M.Sc. Telecommunication Networks

ZTE-UET
Telecommunication Center

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UNIVERSITY OF ENGINEERING AND TECHNOLOGY

Though this institution received its charter as a University in the year 1961, it has a much longer history as a distinguished seat of learning in the engineering sciences. It started its career in 1921 as the Mughalpura Technical College, deriving its name from the famous suburb of the old city of Lahore, richly dotted with architectural heritage of the great Mughals including the magnificent Shalimar Gardens. Its more familiar name of the pre-University era, the Maclagan Engineering College, was given to it in 1923 when Sir Edwards Maclagan, the then Governor of the Punjab, laid the foundation stone of the building, now called the Main Block, which still retains its majesty in spite of the wear and tear of over eight decades. At that stage the institution offered courses of study in two disciplines, namely Electrical and Mechanical Engineering. The year 1932 is a major milestone in the evolution of this institution when it was affiliated with the University of the Punjab for award of a Bachelor's Degree in Engineering. At the dawn of Independence in 1947, it had well-established B.Sc. Degree courses in civil, electrical and mechanical engineering, and the quality of its scholastic standards won it a place of prestige throughout the British India.

In 1954 it started a Bachelor's Degree course in Mining Engineering, the first-ever of its kind in the country. But its massive expansion and development commenced in 1961 on its transformation into a University. It set for itself a variety of goals, but the first priority was to start teaching of those disciplines that were crucial for national development but were not catered for by any institution in the country. Accordingly, in the sixties, Bachelor's degree courses were started in Chemical Engineering, Petroleum and Gas Engineering, Metallurgical Engineering, Architecture and City and Regional Planning.

Later, the University concentrated its energies and resources on developing its postgraduate programs. By 1970's it had established over a score of Master's Degree Courses in diverse specializations of engineering, architecture, planning and allied disciplines. Ph.D. Degree program was also instituted in a number of disciplines. The process of consolidating and strengthening continued to be a major concern of the University, with phenomenal increase in students' enrollment in seventies. Consequently, the University College of Engineering, Taxila was established in 1975. For three years it functioned at Sahiwal and was shifted to its campus at Taxila in 1978. This college has now been upgraded to University of Engineering and Technology, Taxila.

Establishing traditions of research in the engineering and allied disciplines has been a major goal of the University. With this end in view, the University established a Directorate of Research, Extension and Advisory Services that strives for the promotion and organization of research activities.

In the recent past there has been a substantial rise in students enrollment and the figure has now gone up to about 9,700. Over 1,876 students are pursuing postgraduate studies. The number of female students enrolling for different disciplines is ever on the increase, and is 1,832 at present. The number of foreign students coming from countries, like Iran, Jordan, Kuwait, Kenya, Nepal, Saudi

Arabia, Iraq, Bangladesh and Sri Lanka is over 286 which gives the University Campus a cosmopolitan character.

The teaching departments of the University are grouped into the following six faculties:

1. Faculty of Electrical Engineering
2. Faculty of Mechanical Engineering
3. Faculty of Civil Engineering
4. Faculty of Architecture & Planning
5. Faculty of Chemical, Mineral & Metallurgical Engineering
6. Faculty of Natural Sciences, Humanities and Islamic Studies

The university has 779 teachers of which 157 are Ph.D. degree holders, 210 are doing Ph.D. abroad and 80 are going through indigenous Ph.D. program. The University set up a campus at Faisalabad in 2006. So far, four batches have graduated from this campus. UET has also established a campus at Kala Shah Kaku known as University City Campus where admission started in 2007. Rachna College of Engineering and Technology, Gujranwala is a constituent college.

The university is establishing a new campus in Narowal aiming to produce quality technical manpower for the District of Narowal and its surroundings.

In addition to managing its own campus, the University controls the academic programs and examinations of the following institutions that are affiliated to it for award of degrees:

- NFC Institute of Engineering and Fertilizer Research, Faisalabad
- Garrison Science Degree College Lahore Cantt.
- Swedish College of Engineering and Technology, Rahim Yar Khan
- Government College of Technology, Railway Road, Lahore
- Government College of Technology, Faisalabad
- Government College of Technology, Bahawalpur
- Government College of Technology, Rasul
- Sharif College of Engineering and Technology, Raiwind Road, Lahore
- Dr. A. Q. Khan Institute of Technology, Mianwali

DEPARTMENT OF ELECTRICAL ENGINEERING

The Department of Electrical Engineering was established in 1923 as a part of the Mclagan Engineering College. The Department started a postgraduate program in 1966 and currently around 450 students are pursuing their Masters or PhD in Electrical Engineering. The first Master's Degree was awarded in 1969 and the first Doctoral Degree was awarded in 1979. The student can choose amongst one of the following specializations while pursuing his Master's in Electrical Engineering – (a) Electronics and Communications, (b) Computer, (c) Control and (d) Power.

