Prospectus
2020

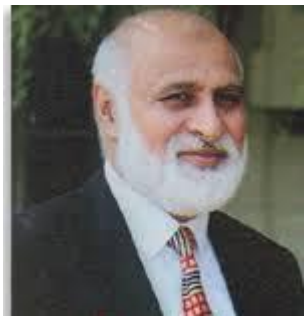


B.Sc. Engineering Courses
Self Supporting Program


بسم الله الرحمن الرحيم

CONTENTS

Message from Worthy Vice-Chancellor



The University of the Punjab is the leading University of Pakistan. It has maintained its excellence in education, training and research in various fields of arts, social sciences, engineering and technology.

The University aims at high standards of quality education compatible with national needs and comparable to international universities of high repute abroad. It has always attracted talented students coming from all walks of life and regions within its territorial limits and all provinces of Pakistan under exchange program.

The University recognizes an integrated and inter-disciplinary approach to coordinate and cooperative teaching among the various disciplines belonging to different faculties of constituent parts of the University under one umbrella. The Faculty of Engineering & Technology is one of the most developed faculties of the University. It has developed since 1917 with a long history of dedicated and devoted teachers and researchers in various fields of Engineering & Technology. The alumni of this Institution are serving at higher professional positions in industrial/research organizations and universities at home and abroad.

The faculty comprises of Institute of Chemical Engineering & Technology, College of Engineering & Emerging Technologies, Institute of Quality and Technology Management, Centre for Coal Technology 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. Niaz Ahmad Akhtar (S.I.)

VICE CHANCELLOR

1. FACULTY OF ENGINEERING & TECHNOLOGY

1.1 Brief History

1917 : A two-year course, leading to B.Sc. Degree in Technical Chemistry was started by Punjab University at Forman Christian College Lahore.

1925 : A two-year course was replaced by a three years course leading to B.Sc. (Hons) Degree followed by a one year M.Sc. (Hons.) course in Technical Chemistry.

1939 : University of the Punjab merged the B.Sc. (Hons) course of Chemistry and Technical Chemistry by modifying the syllabi in such a manner that the B.Sc. (Hons) in Chemistry included the necessary course requirements for admission to M.Sc. (Hons) in Technical Chemistry.

1941 : The department temporarily shifted at the Punjab College of Engineering and Technology, Mughalpura as an independent department of Chemical Technology.

1946 : The department was shifted to Punjab University, Old Campus.

1948 : The department was raised to the status of the Institute of Chemical Technology.

1950 : A four-year Course in Chemical Technology was started.

1957 : The improvement in syllabi and course of reading was carried out and this resulted, ultimately, in the Institution of parallel course leading to B.Sc. (Hons.) Tech degree in Chemical Engineering.

1966 : Chemical Technology was accorded recognition as a professional subject by the University.

1970 : The following professional degree courses were launched.

1. B.Sc. (Engg.) Chemical Engineering
2. B.Sc. (Engg.) Metallurgy and Materials Science
3. M.Sc. (Engg.) Chemical Engineering
4. M.Sc. (Engg.) Metallurgy and Materials Science

1982 : The Faculty of Engineering and Technology was established at the University of the Punjab with the purpose of expanding its educational/training programs in the allied disciplines to meet the demands of newly emerging technologies in the country.

2002 : Institute of Quality & Technology Management was established under the Faculty of Engineering & Technology.

2002 : Centre for Coal Technology was established under the Faculty of Engineering & Technology.

2005 : College of Engineering & Emerging Technology was established under the Faculty of Engineering & Technology.

2010 : Department of Textile Engineering & Technology was established under the Faculty of Engineering & Technology.

2010 : Department of Polymer Engineering & Technology was established under the Faculty of Engineering & Technology.

1.2 B.Sc. (Engg.) Courses offered under the Faculty

At the **Institute of Chemical Engineering & Technology**

1. B.Sc. (Engg.) Chemical Engineering
2. B.Sc. (Engg.) Chemical Engineering with specialization in Petroleum & Gas Technology

At the **Institute of Energy and Environmental Engineering**

1. B.Sc. (Engg.) Energy Engineering

At the **College of Engineering & Emerging Technologies**

1. B.Sc. (Engg.) Metallurgy & Materials Engineering

Our B.Sc. (Engg.) programmes are set on the Outcome Based Education (OBE) system as per Pakistan Engineering Council guidelines.

1.2.1 Washington Accord and Outcome Based Education (OBE) system:

Pakistan Engineering Council (PEC) signed Washington Accord in 2017 which is an international agreement between bodies that are responsible for accrediting the Engineering Degree Programmes in their respective signatory countries. It is a globally recognized standard of engineering education and accreditation system. It grants equivalence of degrees at an international level which aims to benefit engineers with mobility across borders. All engineering disciplines have implemented Outcome Based Education System as per requirements of Washington Accord. This opens gates for our graduates to be of the same value as in the developed countries. Under OBE system the students get opportunity to go through a world class learning experience focused on 12 engineering attributes which transforms a student into a professionally trained human resource with ethical values.

1.2.2 Vision of University of the Punjab

“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.”

1.2.3 Mission of the University

“Our mission is to provide a holistic education as such an approach has a twofold 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.”

1.3 INSTITUTE OF CHEMICAL ENGINEERING & TECHNOLOGY

Today practically almost all the chemical and process industry in the country is being manned by the graduates of the institute of chemical engineering and technology. The alumni of the Institute have contributed significantly to the industrial growth and economic development of the country by helping in the design, construction, commissioning, operation and management of many important chemical plants, petroleum refineries and a number of allied industrial units. They are holding highly responsible positions in Pakistan Council of Scientific and Industrial Research, Pakistan Atomic Energy Commission, Chemical and Process Industries both in the private and public sector, Defense Organizations, Universities and Government Departments etc. The Institute has the unique honor that 19 of its alumni have been decorated with National Awards by the Government of Pakistan, which is the highest number from any single institution in the country.

The Institute has state of the art laboratories including unit operation, computer simulation and post graduate research labs. Institute offers Ph.D. programs in addition to B.Sc. & M.Sc. in Chemical Engineering.

The Institute is looking forward to launch new state-of-the-art engineering disciplines according to the market needs.

Prof. Dr. Abdullah Khan Durrani

DIRECTOR

1.3.1. FACULTY

Professors

1. Dr. Niaz Ahmad Akhtar[1] (Sitara – e – Imtiaz)
(Chemical Engineering & Fuel Combustion & Energy)
B.Sc. (Engg.) Chemical Engineering,
Ph.D. (University of Leeds, UK), P.E.

2. Dr. Abdullah Khan Durrani (Director)
B.Sc. (Engg.) Chemical Engineering
Ph.D. (University of the Punjab, Pak), P.E.

3. Dr. Mahmood Saleem
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (Graz University of Technology, Austria), P.E.

4. Dr. Rafi Ullah Khan
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering,
M.Sc. Computer Science,
Ph.D. (University of Karlsruhe, Germany), P.E.

5. Dr. Syed Nadir Hussain
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (University of Manchester, UK), P.E.

6. Dr. Muhammad Rashid Usman
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (University of Manchester, UK), P.E.

7. Dr. Hafiz Muhammad Anwaar Asghar
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg) Chemical Engineering
Ph.D. (University of Manchester, UK), P.E.

