar and asked many questions from the speaker to further clarification.



11.4 Seminar on Serat e Nabi (SAW) – (8 November 2019)

On the occasion of birth of our Holy Prophet (SAW) during the month of Rabi-ul Awal, a seminar on Seerat Un Nabi was conducted by the Character-Building Society (CBS) of the Institute. Chief Guest of the event, Prof. Dr. Zahir Munir Amir, who is a well known scholar and a Professor at Oriental College, University of the Punjab, educated the audience regarding the life of our Holy Prophet (SAW) and how his life is a role model and a solution of all the problems that we are facing as Ummah.



12. Rules Relating To Discipline

No student shall:

- (i) utter, do, or propagate anything repugnant to Islam within and outside the precincts of the University/Institute/College/Department,
- (ii) say or do anything which might adversely affect the honor and prestige of Pakistan or University and Teachers,
- (iii) smoke in the Classroom, Laboratory, Workshop, Library and Examination Hall,
- (iv) form, or associate with an Organization/Society/Club, or any other body, promoting caste distinctions and inciting parochial/linguistic/regional feeling,
- (v) organize, or hold any function within the precincts of the University except in accordance with the prescribed rules and regulations,
- (vi) collect money or receive donations or pecuniary assistance for or on behalf of the University or any University Organization except with the written permission of the competent authority,
- (vii) stage, incite, or participate, in a walkout, strike or any other form of agitation which might create or is likely to create law and order problem for the University and affect or is likely to affect its smooth functioning,
- (viii) indulge in immoral activities, use indecent language, wear immodest dress, make indecent remarks, jokes or gestures or behave in an improper manner,
- (ix) cause disturbance to others,
- (x) keep or carry weapons, narcotics, immoral or subversive literature,
- (xi) disturb peace and tranquility of the Institution/College/Department,
- (xii) use in salutary or abusive language or resort to violence against a fellow student or employee of the University.
- (xiii) use mobile phone in the classroom and examination hall

Disciplinary action by the Principal of a Constituent/Affiliated College/Chairman of a University Teaching Department/Director of an Institute/Discipline Committee/

Council against the student/s may be taken in one or more of the following forms depending upon the severity of the offence:

- (i) A written warning may be issued to the students concerned and a copy of the same may be displayed on the Notice Board.
- (ii) The matter may be reported to the Parents/Guardians and they may be called, if necessary.
- (iii) A student may be fined. The fine imposed shall have to be deposited with the Treasurer, under intimation to the Principal/Director/Chairman/ Secretary Discipline Committee/Council as the case may be.
- (iv) A student may be turned out of the class by the teacher concerned and be not permitted to attend the same course up to three periods at one time under intimation to the Principal/Chairman/Director.
- (v) A student may be placed on probation for a fixed period not exceeding 3 months. If during the period of probation, he fails to improve his conduct, he may be rusticated or expelled.

13. Training, Research And Analytical Facilities

The Institute has developed number of training, research and analytical facilities pertaining to fuel characterization, coal beneficiation, fuel conversion and hi-tech analytical instruments. The list of available facilities is provided below.

Sr. No.	Equipment
1	Digital Bomb calorimeter
2	Particle Size Analyzer
3	Digital Density Meter
4	Fourier Transform InfraRed Spectrometer
5	Dual Beam 8 Cell Scanning Spectrophotometer
6	H ₂ S Analyzer
7	Total Organic Carbon Analyzer
8	Froth Flotation Cell
9	Ash Fusion Analyzer
10	BET Surface Area Analyzer
11	CHNSO Analyzer
12	CRI-CSR System (along with Jaw Crusher, Screen and Tumbler Machine)
13	Magnetic Separator
14	Solid-Gas Separation System
15	Double Roll Crusher
16	Biomass Crusher
17	Rod Mill
18	Ball Mill
19	Hammer Mill
20	Sieve Shaker
21	Deister Concentrating Table
22	Jig Washer
23	Hardgrove Grindability Index Machine
24	Disc Mill
25	Saw Grinder
26	Thin Section and Petrographic Polisher

27	Ashing Furnace
28	Tube Furnaces
29	Minimum Free Space Oven
30	Muffle Furnaces
31	Flue Gas Analyzer
32	Thermogravimetric Analyzer
33	Gas Chromatograph
34	Automatic Abel Flash Point Analyzer
35	Automatic Cleveland Flash Point Analyser
36	Automatic Tag Flash Point Analyzer
37	Electric Tag Open Cup Flash Point Analyzer
38	Automatic PMCC Flash Point Analyser
39	Electric Abel Flash Point
40	Semiautomatic Cleveland Flash Point
41	Smoke Point Apparatus
42	Viscometer Bath
43	Viscometer Tube Cleaner and Dryer
44	Cloud and Pour Point Refrigerator
45	Dropping Point Apparatus
46	Semiautomatic Precision Penetrometer
47	Oxidation Stability Liquid Bath
48	Copper Corrosion Bath
49	Heated Centrifuge
50	Dew Point Apparatus
51	Flow Meter
52	Viscometer Tubes
53	Gasification Pilot Plant with Gas Cleaning System
54	Combustor Pilot Plant (along with Online Gas Analyzer)

The Institute is growing its facilities to train its students with state of the art, modern and advance training, and research facilities. These facilities will not only help in improving and understanding their theoretical and practical knowledge but also to carry out research activities, as well. Almost over **200** training, research and analytical

equipment will be added in addition to the above mentioned facilities over the next one and half year for the beneficiation of students.