The Department is offering a Masters degree in Telecommunication Networks.

The Master's degree courses are aimed at bringing the students abreast with the most recent developments in this field. For graduation, besides doing a thesis (equivalent to six credit hours) a student needs to pass six core courses within the first two semesters and two elective courses in the third semester – list of all courses is provided below. It is mandatory for all students to pass the GRE General type test administered by the National Testing Service (NTS).

Research work being carried out at the Department has direct bearing on the needs of national industry. The Directorate of Research Extension and Advisory Services of the University, in particular, fund this research. A number of research papers are produced every year by faculty members and graduate students, which are normally published (presented) in major national and international journals (conferences).

The Department established a Postgraduate Research laboratory in 1993 which houses a large collection of powerful computers and numerous books donated by late Dr Masood Ahmad.

The Department has a well-stocked and up-to-date library for the use of the faculty and students. The Department also offers consultancy services and testing facilities to local manufacturers of electrical and electronics equipment. It also arranges frequent seminars and workshops in various areas of electrical, electronics, computer and control system engineering. Faculty members, postgraduate students and prominent researchers from home and abroad deliver these seminars.

COURSES OFFERED

It is mandatory for all students to take the following six courses in the first two semesters of their registration in the program:

Course Number	Course Name	Units
TN-510	Computer Networks and Internets	3 + 0
TN-511	Operating System Concepts	3 + 0
TN-520	Mobile Communications	3 + 0

Table-1: Three Core Courses for Semester I

TN-510: Computer Networks and Internets
Credits: 3 + 0
Pre-Requisite: None

This course focuses on layered based perspective. It facilitates the students to conduct independent research in the field of networking. The topics covered include: Computer Networks and the Internet, Application Layer, Transport Layer, The Network Layer, The Link Layer and Local Area Networks, Wireless and Mobile Networks, Multimedia Networking.

Recommended Texts: Computer Networking: A Top-Down Approach, by J. Kurose and Ross, 6th Edition, Addison-Wesley, 2012 and Computer Networks by Andrew S. Tanenbaum and David J. Wetherall, 5th Edition, Prentice Hall, 2010.

TN-511: Operating System Concepts
Credits: 3 + 0
Pre-Requisite: Computer Networks

Students will learn to develop complex system-level software in C for Internet applications while gaining an intimate understanding of the UNIX operating system, its system calls, and its programming environment. Topics covered include user/kernel interface, basic and advanced file I/O, process control, signals, thread control, interprocess communication, TCP and UDP protocols, TCP and UDP sockets, daemon processes, multicasting, and p-threads etc. Time permitting, there will be an introduction to socket programming.

Recommended Texts: Operating System Concepts by Silberschatz, 8th Edition, Addison-Wesley, 2011. Advanced Programming in Unix Environment, by Richard Stevens and Stephen A. Rago, 2nd Edition, Addison-Wesley, 2005.

TN-520: Mobile Communications
Credits: 3 + 0
Pre-Requisite: None

The topics covered include: GSM, GPRS and Cdma1X theory, key technologies, channel structure, signal flow, hardware structure of base station and base station controller, function of each board, commissioning of BTS and BSC, operation and maintenance, networking, OMC main features and functions and introduction to core network.

Recommended Texts: Wireless Communications by Andreas F. Molisch, 2nd Edition, Wiley, 2011, GSM Networks: Protocols, Terminology and Implementation

by Gunnar Heine, Artech House**,** 1998, GSM, CDMAOne and 3G Systems by R Steele, C-C Lee and P Gould, Wiley, 2001.

Course Number	Course Name	Units
TN-512	Advanced Enterprise Networks	3 + 0
TN-521	Advanced Mobile Communications	3 + 0
TN-522	Optical Networks	3 + 0

Table-II: Three Core Courses for Semester II

TN-512: Advanced Enterprise Networks
Credits: 3 + 0
Pre-Requisite: None

The course aims to give students a broad insight into the advanced network technologies and their wider use within and outside a large business environment. Topics covered include: Role of Enterprise Networking Systems (ENS) in contemporary business practice and technologies; role of the Internet for business applications; principles of basic telecommunications necessary for ENS understanding; The Local Area Network (LAN) as a fundamental component of ENS; The Wide Area Network (WAN) as a fundamental component of ENS; inter-networking technologies used in ENS; advanced client-server models for ENS; web based technologies and standards; ENS management and ENS design.

Recommended Texts: Broadband Telecommunications Handbook by Regis J. Bates, 2nd Edition, McGraw Hill, 2002

TN-521: Advanced Mobile Communications
Credits: 3 + 0
Pre-Requisite: Mobile Communications

This course covers: WCDMA, CDMA-EVDO, WiMax and LTE theory, key technologies, channel structure, signal flow, hardware structure of Node-B, RNC, Macro, Micro and Pico BS, function of each board, commission, O&M, networking and introduction to core network.