[1] Vice Chancellor, University of the Punjab

8. Dr. Amir Shafeeq

B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
M.B.A. (Marketing),
Ph.D. (Universiti Teknologi PETRONAS, Malaysia), P.E

9. Dr. Majid Majeed Akbar

B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (Universiti Teknologi PETRONAS, Malaysia), P.E.

Associate Professors

1. Dr. Ayyaz Muhammad

B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (Universiti Teknologi PETRONAS, Malaysia), P.E.

2. Dr. Javeed Ashraf Awan

B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering,
Ph.D. (Ecole Nationale Superieur Des Mines De Paris, France)
Post-doc (Technical University of Denmark, Denmark)

3. Dr. Waheed Afzal

B.Sc.(Engg.) Chemical Engineering
MS Total Quality Management
Ph.D. (MINES ParisTech, France and DTU Denmark)
Post-doc (University of California, USA)

4. Dr. Khurram Shahzad

B.Sc.(Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (University of the Punjab, Pak), P.E.
Post-doc (University of Montreal, Canada)

5. Dr. Javaid Akhtar (On Leave)

B.Sc.(Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering, (KAIST, South Korea)
Ph.D. (Universiti Teknologi Malaysia, Malaysia), P.E.

6. Dr. Syed Sheraz Dawood
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering,
Ph.D. (University of Leeds, UK), P.E.

7. Dr. Rabya Aslam
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (University of Erlangen-Nuremberg, Germany)

Assistant Professors

1. Dr. Toor-e-Aiman Rizvi
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (University of Leeds, UK), P.E.

2. Dr. Asim Hassan Rizvi
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (University of the Punjab, Pak), P.E.

3. Dr. Sofia Ch.
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering, P.E.
Ph.D. (Monash University, Australia)

4. Mr. Mudassar Azam (On Leave)
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering, P.E.

5. Dr. Bilal Haider
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering, P.E.
M.S. Total Quality Management
Ph.D. (University of Erlangen-Nuremberg, Germany)

6. Dr. Saadia Mumtaz
B.S., Mathematics
M.Phil., Mathematics
Ph.D. Applied Mathematics, (University of the Punjab, Pak)

7. Dr. Mujtaba Ikram

BS (Hons.), Computational Physics
M.S. Materials and Surface Engineering
Ph.D. Material Physics and Chemistry, (University of Science and Technology of China, China)

8. Dr. Muhammad Usman Rashid

B.Sc.(Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering,
Ph.D. (Universiti Teknologi Malaysia, Malaysia)

Lecturers

1. Engr. Sana Ullah (On Study Leave)
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering, P.E.

2. Dr. Syed Zohaib Javaid Zaidi
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Management (UET)
Ph.D. (University of Southampton, UK), P.E.

3. Engr. Ali Nadeem
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering (PU)

Lab Engineers

1. Engr. Abid Mehmood
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering.

2. Engr. Nazish Aslam
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering

3. Engr. Syeda Youmneh Batool
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering

Visiting Faculty

1. **Prof. Dr. Muhammad Arif Butt**
   Professor of Emeritus, Ex-Dean & Director, Institute of Chemical Engineering & Technology, University of the Punjab, Lahore

2. **Prof. Dr. Zafar Rashid**
   Ph.D, Chemical Engineering

3. **Dr. Aneela Sabir**
   Ph.D, Chemical Engineering, PU

4. **Miss Saba Zia**
   M.Phil. Polymer Technology

5. **Dr. Muhammad Shafiq**
   Ph.D, Chemical Engineering, PU

6. **Dr. Farooq Abdullah**
   Ph.D, Pakistan Studies, University of the Punjab, Lahore.

7. **Miss Aysha Khalid**
   M.Phil., English, University of the Punjab, Lahore.

8. **Eng. Uzair Ahmed**
   M.Sc., Electrical Engineering, LUMS Lahore.

9. **Syed Ali Raza**
   M.A., Pakistan Studies, University of the Punjab, Lahore.

1.3.2. Academic Programs at the Institute of Chemical Engineerıng & Technology

	Degree	Duration
1.	B.Sc. (Engg.) Chemical Engineering	4 yrs.
2.	B.Sc. (Engg.) Chemical Engineering with specialization in Petroleum and Gas Technology	4 yrs.
3.	M.Sc. (Engg.) Chemical Engineering	2 yrs.
4.	Ph.D. (Engg.) Chemical Engineering	3 yrs.

1.3.3 Vision of the Institute

To be a world class engineering institute recognized for excellence in education, innovation and entrepreneurship leading to socio-economic development of society.

1.3.4 Mission of the Institute

The Institute of Chemical Engineering and Technology strives to:

- Provide a high-quality learning experience to produce Chemical Engineers to meet the human resource needs of the country.
- Provide technical skills in design, synthesis, optimization and operations that will equip graduates in assuming leadership positions in education, research and services.

1.3.5 Program Educational Objectives (PEOs)

The graduates from the Institute are expected to meet the following program educational objectives through our educational structure:

PEO1: Apply knowledge and skills to work effectively as productive Chemical Engineers and entrepreneurs (individually as well as a team member) in chemical process industries, academic and research organizations, chemical marketing and sales companies, and government departments.

PEO2: Constantly advance knowledge through professional training, research and lifelong learning.

PEO3: Work professionally and communicate effectively in order to devise technically sound and optimal solutions to engineering problems while observing ethical practices.

1.4 INSTITUTE OF ENERGY AND ENVIRONMENTAL ENGINEERING

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 East 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. Mahmood Saleem
DIRECTOR

1.4.1 FACULTY

Professors

1. Dr. Mahmood Saleem (Director)
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering,
Ph.D. (Graz University of Technology, Graz, Austria), P.E.

2. Dr. Shahid Munir (On leave)
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering, MBA
Ph.D. (University of Leeds, UK), P.E.

3. Dr. Hamed Sattar
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 (Wyoming, USA)

2. Dr. Hassan Zeb
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (Sungkyunkwan University, South Korea), P.E.

3. Dr. Sarfraz Akram
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering, MBA
Ph.D. (University of the Punjab, Lahore), P.E.

4. Dr. Muhammad Zafar
B.Sc. (Engg.) Chemical Engineering
M.Sc. (Engg.) Chemical Engineering
Ph.D. (Chonnam National University, South Korea), P.E.

Lecturers

1. Engr. Iqra Aziz
B.Sc. (Engg.) Chemical Engineering,
M.Phil. Coal Technology, P.E.

2. Engr. Abuzar Ahsan
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering, P.E.

IPFP-Fellows

1. Dr. Zaeem Bin Babar
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering,
Ph.D. (Kyungpook National University, South Korea), P.E.

2. Dr. Hafiz Abdul Manan
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering,
Ph.D. (University Technology Petronas, Malaysia),
Post Doc (University Technology Petronas, Malaysia), P.E.

Lab Engineers

1. Engr. Muhammad Saif Ullah
B.Sc. (Engg.) Electrical Engineering,
M.Sc. (Engg.) Energy & Environmental Engineering, P.E.