14. Office of Research Innovation and Commercialization (ORIC)

In order to assist the University in promoting and enhancing research activities and helping them to commercialize and industrialize, Office of Research Innovation and Commercialization (ORIC) is working closely with the Ministry of Science and Technology (MoST), Islamabad. ORIC also helps to enhance research activities in Institutes / Colleges / Departments of the University and to protect intellectual property generated because of research activities.

The Institute has a focal person from the faculty members who in addition to his/her teaching responsibilities serves for effective communication, delivering and sharing of research ideas between ORIC and the Institute. For objectives of ORIC, visit the following website.

<https://www.hec.gov.pk/english/services/universities/ORICs/Pages/Objectives.aspx>

15. Institute-Industry Linkage/Collaboration

The Institute is currently providing following testing facilities to different industries in Pakistan, at the cheapest rates. So far more than 200 companies have benefitted from these testing facilities.

- Thermogravimetric analyzer
- Carbon Sulphur analyzer
- Elemental Analyzer
- Bomb Calorimeter (for measurement of heating value)
- Fourier Transform Infrared Spectroscopy

In addition to above testing facilities, the Institute provided testing facility to M/s Snowden (An Australian company hired by the Punjab Government) for the evaluation of Punjab coal reserves.

The Institute has also provided technical assistance in the feasibility studies to the Government of Punjab for the establishment of following power generation plants at National level.

- i. Punjab Power Development Company, Government of the Punjab, 660x2 MW Coal Based Power Plant at Qadar Abad - Sahiwal District, Punjab.
- ii. M/s Electro Power Generation Pvt. Ltd. 50 MW Coal Based Power Plant at Kalar Kahar, Distt. Chakwal.
- iii. M/s Saba Power Generation Company Pvt. Ltd. 50 MW Coal Based Power Plant at Kattha Sugral, Distt. Khushab.

- iv. M/s Noble Power Generation Company Pvt. Ltd. 50 MW Coal Based Power Plant at Mauza Dharabi, Tehsil Tala Gang, Distt. Chakwal.
- v. M/s Malakwal Power Pvt. Ltd. 50 MW Coal Based Power Plant at Varena Distt. Mandi Bahuddin.
- vi. Punjab Power Development Company, Government of the Punjab, 110 MW Coal Based Power Plant near Industrial Estates, Sundar, Lahore.
- vii. Punjab Power Development Company, Government of the Punjab, 110 MW Coal Based Power Plant near M-3 Industrial City, Faisalabad.
- viii. 2 x 660 MW Coal Based Power Plant at Rahim Yar Khan by Nishat group and Shanghai Electric Company, China
- ix. 2 x 660 MW Coal Fired Power Project at Balloki, Kasur by M/s. China Gezhouba Group Co., Ltd.
- x. Punjab Power Development Company Limited, Government of the Punjab, 150 MW Coal Based Power Plant at Sialkot
- xi. Punjab Power Development Company Limited, Government of the Punjab, 150 MW Coal Based Power Plant at Faisalabad
- xii. Punjab Power Development Company Limited, Government of the Punjab, 150 MW Coal Based Power Plant at Multan
- xiii. Punjab Power Development Company Limited, Government of the Punjab, 150 MW Coal Based Power Plant at Lahore
- xiv. 30MW Waste to Energy Power Plant at Lakhodair Site Lahore undertaken by Lahore Waste Management Company (LWMC)

The Institute is also providing consultancy services to the private enterprises for the following purposes:

- Gasification
- Coal cleaning/Coal fired electricity generation/Domestic utilization of coal
- Substitution of furnace oil/natural gas by coal in the industrial sector
- Transfer of technology from the developed/developing countries to Pakistan
- Spread of knowledge, experience and skill to the public within the country by integrating results on indigenous energy sources

NOTE
(Applicable to the schedule of all programs)

- ☞ The candidate is required to see the lists of Selectees and schedule of payment of dues on the Notice Board of the Institute or on the University website. He/She will not be provided/sent the above-mentioned information by the Institute through any other means.
- ☞ Once the candidate has been offered his/her higher option later he/she cannot be considered for his/her lower option irrespective of seats available in disciplines therein. In other words, there shall be no reverse processing for the generation of sequential merit lists.
- ☞ If a candidate, once selected for any option in the selectees' list, does not deposit his/her admission dues, shall lose / forfeit his/ her right to be considered for the high option(s) of disciplines given by him / her in his / her application form.

Disclaimer

The prospectus is informational and should not be taken as binding on the Institute. Each aspect of the educational setup, ranging from the admission procedure to the examination regulations or discipline, requires continual review by the competent authorities. The Institute, therefore, reserves the right to change/amend any rule/s and regulations applicable to students whenever it is deemed appropriate or necessary.

FACULTY OF ELECTRICAL, ENERGY &
ENVIRONMENTAL ENGINEERING
UNIVERSITY OF THE PUNJAB, LAHORE

OFF: +92 42 9923 2050, 9923 3109 FAX: +92 42 9923 3109



<http://ieee.pu.edu.pk/>