Recommended Texts: GSM, CDMAOne and 3G Systems by R Steele, C-C Lee and P Gould, Wiley, 2001, Introduction to 3G Mobile Communications by Juha Korhonen, 2nd Edition, Artech House, 2003, Fundamentals of WiMax – Understanding Broadband Wireless Networking by J G Andrews, A Ghosh and R Muhamed, Prentice Hall, 2007.

TN-522: Optical Networks
Credits: 3 + 0
Pre-Requisite: None

This course covers: Synchronous Digital Hierarchy (SDH) and Dense Wavelength Division Multiplexing (DWDM) principles, Multi-Service Transport Platform (MSTP) introduction, SDH and DWDM equipment hardware, SDH and DWDM network O&M solution and optical network analysis using advanced simulation tools.

Recommended Texts: Optical Networks – A Practical Perspective by Rajiv Ramaswami, Kumar N. Sivarajan and Galen H. Sasaki, 3rd Edition, Morgan Kaufmann, 2009.

Elective Courses

In addition to the mandatory industry related project the student has an option to choose from any three of the following courses in his third semester:

Course Number	Course Name	Units
TN-5ab	Elective-I	3 + X
TN-5cd	Elective-II	3 + X
TN-599	Thesis	0 + 6

Table-III: Elective Courses for Semester III

Course Number	Course Name	Units
TN-562	Broadband Access Network	3 + 0
TN-563	Network Operations and Management System	3 + 0
TN-564	RF Engineering	3 + 0
TN-533	Network Security and Cryptography	3 + 0
TN-534	Database Systems and Applications	3 + 0

Table-IV: List of Elective Courses

TN-562: Broadband Access Networks

Credits: 3 + 0

Pre-Requisite: None

The topics covered include: advanced broadband access techniques, DSL principle, DSLAM network solution, network capacity configuration, access gateway techniques, MSAG application in NGN and introduction to switching in fixed networks.

Recommended Texts: Packet Broadband Network Handbook – Architecture, Performance, and Engineering by Haojin Wang, McGraw Hill, 2002

NST-563: Network Operations and Management System

Credits: 3 + 0

Pre-Requisite: None

The subject involves an overview, protocol description and tool design of network monitoring and control systems. SNMP network management being an essential and widely adopted management protocol is the emphasis of the subject. Management Information Base (MIB), its configuration, agent-manager relationship, ANS.1 etc are some of SNMP highlights. Network infrastructure administration, implementing, managing and maintaining a network infrastructure of ISPs using AAA and RADIUS servers shall be addressed. The algorithmic implementation of monitoring tools involving RMON, TRTG, traffic capture and analysis using Intrusion Detection Systems (IDSs) would be covered.

Recommended Texts: SNMP, SNMPv2, and RMON: Practical Network Management by William Stallings, 2nd Edition, Addison-Wesley

NST-564: RF Engineering
Credits: 3 + 0
Pre-Requisite: Mobile Communications

The topics covered include: wireless network planning process, RF environment introduction and propagation model, antenna and feeder system, link budget, capacity theory, site survey, network optimization process, signaling trace, access optimization, handoff optimization, power control optimization, drop call optimization, drive test, and introduction to advanced tools for network planning, simulation and optimization.

Recommended Texts: RF Engineering for Wireless Networks by Daniel M Dobkin**,** Newnes, 2004, Cellular Mobile Radio Systems: Designing Systems for Capacity Optimization by Husni Hammuda, Wiley, 1998 and Designing a Wireless Network: Understanding How Wireless Communication Works by J Wheat, R Hiser, J Tucker, A Neely and A McCullough, Syngress, 2001

NST-533: Network Security and Cryptography
Credits: 3 + 0
Pre-Requisite: Computer Networks

The topics covered include: introduction and historical background, basic techniques of encryption, private key encryption and public key encryption, prime number generation, Cryptographic standards, Symmetric Ciphers and Encryption Schemes, Hash Functions, DES,AES and RSA algorithm, Authentication, Signature schemes, Elliptical Curve Cryptography, chaos masking method and chaos shift keying. Information rate and construction of efficient cryptoschemes

Recommended Texts: Cryptography and Network Security: Principles and Practice by William Stallings, 5th Edition, Prentice Hall, 2010, An Introduction to Cryptography by Richard A. Mollin, 2nd Edition, Chapman & Hall/CRC, 2006 and Cryptography: Theory and Practice by Douglas R. Stinson, 3rd Edition, Chapman & Hall/CRC, 2005

NST-534: Database Systems and Applications
Credits: 3 + 0
Pre-Requisite: None

This course covers database systems, architecture, management and their applications. Principles and methodologies of database design and techniques for database application development are also covered. Topics covered include: data dictionaries, normalization, data integrity, modeling, and creation of queries, forms, reports and tables.