2. Engr. Yumna Batool
B.Sc. (Engg.) Chemical Engineering,
M.Sc. (Engg.) Chemical Engineering, P.E.

Visiting Faculty

1. Prof. Dr. Shafqat Nawaz

B.Sc. (Chemical Engineering) PU
M.Sc. (Chemical Engineering) PU
Ph.D. (Fuel Engineering) Leeds, UK

2. Dr. Naseeruddin Sheikh

Former Member Technology, PCSIR Former Member Board of Directors & Chairman Technical Committee on Saindak Copper-Gold Project.
B.Sc. Hons., M.Sc. (Chem.)PU
Ph.D. (Mineral Process Engg.) UBC Canada

3. Dr. Khurram Shahzad

B.Sc. (Chemical Engineering) PU
M.Sc. (Chemical Engineering) UET
Ph.D. (University of the Punjab, Pak), P.E.
Post-doc (University of Montreal, Canada)

4. Miss Sumaira Kanwal

B.Sc. PU, M.Sc. (Coal Technology) PU
M.Phil. (Environmental Science) PU

5. Engr. Majid Ali Baig

B.Sc. (Engg.) Electrical Engineering
M.Sc. (Electric Power and Energy Engineering)

6. Engr. Kashif Habib

B.Sc. (Engg.) Electrical Engineering
M.Sc. (Electrical Engineering) 2014

7. Engr. Sohail Moghal

Master of Business Administration, LUMS, Pakistan

8. Dr. Muhammad Ali

Ph.D. (National College of Business Administration & Economics (Lahore, Pakistan) / University of British Columbia (Canada) 2017

9. Dr. Ayyaz Muhammad

B.Sc. (Chemical Engineering) PU
Ph.D (Universiti Teknologi Petronas, Malaysia) 2009

1.4.2. Academic Programs at the Institute of Energy and Environmental Engineering

Sr. No.	Degree Program	Duration
1	B.Sc. (Engg.) Energy Engineering (Regular and Self-Supporting)	4 yrs.
2	M.Sc. Coal Technology (Regular)	2 yrs.
3	M.Phil. Coal Technology (Self-Supporting/Evening)	2 yrs.
4	M.Sc. (Engg.) Energy & Environmental Engineering (Self-Supporting/Evening)	2 yrs.
5	Ph.D. (Engg.) Energy Engineering (Regular)*	3 yrs.

**** The Ph.D. program will be offered after issuance of NOC from Higher Education Commission of Pakistan.***

1.4.3 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 society.

1.4.4 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.

1.4.5 Program Educational Objectives (PEOs) of B.Sc. (Engg.) Energy Engineering

The graduates from the Institute are expected to meet the following program educational objectives through our educational structure:

PEO-01: Apply engineering knowledge to identify and address the technical and societal problems

PEO-02: Enhance students' intellectual and analytical abilities in taking initiative and/or developing innovative ideas for technological and professional growth in the field of energy engineering

PLO-03: Work effectively as a team member or lead multidisciplinary teams while determining / demonstrating the interpersonal and management skills and ethical responsibilities.

1.5 COLLEGE OF ENGINEERING AND EMERGING TECHNOLOGIES

The College of Engineering and Emerging Technologies (CEET) has been established in 2005 under the Faculty of Engineering and Technology. CEET is comprised of Department of Metallurgy & Materials Engineering and Department of Electrical Engineering. The vision of CEET is to provide the highest quality engineering and technology education to its students in order to prepare them for engineering and technology industry. The College is committed to assist the industry in fulfilling it countrywide mission in technology and economic development by providing applied research, training and consulting services to businesses and industries. Basic mission of the College is to educate and provide student abilities required to apply engineering principles to solve many varied technical problems of industry.

1.5.1 DEPARTMENT OF METALLURGY & MATERIALS ENGINEERING

The B.Sc. (Engg.) Metallurgy & Materials program aims to produce engineers who can contribute effectively in the operation and development of Metallurgical and Materials' industry of the country. The curriculum for B.Sc. (Engg.) degree aims to inculcate scientific knowledge and technical skills in the graduates so that they can effectively work in industry and research and development organizations. This course will prepare students through teaching various courses, laboratory training and research activities so that they can be able to understand, develop and manufacture wide range of materials including metals, alloys, composites, ceramics, polymers and other advanced materials for the next generation of products to design complex engineering systems. The Department of Metallurgy & Materials Engineering has developed a curriculum and state of art laboratories under the supervision of highly qualified and experienced faculty members which are one of the best in the country.

Metallurgy and Materials Engineering is a challenging field for the intelligent, hard working and devoted students who have ambition to study advanced materials for the ever expanding industrial economy and modernization.

In 2019, the Department of Metallurgy and Materials Engineering implemented Out Come Based Education System according to requirement of Pakistan Engineering Council. This system has uplifted our engineering education standards and made it equivalent to international standards. The OBE-based engineering degree will enable our graduates to get jobs anywhere in the world without acquiring additional qualifications. Under OBE-system students get opportunity to have a world class learning experience focused on 12 engineering attributes which transforms a student into a professionally trained human resource and useful citizen of the society.

I hope that the scope of B.Sc. (Engg.) degree in Metallurgy & Materials Engineering would increase in Pakistan and more and more employment opportunities would be available in universities, research organizations and industry. We welcome talented students to join this course to shoulder the responsibility as materials engineers in building our nation and assisting all other engineering disciplines as needed by the society and industry. We also offer M.Sc. Engineering leading to Ph.D degree to talented students of B.Sc. (Engg.) Metallurgy and Materials Engineering.

Prof. Dr. Abdus Salam

CHAIRMAN

1.5.1.1 FACULTY

(a) Department of Metallurgy & Materials Engineering

Professors

1. **Dr. Abdus Salam (**Chairman)
   B.Sc. (Engg.) Metallurgy & Material Science (PU),
   Ph.D. (Leeds, UK) P.E.

2. **Dr. Mohsin Ali Raza**
   B.Sc. (Engg.) Metallurgy & Materials Science, (PU)
   M.Sc. (Engg.) Materials Science with specialization in Nanomaterials and Nanotechnology, (KTH, Sweden), P.E.
   Ph.D. (University of Leeds, UK)

Associate Professor

1. **Dr. Asma Salman**
   B.Sc. (Engg.) Metallurgy & Materials Science, (PU)
   M.Sc. (Engg.) Metallurgy & Materials Engineering, (PU) P.E.
   MCS. (PU)
   Ph.D. (New Zealand)

Assistant Professors

1. **Mr. Aamir Nadeem Malik**
   B.Sc. (Engg.) Metallurgy & Materials Science, (PU), P.E.
   M.Sc. (Engg.) Metallurgy & Materials Science, (PU)

2. **Dr. Muhammad Kamran**
   B.Sc. (Engg.) Metallurgy & Materials Science (PU)
   M.Sc. (Engg.) Metallurgical Engineering, (NED), P.E.
   Ph.D. (University of Leoban, Austria)

3. **Dr. Aqil Inam**
   B.Sc. (Engg.) Metallurgical Engineering and Materials Science,
   M.Sc. (Engg.) Metallurgy & Materials Science, (PU), P.E.
   Ph.D (University of Leeds, UK)

4. **Dr. Tahir Ahmad**
   B.Sc. (Engg.) Metallurgy & Materials Science, (PU),
   M.Sc. (Engg.) Metallurgy & Materials Science, (PU), P.E.
   Ph.D (University Teknologi PETRONAS, Malaysia)

5. Dr. Muhammad Umar Manzoor
B.Sc. (Engg.) Metallurgy & Materials Science, (PU)
M.Sc. (Engg.) Metallurgical and Materials Engineering, (UET), PE
Ph.D (University of Ulster, UK)