Recommended Texts: Database System Concepts by A. Silberschatz, H. Korth and S. Sudarshan, 6th Edition, McGraw Hill, 2010.

NST-599: Thesis
The student is expected to explore solutions to problems that a service provider experiences.

REGULATIONS GOVERNING THE SEMESTER SYSTEM OF TEACHING AND EXAMINATIONS FOR POSTGRADUATE DEGREE PROGRAMS

1. Introduction

The following regulations govern the semester system of teaching and examination for the Masters in Telecommunication Networks degree awarded by University of Engineering and Technology (UET), Lahore

- Masculine gender used in the following regulations implies students of either gender, that is, male students as well as female students
- The medium of instructions and examinations shall be English for all subjects
- The term "Academic Year" refers to the period of study at the university spread over one calendar year long period. Academic year is further divided into semesters
- The term "Credit Hour (CH)" refers to a unit of academic credit during a semester. Each credit hour is related to a one or more "Contact hours per week" according to subject type as defined in these regulations
- A "calendar year", commences from Spring semester and includes two regular semesters.

2. Degree Duration
   - The duration for the degree is one-and-a-half calendar years from the date of registration

3. Students Status
   - Postgraduate students shall be classified as "Regular" students while enrolled at the university during the minimum duration of their respective degree program

4. Credit Hours Requirement
   - The minimum credit hours requirement for the award of the degree shall be 32 credit hours after an undergraduate degree

5. Semesters Nomenclature and Duration
   - There shall be two regular semesters, namely Fall and Spring semesters, during each academic year
   - Duration of fall and spring semesters shall be of 16 to 18 weeks

6. Curriculum and Classification of Subjects
   - The curriculum, subject identification numbers, the credit hours allocated to each subject and detailed syllabus shall be according to the proposals made by the Board of Studies and the Board of Faculty concerned and approved by the Syndicate on the recommendations of the Academic Council
   - Subjects are classified as:
     - "Theory" wherein the primary mode of teaching shall be lectures given by teachers supplemented by home assignments. For the purpose of these regulations, subjects of this type shall be referred to as Type-A

- "Practical" wherein the primary mode of teaching shall be experiments, studio laboratory, designs, drawings, assignments and projects conducted/executed by students as specified in the syllabus. For the purpose of these regulations, subjects of this type shall be referred to as Type-B
- Postgraduate theses shall also be classified as Type-C subjects.

7. Type-A Subjects Evaluation and Contact Hours
   - In Type-A subjects, there shall be a mid-term examination of one hour duration and a final examination of at least one and a half hour duration. These examinations shall carry 30 and 40 percent weight, respectively. The teacher shall schedule additional assessment instruments such as quizzes, assignments, presentations, seminars, group discussions, field study reports etc. as specified in the syllabus or as determined by the teacher. These assessment instruments shall carry the remaining 30% weight of the subject
   - There shall be one contact hour per week for the duration of a regular semester for each credit hour assigned to Type-A subjects

8. Type-B Subjects Evaluation and Contact Hours
   - In Type-B subjects, each Experiment, Studio work, Jury Presentation, Design, Drawing, Project or Assignment shall be considered an independent assessment instrument. Relative weight of each independent assessment instrument shall be determined by the concerned teacher in computing the cumulative performance, on a scale of 100, of all assessment instruments completed during the regular semester
   - There shall be two to three contact hours per week for the duration of regular semester for each credit hour assigned to Type-B subjects

9. Type-C Subjects Evaluation
   - Postgraduate theses evaluation process would be followed as prescribed in relevant approved postgraduate regulations

10. Award of Letter Grades
    - The subject teacher shall award letter grades to the students in consultation with the Chairman of the concerned degree awarding department. Letter grade in each Type-A subject shall be awarded on a Relative Scale whereas, letter grade in Type-B and Type-C subjects may be awarded on an absolute scale if deemed fit by the subject teacher
    - Following steps in awarding letter grades on a relative scale shall be followed:
      - Minimum marks threshold linked to content mastery shall be established for award of a passing letter grade. Students earning marks below this threshold shall be awarded "F" grade
      - Students earning marks above the minimum threshold are listed in descending order of merit. Passing letter grades are awarded based on a normal curve or any other method as deemed suitable, according to the table given below, with "A+" being the highest passing grade and "D" being the lowest passing grade
      - An upper limit on percentage of students in a subject who can earn a particular passing grade may be placed, if required.
    - The letter grades and their corresponding grade points (GP) are given in the

table below:

A+	A	B+	B	B-	C+	C	C-	D	F	W	WF	I
4.0	3.7	3.3	3.0	2.7	2.3	2.0	1.7	1.0	0	-	-	-

Table-I: Letter Grades & Corresponding Grade Points

- Subjects repeated to improve grades, excluding "W" or "WF" grades, will be shown on the transcript with a suffix "R".

11. Result Computation Scheme
    - The Grade Point Average (GPA) and Cumulative Grade point Average (CGPA) shall be computed according to the following formula:

$$GPA = \sum_{x=1}^{n} (GP_x \times CH_x) \Big/ \sum_{x=1}^{n} CH_x$$

where *n* is the number of subjects in the semester for which GPA is computed

$$CGPA = \sum_{x=1}^{m} (GP_x \times CH_x) \Big/ \sum_{x=1}^{m} CH_x$$

where *m* is the number of total subjects covered in all semesters up to the semester for which CGPA is to be computed.

12. Award of "W" , "WF" and "I" Grades
    - Withdrawal
        - This option to withdraw shall be available only to students in regular semesters other than first and second semesters
        - A student may be allowed to withdraw from a subject in which he is registered. Applications to withdraw from a subject shall be entertained latest up to the 9th study week of the semester. Withdrawn subjects shall appear in the transcript with a letter grade "W", and shall not be used in computation of GPA. In the transcript, subjects repeated after withdrawal will not be suffixed with a "R".
    - Forced Withdrawal: A student registered in a subject may not be permitted to continue due to shortage of attendance or other disciplinary action. Such students shall be awarded a “WF” (Forced Withdrawal) grade. It shall appear in the transcript as such, and shall not be used in computation of GPA. Subjects repeated after forced withdrawal shall not be suffixed with a “R”
    - Postgraduate students may withdraw from at most 6 credit hours during the duration of their study. "WF" grade shall be counted as "W" grade for the purpose of this allowance
    - Incomplete Grade: The students shall be awarded “I” (Incomplete) as an interim grade until the completion of unfinished subjects. This grade shall appear in the transcript as such, and will not be treated as "F" grade. Situations when award of "I" (Incomplete) grade becomes necessary are enumerated below:
        - Type-C subject, like theses, spread over more than one semester shall be graded as "I" until completion of this subject

- A student, who because of illness or any other acceptable reason approved, after verification, by the concerned Chairman, fails to complete the required instruments in any subject, shall be awarded an "I" (Incomplete) grade as an interim grade. The student receiving such a grade shall make up the unfinished portion of his subject to the satisfaction of the faculty member who awarded this grade, and is given a letter grade as per regulation "Award of Letter Grades" at the discretion of the faculty member without prejudice to the previous grade "I". In case, the student fails to complete the unfinished portion within one calendar year from the date of end of the semester in which he was awarded the "I" grade, his "I" grade would be automatically converted to "F" grade. The responsibility for completing the unfinished portion and satisfying the faculty member lies with the affected student

13. Repetition of Subjects
    - The student shall have to earn a passing letter grade in failing and withdrawn core subjects. They may study alternate elective subject for completing the credit hours requirement if they have earned "W" in an elective subject. Students are permitted to improve grades of passed subjects along with any outstanding "F", "W" or "WF" grade, subject to maximum credit hours restriction, if any. Concurrent registration means the registration to improve grades of passed subjects along with subjects having "F", "W" or "WF"grades
    - In case of repetition of a subject, the new grade earned shall replace the previous grade, whether high or low. At the time of graduation, elective subjects with "W" grade will not be shown on the final transcript if alternate elective subjects have been studied for completing the credit hours requirement
    - Postgraduate students shall repeat subjects whenever they are offered

14. Removal From Rolls
    - Postgraduate students shall be dismissed from the program:
        - if they do not register in any subject during the first semester after their enrollment
        - if they register for less than 6 subjects during the first two semesters after enrollment
        - if they earn a CGPA of less than 2.5 after first two semesters at the university

15. Official Authority for Computation of Result
    - Grade points (GP) in each subject, Semester Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) of each student shall be computed and notified by the Controller of Examinations at the end of each semester
    - Provisional results displayed/communicated to the student in the department after approval of the chairman before publication of official results may be used for deciding removal cases and for registering students for repetition of subjects by the departments

16. Award of Degree
    - M.Sc. degree shall be awarded to those students, who have:

- Earned a minimum CGPA of 3.0 in prescribed course work with no outstanding "F", "W", "WF" or "I" grade in core courses
- Have repeated elective subjects in which they have earned "F", "W", "WF" or "I" grade, or have taken alternate elective subjects to complete the subjects credit hours requirements
- Completed a thesis as per prescribed requirements

17. Grade Change Request
    - A student may submit a Grade Change Request to the Chairman's Office stating the specific reason for change in grade. Grade Change requests must be submitted not later than one week after the first grade was posted or within the first week of the following semester, whichever is later. The request will be routed to the concerned faculty member. Normally, the only person who can change a grade is the faculty member who gave the grade; however, in case that faculty member is no longer available or cannot be reached, the department Chairman has the authority to evaluate the situation and change a grade, if required. When a grade is to be changed, the chairman shall forward the case to the Dean with justification for change. The result will be modified after approval of the Vice Chancellor on the recommendation of the Dean