6. Dr. Muhammad Atif Makhdoom
B.Sc. (Engg.) Metallurgical and Materials Engineering,(UET)
M.Sc. (Engg.) Metallurgical and Materials Engineering, ,(UET) P.E
Ph.D (University of Erlangen-Nuremberg, Germany)

7. Mr. Nouman Alam Siddique
B.Sc. (Engg.) Metallurgical and Materials Engineering,(PU)
M.Sc. (Engg.) Metallurgical and Materials Engineering, ,(UET) P.E

Lecturers

1. Mr. Faraz Hussain
B.Sc. (Engg.) Metallurgy & Materials Science, (PU)
M.Sc. (Engg.) Metallurgical and Materials Engineering, (UET), RE

2. Mr. Fahad Riaz
B.Sc. (Engg.) Metallurgy & Materials Science, (PU)
M.Sc. (Engg.) Metallurgy & Materials Science, (PU), RE

3. Ms. Sehrish Mukhtar
B.Sc. (Engg.) Metallurgy & Materials Science, (PU)
M.Sc. (Engg.) Metallurgy & Materials Science, (PU), RE

4. Mr. Muhammad Ishtiaq
B.Sc. (Engg.) Metallurgy & Materials Science, (PU)
M.Sc. (Engg.) Metallurgy & Materials Engineering, (UET), PE

5. Mr. Ameeq Farooq
B.Sc. (Engg.) Metallurgy & Materials Engineering, (PU)
M.Sc. (Engg.) Metallurgy & Materials Engineering, (PU), RE

6. Mr. Muhammad Haseeb Hassan
B.Sc. (Engg.) Metallurgy & Materials Engineering, (PU)
M.Sc. Health, Safety & Environment, (Germany), RE

7. Mr. Muhammad Saqib Qayyum
B.Sc. (Engg.) Metallurgy & Materials Engineering, (PU)
M.Sc. (Engg.) Metallurgy & Materials Engineering, (PU), RE
(On study leave abroad)

Visiting Faculty

1. **Dr. Afsheen Masood Malik**
   Institute of Applied Psychology, University of the Punjab, Lahore

2. **Ms. Saniya Ali**
   C/o College of Engineering & Emerging Technologies, University of the Punjab, Lahore.

3. **Mrs. Bushra Siddiqui**
   C/o College of Engineering & Emerging Technologies, University of the Punjab, Lahore.

4. **Mr. Hasnat Mahboob Bhatti**
   C/o College of Engineering & Emerging Technologies, University of the Punjab, Lahore.

5. **Ms. Saba Zia**
   C/o College of Engineering & Emerging Technologies, University of the Punjab, Lahore.

1.5.3. Courses offered at College of Engineering & Emerging Technologies

1.5.3.1 Academic Programs at the Department of Metallurgy & Materials Engineering

	Degree	Duration
1.	B.Sc. (Engg) Metallurgy & Materials Engineering	4 years
2.	M.Sc. (Engg) Metallurgy & Materials Engineering	2 years
3.	Ph.D. (Engg) Metallurgical Engineering	4 years
4.	Post-Graduate Diploma in Foundry Technology	1 year
5.	Post-Graduate Diploma in Corrosion Technology	1 year
6.	Short Courses	--

2. ADMISSION RULES

ELIGIBILITY

2.1 (a) General

- An applicant must have appeared in the combined Entry Test conducted by the University of Engineering & Technology for the Academic Session 2020-2021. (The test is mandatory for admission on open academic merit and carry 30% weightage for determining merit.)
- An applicant must be domiciled in Punjab.
- An applicant must have passed his F.Sc./DAE Examination or equivalent examination in 2018, 2019 or Spring Examination 2020. The candidates placed in compartment in respective examination are not eligible.
- An applicant for admission to the B.Sc. (Engg.) First Semester on F.Sc./DAE basis or equivalent examination must not be above Twenty Four (24) years of age as on 05 October, 2020.

The merit of all such applicants, awaiting for their Intermediate Part-II or equivalent complete result, will be made by incorporating the marks of Intermediate Part-I or equivalent in basic merit criteria.

2.1 (b) For Admission on F.Sc. Basis:

In addition to fulfilling the general eligibility conditions as given in 2.1(a), an applicant seeking admission to B.Sc. (Engg.) must have passed the F.Sc. (Pre-Engineering) Examination from any recognized Board of Intermediate & Secondary Education of Pakistan or any other examination considered equivalent thereto by the Punjab University. The candidate with A-level qualification must submit O-level and A-level equivalence certificates from the Inter Board Committee of Chairmen (IBCC), Islamabad.

An applicant must have obtained at least 60% marks (excluding Hafiz-e-Quran) either in Intermediate Examination or on the basis of Aggregated Marks Percentage calculated as given below :

$\mathbf{A} = \left[\frac{(Marks\ Obtained\ in\ F.Sc.\ or\ equivalent\ examination) + (Hafiz\text{-}e\text{-}Quran)^{*}}{1100} \right] \times 70$	
$\mathbf{T} = \left[\frac{\text{Marks Obtained in Entry Test}}{400} \right] \times 30$	**Aggregated Marks Percentage = A + T**

* 20 marks for Hafiz-e-Quran, if applicable, will be added as shown above.

For the 2020-21 Admissions regarding merit determining position, Aggregated Marks Percentage for the all the candidates (2018, 2019 and 2020) will be calculated as given below :

$\mathbf{A} = \left[\frac{(\text{Marks Obtained in F.Sc. Part I}) + (\text{Hafiz - e - Quran})^{*}}{520} \right] \times 70$	
$\mathbf{T} = \left[\frac{\text{Marks Obtained in Entry Test}}{400} \right] \times 30$	**Aggregated Marks Percentage = A + T**

* 20 / (1100/520) marks for Hafiz-e-Quran, if applicable, will be added as shown above.

For Admission on O/A level Basis:

Aggregated Marks Percentage for the all such candidates (2018, 2019 and 2020) will be calculated on basis of O level result as given below :

$\mathbf{A} = \left[\frac{(\text{Equivalance Marks Obtained in O Level}) + (\text{Hafiz - e - Quran})^{*}}{1100} \right] \times 70$	
$\mathbf{T} = \left[\frac{\text{Marks Obtained in Entry Test}}{400} \right] \times 30$	**Aggregated Marks Percentage = A + T**

* 20 marks for Hafiz-e-Quran, if applicable, will be added as shown above.

2.1. (c) For Admission on Diploma Basis:

In addition to fulfilling the general eligibility conditions as given in 2.1(a), an applicant must have passed the Diploma of Associate Engineer Examination from the Board of Technical Education of Pakistan in the following relevant discipline:

- An applicant seeking admission to B.Sc. (Engg.) Chemical Engineering must hold Diploma of Associate Engineer in Chemical Technology/Chemical Processing Technology/Chemical Technology with specialization in Sugar.
- An applicant seeking admission to B.Sc. (Engg.) Chemical Engineering with specialization in Petroleum & Gas Technology must hold Diploma of Associate Engineer in Petroleum Technology/Petrochemical.
- An applicant seeking admission to B.Sc. (Engg.) Metallurgy & Materials Engineering must hold Diploma of Associate Engineer in Metallurgy & Welding/ Foundry and Pattern Making.
- An applicant seeking admission to B.Sc. (Engg.) Electrical Engineering must hold Diploma of Associate Engineer in Electrical Technology/Electronics.