18. Registration of Students, Fee Payments and Hostel Accommodation
    - The students shall be registered for subjects being offered in a regular semester. Such students shall pay prescribed University dues during the minimum duration of their degree program. Students deferring studies during this period shall continue to pay university dues as regular students during deferral period
    - Chairman of each department shall register regular and repeating students in subjects being taught during that semester in his department. The Chairman has the authority to block registration of repeating students beyond a certain number of credit hours keeping their past performance in perspective
    - Registration roll in each subject of the semester shall be dispatched to the Controller of Examinations within first fifteen days of the beginning of each semester

19. Deferment of Studies (Freezing) for Students
    - Students enrolled in the first semester or second semester cannot apply for deferment
    - There shall be no relaxation in the maximum degree duration period for students seeking deferment
    - A student may defer studies for at most two consecutive regular semesters, for medical or other genuine reasons. In such cases, the student shall apply to the Chairman concerned, at least 15 days before the commencement of the semester, for approval of deferment by the concerned Dean. CAC, after approval, shall notify deferment for a specified period

20. Attendance Requirements
    - Students failing to register, or attend classes, or failing to re-join after expiry of approved deferment, during the first three weeks after commencement of a semester or after the date of their admission in case of new entrants in the first semester (i.e., Spring), shall have their admission canceled automatically

- Students failing to maintain a minimum attendance of 85% in a subject during a semester shall be awarded a "WF" grade. Chairman in consultation with the respective Dean shall review cases of students seeking relaxation of up to 10% in attendance requirement. The relaxation shall be allowed after approval by the Dean

21. Re-Admission on Expulsion due to Absence
    - Excluding students dismissed under Regulation 14, students whose admission has been canceled due to absence, can appeal to the Vice Chancellor for re-admission, within one year from the cancellation of their admission, as transfer students

22. Eligibility Criteria
    - Applicants should have successfully earned:
        - a CGPA of 3.0 out of 4.0 in a semester system in a four-year B.Sc. Engineering program in the relevant field, or
        - at least 65% in a term or annual system in a two years B.Sc. program (Double Maths and Physics, or Double Maths and Stats) plus at least 65% in a term or annual system in a two years M.Sc. Telecom or M.Sc. Computer Science program

23. Selection Criteria
    - According to existing UET admission criterion – weighted average of sixteen years of education (60%) plus aptitude test/interview (40%).

24. Special Provisions
    - In all cases where the regulations are silent, the decision of the Vice Chancellor shall be final
    - Interpretation of these rules and regulations by authorized officers of the University shall be final
    - The University authorities reserve the right to make any changes in the existing regulations, rules, fee structure and courses of study that may be considered necessary at any time without prior notice
    - No student is allowed to maintain simultaneous enrollment in any other program of studies in the university or any other educational institution within or outside Pakistan, unless permitted by the competent authority as an Exchange Student
    - In case a student enrolled in this University is found to be a regular student of some other university/institution whether local or foreign, his admission in this university shall be canceled
    - Students are required to know the rules and regulations mentioned in the prospectus and notified time to time. Ignorance of rules and regulations does not absolve them of their responsibilities and shall not be treated as an excuse.

RULES

1. Evaluation Process of Subjects
   - Evaluation of Type-A Subjects
     - For mid-term and final examinations of Type-A subjects, the teacher of a subject shall set the question paper of that subject, supervise its examination, mark the answer books and prepare the award list
     - Every teacher of Type-A subjects shall return the marked quizzes, assignments, etc. and mid-term examination scripts to the students for review, and in case of presentations etc. display the earned score of each student, within one week of the event. Mid-term scripts, however, would be recovered from the students and deposited with the chairman concerned
     - At the end of scheduled teaching period of a semester but before commencement of the final examinations, the teacher shall prepare and display the Interim Award List. Composition, display, correction, and reporting requirements/procedures of Interim Award List shall be as prescribed in these rules
     - Teachers would mark the final examination scripts, and prepare and display Comprehensive Award List within one week of the examination of the subject
     - The students may be shown the final examination marked scripts before submission of Comprehensive Award List to the Controller of Examinations, if they so desire

   - Evaluation of Type-B Subjects
     - Teachers of Type-B subjects shall keep all students informed of their performance at every stage in each category of task performed. Immediately after the end of each stage/assessment event, teachers shall prepare and display a list of earned score of each student in that stage/assessment event
     - At the end of semester and before the end of examination period, teachers shall prepare and display the Interim Award List. Content and other requirements regarding Interim Award List shall be as prescribed in these rules
     - After following the procedures and requirements regarding Interim Award List, the teachers shall prepare and display Comprehensive Award List within one week of the end of the scheduled teaching period.

   - Evaluation of Type-C Subjects
     - For postgraduate theses, evaluation process would be followed as prescribed in relevant approved postgraduate regulations

   - Interim Award List
     - Interim Award List would show the percentage as well as weighted score of each stage/assessment instrument of that subject including the

mid-term examination in case of Type-A subjects
    - One copy of the list shall be submitted to the Chairman and additional copies shall be displayed on the Notice Boards for at least two working days to permit students to point out any anomalies, errors, omissions etc. in the list
    - The teachers shall give due consideration to any anomalies, errors, omissions etc. in the list pointed out by any student, and may correct the list. Any corrections etc. in the list shall be reported by the teacher to the Chairman
    - Any further processing of the list shall be carried out only after it has been displayed on the Notice Boards for the mandatory period and decisions regarding all matters pointed out by students have been taken.

- Comprehensive Award List
    - The Comprehensive Award List shall show, for each student:
        - The Comprehensive award showing weighted combination of the Interim Award and Final Examination award in percentage format and
        - Letter Grades corresponding to the comprehensive award
    - The teacher would assign letter grades to the comprehensive award in consultation with the chairman as prescribed in the rules
    - The Comprehensive Award List shall be displayed on the notice boards for students to see and discuss anomalies, if any
    - One copy of the Comprehensive Award List shall be sent to the Controller through the Chairman of the Department and one copy each shall be retained by the chairman and the teacher

2. Conduct of Examination of Type A Subjects Under Semester System
    - Question Papers
        - All question papers are set by the concerned teacher
        - The paper setters, who also ensure their correctness, supervise the photocopying or duplicating of the papers
        - Question papers are kept in the safe custody of the teacher till the start of examination. He shall bear legal and moral responsibility for the safe custody and secrecy of the question papers

    - Reference Material during Tests/ Examinations
        - Prior to class tests, mid-term/final examination, the subject teacher announces such books, notes or other material that can be referred to by the students during the test or examinations. All other books, notes, papers, etc., are withdrawn from the examinees

    - Examination Schedule
        - The Chairman of the department publishes the mid-term and final examination schedule at least two weeks before start of the examinations in accordance with the university academic calendar

    - Conduct of Mid-Term and Final Examinations
        - The subject teacher shall be the Superintendent for the conduct of

examination. The chairman shall depute teachers or staff as Deputy Superintendent and Invigilators for the conduct of examinations. The Superintendent shall ensure the following:

- That all answer books used in the examination are signed or initialed. The teacher may require the students to answer on the question paper itself. No other answer books are to be used in these cases
- Answer books are issued to the invigilators 5 minutes before the commencement of the examination and retrieved at the end of the examination
- The absentee report, if any, is prepared and forwarded to the Chairman's office at the end of each examination

- Teachers or Staff acting as invigilators are detailed by the respective Chairman. They ensure the following:
  - That the students are identified through means such as university identification card
  - That the students are warned against the use of unfair means and have been advised to surrender mobile phones, notes, papers or other unauthorized material before the commencement of the examination
  - That the students are not allowed to talk with or copy from other students during the examination
  - That no student is allowed to join the examination 30 minutes after its commencement
  - That no student is allowed to submit the answer sheet and leave the examination room within 30 minutes of commencement of examination. Visits to toilets are carefully controlled
  - That the question papers and answer books of a student detected using unfair means or assisting another candidate, are taken away and the matter is reported to the respective chairman. The superintendent records all available evidence to be used as written proof later on
  - That the students write their registration numbers, name and class on the front cover of each additional answer sheet used. If more than one answer book is used, these are stapled together

- The subject teachers, being the Superintendent(s), shall supervise distribution of the question papers to the students according to the schedule published. In case of multiple Examination Centers, subject teachers (Superintendents) shall be available in or near the examination center during examination of their subject to clarify any query and to collect answer books after the examination

3. Degree Completion
   - Students, who are eligible for the award of degree, are required to submit a Degree Requirements Completion Form to their respective chairman for onward submission to the Controller of Examinations. Degree status would be decided only after receipt of this form

4. Disposal of Answer Scripts
   - Answer sheets of mid-term and final examinations will be stored in the respective department for two calendar years after declaration of result of that

semester. The sheets would be destroyed subsequently

5. Transfer of Credits of Subjects For Re-admitted Students
   - "Subjects" and "grades of subjects" in which they have earned a grade of "C" or above shall stand transferred and the students shall be placed in the semester recommended by the department

DISCIPLINE MATTERS AND CODE OF HONOR

1. Every Student Must Observe the Following Code of Honor:
   - He must be loyal, faithful in his religious duties and respect the conviction of others in matters of religion
   - He must be loyal to his country and refrain from doing anything which might lower its honor and prestige
   - He must be truthful and honest in dealings with all people
   - He must respect the elders and be polite to all especially women, children, old people, the weak and helpless
   - He must respect his teachers and others in authority in the University
   - He must keep clean in body and mind, standing for clean speech, sport and habits
   - He must help his fellow beings especially those in distress.
   - He must devote himself faithfully to his studies
   - He must observe thrift and protect property