An applicant must have obtained at least 60% marks (excluding Hafiz-e-Quran) either in Diploma of Associate Engineer Examination or on the basis of Aggregated Marks Percentage calculated as given below:

$\mathbf{A} = \left[\frac{(\text{Marks Obtained in DAE})^{**} + (\text{Hafiz - e - Quran})^{*}}{3200} \right] \times 70$	
$\mathbf{T} = \left[\frac{\text{Marks Obtained in Entry Test}}{400} \right] \times 30$	**Aggregated Marks Percentage = A + T**

* 20 marks for Hafiz-e-Quran, if applicable, will be added as shown above.

** Marks obtained in DAE examination out of total marks other than 3200 will be converted on the basis of 3200 for calculating 'A'.

For the 2020-21 Admissions regarding merit determining position, Aggregated Marks Percentage for the all the candidates (2018, 2019 and 2020) of Diploma of Associate Engineer will be calculated as given below :

$\mathbf{A} = \left[\frac{(\text{Marks Obtained in DAE (1st and 2nd year)})^{**} + (\text{Hafiz - e - Quran})^{*}}{2250} \right] \times 70$	
$\mathbf{T} = \left[\frac{\text{Marks Obtained in Entry Test}}{400} \right] \times 30$	**Aggregated Marks Percentage = A + T**

* 20/ (3200/2250) marks for Hafiz-e-Quran, if applicable, will be added as shown above.

** Marks obtained in DAE examination out of total marks other than 3200 will be converted on the basis of 3200 for calculating 'A'.

Note: If two or more candidates have equal aggregated marks percentage (up to three points of decimal), then their merit will be determined on the basis of the marks obtained in the one step lower examination Passed, and then on the basis of ages with percentage given to the elder candidate.

2.1.1. Procedure for Application

Application filled and generated online must be accompanied by the following:

1. Photocopies of the following documents :
   - (i) Matriculation certificate
   - (ii) F.Sc./Diploma or equivalent certificate (as the case may be)
   - (iii) Photocopy of the result of Pre-Admission Combined Entry Test conducted by UET, Lahore for the current session.
   - (iv) Character certificate
   - (v) Domicile certificate
   - (vi) Hafiz-e-Quran certificate (if any): The candidate should produce a certificate from a well established Institution to the effect that he/she is a Hafiz-e-Quran. Moreover, the Faculty shall interview the candidate and make sure that he/she had learnt the Holy Quran by heart and can recite it from whatever portion he/she is required to recite.
   - (vii) Migration certificate (in case the applicant has passed F.Sc./Diploma examination from a Board/University other than Board of Intermediate and Secondary Education, Lahore; Punjab University and Punjab Board of Technical Education, Lahore).
   - (viii) Medical fitness certificate (on prescribed form) from registered Medical Practitioner to be submitted at the time of admission.
2. One 1.5" x 1.5" size latest photograph (to be affixed on the form).

Application incomplete/not submitted within due time in the said office of the Faculty will not be entertained. General waiting list along with list of the selected candidates for each course will be displayed on the university website only.

NOTE :

(i) 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.

(ii) 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.

The original documents of the candidates being admitted shall be retained by the Institute/Department until such time as deemed necessary. The candidate selected on open academic merit, shall then be depositing the dues in the Habib Bank Ltd., (New Campus Branch), Punjab University, Quaid-e-Azam Campus, Lahore by the closing hour of the bank till the due date mentioned in the admission schedule; failing which the seat will stand vacated automatically and shall be filled on academic merit from amongst the candidates placed on waiting list.

The admission of the candidate shall be cancelled at any stage in case he/she 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.

3. Collect the Registration Card/slip from the office of the Institute of Chemical Engineering & Technology the same day after submitting the receipt of the Bank in original along with its two photocopies in order to regularize the provisional admission, failing which the admission of the candidates shall be cancelled.

2.1.2. Allocation of Seats for admission to the B.Sc. (Engg.) First Semester on Self Supporting

Self-Supporting Program (Section B)

Name of the Course	F.Sc. Basis	Relevant Diploma Basis	Total
B.Sc. (Engg.) Chemical Engineering	40	0	40
B.Sc. (Engg.) Chemical Engineering with specialization in Petroleum & Gas Technology	10	0	10
B.Sc. (Engg.) Metallurgy & Materials Engineering	49	1*	50
B.Sc. (Engg.) Energy Engineering	40	-	40

* Qualification requirement : DAE in Metallurgy & Welding/Foundry and Pattern Making

3. Fee Structure

B.Sc. (Engg.) Courses (Self-Supporting Program: Section B) (2019-2020)

Sr. No.	Particulars of Receipt/Head of Accounts	Semester							
		I	II	III	IV	V	VI	VII	VIII
1	Tuition Fee	39700	39700	39700	39700	39700	39700	39700	39700
2	Admission Fee	300	300	300	300	300	300	300	300
3	Library Service	400	400	400	400	400	400	400	400
4	Identity Card	--	--	--	--	--	--	--	--
5	Breakage Fee	500	500	500	500	500	500	500	500
6	Field Work/Studies Tour	1000	1000	1000	1000	1000	1000	1000	1000
7	Electricity Charges	910	910	910	910	910	910	910	910
8	P.U. Medical Fee	175	--	175	--	175	--	175	--
9	Bus Pass Charges	1990	1990	1990	1990	1990	1990	1990	1990
10	University Registration Fee*	3720	--	--	--	--	--	--	--
11	Examination Fee	9487	9487	9487	9487	9487	9487	9487	9487
12	Result Notification Fee	100	100	100	100	100	100	100	100
13	Mosque Fund	50	--	50	--	50	--	50	--
14	Students General Fund	--	--	--	--	--	--	--	--
15	Department Society Fee	--	--	--	--	--	--	--	--
16	P.U. Internet Facility	970	--	970	--	970	--	970	--
17	PUSTC/PUWSTC Fee	500	--	500	--	500	--	500	--
18	Sports Fund (PUTDSA)	200	--	200	--	200	--	200	--
19	Sports Development Fund	200	--	200	--	200	--	200	--
20	PU Development Fund	500	--	--	--	--	--	--	--
21	PU Library Security	2000	--	--	--	--	--	--	--
22	Department Development Fund	1500	1500	1500	1500	1500	1500	1500	1500
23	Student Welfare Fund	500	--	500	--	500	--	500	--
	Total	**64702**	**55887**	**58482**	**55887**	**58482**	**56262**	**58482**	**56262**

***Only for those candidates who are not already registered with University of the Punjab.

4. 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.

5. 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.

6. 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 class room 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.

PROGRAMME STRUCTURE

FOR

B.Sc. (Engg.) Chemical Engineering

(1) B.Sc. (Engg.) Chemical Engineering

(2) B.Sc. (Engg.) Chemical Engineering
with specialization in Petroleum & Gas Technology

1st Semester

Paper	Course Code	Course Title	Lecture Hours	Lab. Hours	Credit Hours
I	CHE 111	Chemical Process Industries -I	3	0	3
II	MTH 112	Engineering Mathematics-I	2	0	2
III	NEN 113	Functional English	2	0	2
IV	HUM 114	Islamic Studies/ethics*	2	0	2
V	PHY 115	Applied Physics	3	0	3
VI	CHEM 116	General Chemistry	3	0	3
VII	PHY 117	Applied Physics Lab	0	3	1
VIII	CHEM 118	Applied Chemistry Lab	0	3	1
IX	CHE119	Engineering Drawing	1	0	1
		Total	**16**	**6**	**18**

2nd Semester

Paper	Course Code	Course Title	Lecture Hours	Lab. Hours	Credit Hours
I	CHE 121	Chemical Process Industries-II	3	0	3
II	CHE 122	Chemical Engineering Principles-I	3	0	3
III	MTH 123	Engineering Mathematics-II	3	0	3
IV	ME 124	General Engineering	3	0	3
V	CHEM 125	Physical Chemistry	3	0	3
VI	CHEM 126	Physical Chemistry Lab	0	3	1
VII	CHEM 127	Chemical Process Industries Lab	0	3	1
VIII	CSC 128	Computer aided Engineering Drawing Lab	0	3	1
		Total	**15**	**9**	**18**

* Only for non-muslim students in place of Islamic Studies.

3rd Semester

Paper	Course Code	Course Title	Lecture Hours	Lab. Hours	Credit Hours
I	CHE 231	Chemical Engineering Principles-II	3	0	3
II	CHE 232	Heat Transfer	3	0	3
III	CHE 233	Fluid & Particle Mechanics-I	3	0	3
IV	HUM 234	Pakistan Studies	2	0	2
V	MTH 235	Engineering Mathematics-III	3	0	3
VI	CHE 236	Heat Transfer Lab	0	3	1
VII	CHE 237	Fluid & Particle Mechanics-I Lab	0	3	1
VIII	CSC 238	Computing & Computer Programming Lab.	0	3	1
		Total	**14**	**9**	**17**

4th Semester

Paper	Course Code	Course Title	Lecture Hours	Lab. Hours	Credit Hours
I	CHE 241	Particulate Technology	3	0	3
II	CHE 242	Chemical Engineering Thermodynamics-I	3	0	3
III	CHE 243	Unit Processes	2	0	2
IV	CHE 244	Fluid & Particle Mechanics-II	3	0	3
V	CHE 245	Computer Applications in Chemical Engineering	1	0	1
VI	CHE 246	Particulate Technology Lab	0	3	1
VII	CHE 247	Fluid & Particle Mechanics-II Lab	0	3	1
VIII	CHE 248	Computer Applications in Chemical Engineering Lab	0	3	1
		Total	**12**	**9**	**15**

5th Semester

Paper	Course Code		Course Title	Lecture Hours	Lab. Hours	Credit Hours
I	Elective –I	CHE 351A	Environmental Engineering	2	0	2
		CHE 351B	Natural Gas Engineering – I			
		CHE 351C	Nuclear Engineering			
II	CHE 352		Chemical Engineering Thermodynamics II	2	0	2
III	CHE 353		Mass Transfer	2	0	2
IV	CHE 354		Separation Processes-I	3	0	3
V	ME 355		Engineering Materials	2	0	2
VI	CHE 356		Chemical Reaction Engineering	3	0	3
VII	CHE 357		Separation Processes-I Lab	0	3	1
VIII	CHE 358		Chemical Engineering Thermodynamics Lab	0	3	1
			Total:	**14**	**06**	**16**

6th Semester

Paper	Course Code		Course Title	Lecture Hours	Lab. Hours	Credit Hours
I	CHE 361		Entrepreneurship	2	0	2
II	CHE 362		Separation Processes-II	3	0	3
III	CHE 363		Fuels & Combustion	3	0	3
IV	CHE 364		Technical Report Writing & Communication Skills	2	0	2
V	Elective – II	CHE 365A	Polymer Engineering	3	0	3
		CHE 365B	Natural Gas Engineering – II			
		CHE 365C	Renewable Energy Engineering			
VI	CHE 366		Separation Processes-II Lab	0	3	1
VII	CHE 367		Fuels & Combustion Lab	0	3	1
VIII	CHE 368		Unit Processes Lab	0	3	1
			TOTAL:	**13**	**9**	**16**

CHE 400 INTERNSHIP		**CREDIT HOURS : 0**

7th Semester

Paper	Course Code		Course Title	Lecture Hours	Lab. Hours	Credit Hours
I	CHE 471		Production & Operations Management	3	0	3
II	CHE 472		Process Instrumentation	2	0	2
III	CHE 473		Chemical Plant Design	3	0	3
IV	CHE 474		Transport Phenomena	3	0	3
V	CHE 475		Design Project Part I	0	3	1
VI	Elective – III	CHE 476A	Petrochemical Engineering	2	0	2
		CHE 476B	Petroleum Refinery Engineering –I			
		CHE 476C	Industrial Energy Systems			
VII	HUM 477		Industrial Psychology, Sociology and Tolerance	2	0	2
VIII	CHE 478		Transport Phenomena Lab	0	3	1
			Total:	**15**	**6**	**17**

8th Semester

Paper	Course Code		Course Title	Lecture Hours	Lab. Hours	Credit Hours
I	CHE 481		Industrial Management & Process Economics	3	0	3
II	CHE 483		Process Design and Optimization	2	0	2
III	CHE 484		Design Project Part II	0	3	3
IV	Elective – IV	CHE 485A	Biochemical Engineering.	3	0	3
		CHE 485B	Petroleum Refinery Engineering – II			
		CHE 485C	Food Engineering			
V	CHE 486		Process Dynamics & Control	3	0	3
VI	CHE 487		Chemical Plant Safety & Maintenance	2	0	2
VII	CHE 488		Instrumentation & Process Control Lab	0	3	1
			Total:	**13**	**6**	**17**

GRAND TOTAL CREDIT HOURS = 134

PROGRAMME STRUCTURE

FOR

B.Sc. (Engg.) Energy Engineering[2]

[2] Approved by syndicate vide letter No. 10377/Acad dated 04-12-2019

Semester - 1

Paper	Course Code	Course Title	Lecture Cr. Hr.	Lab Cr. Hr.	Total Cr. Hr.
I	EE 111	Energy Engineering Principles and Calculations I	3	-	3
II	PH 112	Physics for Scientists and Engineers	3	1	4
III	MA 113	Linear Algebra	3	-	3
IV	CY 114	Applied Chemistry (Organic & Inorganic)	3	1	4
V	CY 115	Environmental Chemistry	3	1	4
		Total	15	3	18

Semester - 2

Paper	Course Code	Course Title	Lecture Cr. Hr.	Lab Cr. Hr.	Total Cr. Hr.
I	CY 121	Physical & Analytical Chemistry	2	-	2
II	MA 122	Calculus & Analytical Geometry	3	-	3
III	EE 123	Coal Characterization	3	1	4
IV	HU 124	Pak Studies/ Islamic Studies/ Ethical Behavior	3	-	3
V	EE 125	Particle Technology	3	1	4
VI	CS 126	Computer Programming for Engineers	-	1	1
		Total	14	3	17

Semester - 3

Paper	Course Code	Course Title	Lecture Cr. Hr.	Lab Cr. Hr.	Total Cr. Hr.
I	EE 211	Heat Transfer	3	1	4
II	EE 212	Energy Engineering Principles and Calculations II	3	-	3
III	MA 213	Differential Equations	3	-	3
IV	HU 214	Technical English and Communication Skills	2	-	2
V	EE 215	Electric Power Systems	3	1	4
VI	EE 216	Environment and Pollution Control Systems	2	-	2
		Total	16	2	18

Semester - 4

Paper	Course Code	Course Title	Lecture Cr. Hr.	Lab Cr. Hr.	Total Cr. Hr.
I	MA 221	Engineering Numerical Analysis	3	-	3
II	EE 222	Reaction Engineering	3	-	3
III	EE 223	Engineering Materials	2	-	2
IV	EE 224	Fluid Mechanics	3	1	4
V	EE 225	Gas Engineering	3	1	4
		Total	14	2	16

Semester - 5

Paper	Course Code	Course Title	Lecture Cr. Hr.	Lab Cr. Hr.	Total Cr. Hr.
I	EE 311	Fuel Processing Engineering	3	1	4
II	EE 312	Simultaneous Heat and Mass Transfer	3	1	4
III	EE 313	Thermodynamics	3	1	4
IV	EE 314	Clean Coal Technologies	3	1	4
V	MS 315	Energy Conservation and Management	2	-	2
		Total	14	4	18

Semester - 6

Paper	Course Code	Course Title	Lecture Cr. Hr.	Lab Cr. Hr.	Total Cr. Hr.
I	EE 321	Thermal Power Generation Engineering	3	-	3
II	EE 322	Process Safety & Quality Control	3	-	3
III	EE 323	Plant Design	3	-	3
IV	EE 324	Instrumentation and Process Control	3	1	4
V	EE 325	Hydro Electric Power Engineering	3	1	4
		Total	15	2	17

Semester - 7

Paper	Course Code	Course Title	Lecture Cr. Hr.	Lab Cr. Hr.	Total Cr. Hr.
I	EE 411	Waste Treatment System Engineering	3	-	3
II	EE 412	Wind Power Engineering	3	-	3
III	EE 414	Solar Power Engineering	3	-	3
IV	EE 415	Thermochemical Conversion Technologies	3	-	3
V	EE 416	Solar & Wind Power Engineering Lab	-	1	1
V	EE 417	*Project I	-	3	3
		Total	12	4	16

*Carry over to next semester

Semester - 8

Paper	Course Code	Course Title	Lecture Cr. Hr.	Lab Cr. Hr.	Total Cr. Hr.
I	EE 421	Bio Fuel Technologies	3	-	3
II	EE 422	Waste to Energy Technologies	3	-	3
III	EE 423	Industrial Psychology and Sociology	3	-	3
IV	MS 424	Production and Operation Management	2	-	2
V	EE 425	Project II	-	3	3
VI	MS 426	Project Management	2		2
		Total	13	3	16

GRAND TOTAL CREDIT HOURS = 136

PROGRAMME STRUCTURE

Offered at

College of Engineering & Emerging Technologies

(1) B.Sc. (Engg.) Metallurgy & Materials Engineering

(a) B.Sc. (Engg.) Metallurgy & Materials Engineering

1st Semester

Paper	Course Code	Course Title	Lecture Hours	Lab. Hours	Credit Hours
I	HS 111	Functional English	3	0	3
II	NS 112	Applied Physics	3	1	4
III	NS 113	Calculus	3	0	3
IV	CS 114	Introduction to Computing and Computer systems	2	1	3
V	MME 115	Introduction to Metallurgy and Materials Engineering	2	0	2
VIII	HS 116	Islamic Studies/Ethics*	2	0	2
		Total	**15**	**2**	**17**

2nd Semester

Paper	Course Code	Course Title	Lecture Hours	Lab. Hours	Credit Hours
I.	ME 121	Engineering Drawing and CAD	1	1	2
II.	ME 122	Workshop practice	1	1	2
III.	NS 123	Applied Chemistry	3	1	4
IV.	ME 124	Engineering Mechanics	3	0	3
V.	HS 125	Pakistan Studies	2	0	2
VI.	MME 126	Metallurgical Engineering Calculations	3	0	3
VII.	NS 127	Differential Equations and Applied Techniques	3	0	3
		Total	**16**	**3**	**19**

*Only for non-Muslim students in place of Islamic Studies.

3rd Semester

Paper	Course Code	Course Title	Lecture Hours	Lab. Hours	Credit Hours
I.	HS 211	Communication skills and Report writing	3	0	3
II.	MIN 212	Mineral Processing	3	1	4
III.	CS 213	Numerical Analysis and Computer Programming	2	1	3
IV.	MME 214	Materials Thermodynamics and Kinetics	3	0	3
V.	MME 215	Materials Science	3	0	3
VI.	MME 216	Iron Manufacturing Technology	3	0	3
		Total	**17**	**2**	**19**

4th Semester

Paper	Course Code	Course Title	Lecture Hours	Lab Hours	Credit Hours
I.	MME 221	Mechanical behavior of Engineering Materials	3	1	4
II.	MME 222	Engineering Ceramics and Glasses	3	1	4
III.	MME 223	Physical Metallurgy	3	1	4
IV.	MME 224	Foundry Engineering-1	3	1	4
V.	HS 225	Critical Thinking	2	0	2
		Total	**14**	**4**	**18**

5th Semester

Paper	Course Code	Course Title	Lecture Hours	Lab. Hours	Credit Hours
I.	MME 311	Polymeric and Composite Materials	3	1	4
II.	MME 312	Foundry Engineering-II	3	1	4
III.	MME 313	Heat Treatment and Phase Transformation	3	1	4
IV.	MME 314	Steel Manufacturing Technology	3	0	3
V.	MME 315	Manufacturing Processes	3	0	3
		Total	**15**	**3**	**18**

6th Semester

Paper	Course Code	Course Title	Lecture Hours	Lab. Hours	Credit Hours
I.	MME 321	Corrosion Engineering	3	1	4
II.	MS 322	Industrial Safety and Environmental Engineering	3	0	3
III.	MME 323	Welding and Joining Processes	3	1	4
IV.	MME 324	Non-Ferrous Metallurgy	3	0	3
V.	CS 325	Computer Applications in Materials Engineering	2	1	3
		Total	**14**	**3**	**17**

7th Semester

Paper	Course Code	Course Title	Lecture Hours	Lab. Hours	Credit Hours
I.	MME 411	Surface Engineering and Tribology	3	1	4
II.	MS 412	Production and Quality Management	2	0	2
III.	MME 413	Advanced Materials	3	0	3
IV.	HS 414	Industrial Psychology and Sociology	2	0	2
V.	MME 415	Materials Characterization	2	1	3
VI.	MME 416^	Research Project	0	3	3
		Total	**12**	**5**	**17**

8th Semester

Paper	Course Code	Course Title	Lecture Hours	Lab. Hours	Credit Hours
I.	MS 421	Industrial Management and Process Economics	2	0	2
II.	MME 422	Instrumentation and Process Control	2	1	3
III.	NS 423	Statistical Methods and Estimation	2	0	2
IV.	MME 424	Powder Metallurgy	2	0	2
V.	MME 416^	Research Project	0	3	3
		Total	**8**	**4**	**12**

MME 416^ is the final year project which will spread over 2 semesters starting from 7th semester.

Total Credit Hours = 137

GENERAL REGULATIONS OF B.Sc. (ENGG.) DEGREE PROGRAMS

1. UNDER GRADUATE 4 YEARS B.Sc. (ENGG) PROGRAMME

i. There shall be two semesters in an academic year.
ii. Each semester will be of 18 working weeks: Sixteen weeks for teaching, one to two weeks for the conduct of examinations.

2. COURSE DESCRIPTIONS

Course contents, if revised, will be approved by the Board of Studies of the concerned department/faculty Board and Academic Council. The teachers concerned will be responsible for determining the details of the course. The Director/Chairman shall call the meeting of the teachers of the department for the purpose.

3. COURSE CREDITS

i. A minimum 124 credits are required for the 4 Years degree program. The said credits shall normally be earned in eight semesters.
ii. The minimum number of contact hours in a course will be 15 per semester for one credit hour course.
iii. A course may range from one credit hour to four credit hours.
iv. One credit hour stands for at least one hour class contact per week per semester. For practical/laboratory work 3 hours shall be considered equivalent to one credit hour.
v. Six (06) credit hours Research Project (dissertation) / project report / internship / special paper will be offered in the third and fourth years.

4. CLASS ATTENDANCE

i. A student must have attended at least 75% of the classes held in a course in order to be allowed to sit in the final examination.
ii. In case of absence as a result of late admission, medical grounds or change of course, the teacher will give extra (make-up) materials to the student to compensate the deficiency because of said absence.
iii. In case the student remains absent from the class for seven consecutive lectures without leave his/her name shall be removed from the rolls.

5. EVALUATION SYSTEM

i. The weightage of the test and assignment/sessional work will be as follows:

(a) Mid Term (test) 35%
(b) Assignment 25%
(c) Final Term (test) 40%
(d) To pass a course a student must obtain ‘D’ grade (50% marks) Cumulative in Assignments, Mid and Final Semester Examinations.

6. Duration of Examinations

In view of the weightage for the various examinations, the duration of the papers will be as follows:

Term	Theory	Practical
Mid-Term Examination	One and half hour	As mentioned in the Time-Table
Final Term Examination	Two hours	--

7. Home assignments shall be deposited with the teacher concerned as scheduled by the teacher.

8. Re-sit Examination on Medical Ground: In case a candidate is unable to appear in part or whole of the (Mid-Term/Final) Examination of a semester on medical grounds, he may be allowed to appear in the special examination (Mid-Term/Final) to be arranged by the Department/ Institute/College, provided;

i) He/She fulfils the condition of having attended the prescribed number of lectures as laid down in Regulation 4(i & ii).

ii) He/She is admitted as patient in a recognized Hospital, or if he/she is not hospitalized, as defined above, the candidate will be examined by the University Medical Board comprising Chief Medical Officer and senior most Medical Officer of the University.

9. Grading System

1. Letter grading should only be used for representing the individual courses and not for semester GPA or CGPA.
2. Equivalence in letter grades and grade points will be as follows:

Letter Grade	Grade Points
A	4.00
A-	3.70
B+	3.30
B	3.00
B-	2.70
C+	2.30
C	2.00
C-	1.70
D	1.00
F	0.00

3. Maximum possible Grade Point Average is 4.00
4. Minimum Cumulative Grade Point Average is 2.00.
5. Calculation Grade Point Average (GPA) for a Semester.
   In order to calculate the GPA, multiply Grade Point with the Credit Hours in each course to obtain total grade points, add up to cumulative Grade Points and divide by the total number of Credit Hours to get the GPA for the Semester.
   Course with 'F' will be counted as 'Zero' Grade Point for calculation of semester Grade Point Average. Calculation of cumulative grade point average will only be made when a candidate has passed all the courses required for the award of degree.
6. The percentage of marks or values of grades other than given grade points should not be reported on the transcripts.

10. Rules for Promotions

1. At the end of the first Semester a student must obtain a minimum Grade Point average (GPA) of 2.00 to be promoted to the second semester.
2. In case a student is able to obtain GPA of 1.70 or more but less than 2.00 he /she will be promoted to the second Semester on probation (I^{st} probation). The candidate, who fails to secure 1.70 GPA in the first semester shall stand automatically dropped from the rolls of the Department /Centre/Institute/College.
3. At the end of second semester, a student must obtain a minimum Cumulative Grade Point Average (CGPA) of 2.00 and must also pass at least 50% of the courses offered; by him/her in order to be promoted to the third semester. If the student does not achieve desired CGPA 2.0 but obtain CGPA > 1.7 will go to 2^{nd} (last) probation.
4. In all the following semesters a student has to maintain CGPA 2.00 for his /her promotion otherwise he/she will be removed. If a student has not availed opportunity of probation during the first two semesters then he/ she will have the right to avail probation twice in the following semesters.
5. In the third semester a student will be required to repeat those courses of the first semester in which he / she had failed.
6. In the fourth, sixth and eighth semester, a student will be required to repeat those courses of the second, fourth, sixth and /or eighth semester in which he/she had failed.
7. If a student gets D grade, he/she can repeat the course when offered to improve his/her grade.
8. A student, who completes all the courses and has not been required to repeat any course(s), obtains CGPA of less than 2.00 but not less than 1.90 at the end of 8^{th} semester may be allowed to repeat course (varying from 2 to 4 credit hours) in which he / she had obtained the lowest grades, in order to improve the CGPA so as to obtain the minimum of 2.00 CGPA failing which he / she shall not be awarded degree and removed from the rolls of the Department /Centre / Institute / College.
9. In case a student repeats the course which he / she have already taken, the old grades will be substituted with the new grades for CGPA calculations.
10. A student will be allowed to repeat a maximum of 18 credit hours courses.

11. Calculation of Final Result

1. Minimum requirements for the award of 4 years B.Sc. (Engg.) Degree

   i) A candidate must have qualified in accordance with the existing Rules and Regulations in each one of the I,II,III,IV,V,VI,VII and VIII Semesters, separately, i.e. by securing at least a 'D' in all course as to fulfill he requirements laid down in (ii) below:

   ii) He/She must have earned the prescribed number of credits required for the 4 years degree i.e., a minimum of 132 credits.

   iii) He/She must have obtained a minimum Cumulative Grade Point Average of 2.00.

   iv) He/She must have obtained 4-6 weeks industrial training.

2. Method for Calculation of the Final CGPA.

   i) Add up Cumulative Grade Points of each semester to obtain grand total and then divide the grand total by total no. of credits of the courses studied. The resulting figures will represent the Cumulative Grade Point average secured by a candidate. The CGPA will be reported up to two decimals but for the determination of merit position CGPA will be calculated up to any decimal.

   ii) The students obtaining CGPA of 3.70 or above will be declared eligible for role of honors

   iii) For the award of Gold Medal or some other award(s), the Ist position will be calculated on CGPA basis of the whole course.

   iv) For the award of Gold Medal, roll of honors and all other distinction of Punjab University, a student must have passed all the examinations at least in B Grade, in the first attempt.

NOTE

(Applicable to the schedule of all programmers)

- **The candidate is required to see the lists of Selectees and schedule of payment of dues on the Notice Board of the Institute of Chemical Engineering & Technology. He/She will not be provided/sent the above-mentioned information by the Faculty 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 Faculty. 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 Faculty, therefore, reserves the right to change/amend any rule/s and regulations applicable to students whenever it is deemed appropriate or necessary.

Faculty of Engineering & Technology

University of the Punjab, Quaid-i-Azam Campus, Lahore-Pakistan
Tel: +92-42-99231261, 99231160
http://www.pu.edu.pk

Printed by:
Department of Press & Publications, University of the Punjab, Lahore