2. Acts Of Indiscipline Punishable Under University Rules
   - No Student shall:
     - Smoke in the class room, laboratory, workshop, library, examination hall, convocation hall and during studio work or academic functions
     - Consume alcoholic liquor or other intoxicating drugs within the University Campus or a hall of residence or during the instructional, sports or cultural tours, or survey camps, or enter any such place or attend any such tour or camp, while under the influence of such intoxicants
     - Organize or take part in any function within the University campus or a hall of residence, organize any club or society of students except in accordance with the prescribed rules and regulations
     - Collect any 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 Vice Chancellor
     - Stage, incite or participate in any walkout, strike or other form of agitation against the University or its teachers and officers

3. A Student Who:
     - Commits a breach of any of the rules of conduct specified in these regulations or
     - Disobeys the lawful order of a teacher or other person in authority in the University or
     - Habitually neglects his work or habitually absents himself from his classes without reasonable cause or
     - Willfully damages University property or the property of a fellow student or any teacher or employee of the University or
     - Does not pay the fees, fines or other dues levied under the University ordinances rules and regulations or
     - Uses indecent language, wears immodest dress, makes indecent remarks or gestures or behaves in a disorderly manner or

- Commits any criminal, immoral, or dishonorable act whether within the University campus or otherwise which is prejudicial to the interest of the University

shall be guilty of an act of indiscipline and shall be liable for each such act to one or more of the penalties under the General Discipline Rules.

AUTHORITIES TO CHECK INDISCIPLINE

1. Every Member of the Teaching Staff Shall Have the powers and it shall be his duty to check disorderly or improper conduct or any breach of the rules by students occurring in any part of the precincts of the University. Should such misconduct occur in room when the student is under the charge of a demonstrator, the latter shall report the matter without delay to the Chairman of the Department
2. The Librarian shall Be responsible for maintenance of order in the Library. In case of disorderly conduct or any breach of rules, he may require the student so offending to withdraw from the library for the remainder of the day and shall immediately report the offence to the Chairman of the Library Committee
3. The Director of Physical Education shall Be responsible for the maintenance of order among the students on or near the play grounds or while otherwise under his charge
4. Committee of Discipline. There is a Committee of Discipline to deal with the serious cases of indiscipline. It consists of the following members as per University of Engineering and Technology, Punjab Act V of 1974:
    - Chairman to be nominated by the Vice-Chancellor
    - Two Professors to be nominated by the Academic Council
    - One member to be nominated by the Syndicate
    - Director Students Affairs (Member/Secretary)
    - Senior Tutor of the University and
    - Senior Warden of the University Hostels.

    The term of office of members of the Committee excluding ex-officio members shall be two years and the quorum for a meeting of the Committee of Discipline shall be four members

The functions of this Committee are:

- To propose Regulations to the Academic Council for the conduct of University Students, Maintenance of Discipline and breach of discipline and
- To perform such other functions as may be prescribed by Regulations

GENERAL DISCIPLINE RULES RELATING TO STUDENTS

1. When a case against a student is referred to the Committee of Discipline, the Committee may, if it deem fit, suspend the student from University Rolls and/or direct him to vacate the Hall of Residence till it has taken a decision in the case
2. The Vice-Chancellor shall have the power to impose any of the penalties mentioned in "Penalties for Acts of Indiscipline" or to refer any case to the Committee of Discipline
3. A Teacher or officer mentioned in "Penalties for Acts of Indiscipline" in whose presence or in relation to whom an act of indiscipline is committed or who obtains knowledge of such act on a report or otherwise, may deal with the case himself or if in his view:
    - The case is one which can be more appropriately dealt with by another authority or
    - A penalty or penalties severer than those which he is competent to impose are called for in the case; he shall follow the procedure specified below:
        - If he is not the Dean of the faculty he shall refer the case to the Dean who may deal with it himself or refer it to the appropriate authority
        - If he is the Dean of the Faculty, he shall refer it to the appropriate authority or the Committee of Discipline.
4. No Student shall be rusticated or expelled from the University, unless he has been allowed reasonable chance of replying to the accusation against him
5. When in the opinion of the Committee of Discipline, the penalty of rustication or expulsion is not called for in a case referred to it, it may impose any other penalties mentioned in "Penalties for Acts of Indiscipline"
6. When a Teacher or an Officer has imposed penalty/penalties on a student under "Penalties for Acts of Indiscipline", the later shall not be liable to a higher or an additional penalty unless the offending student has been given a reasonable opportunity of showing cause against the proposed action
7. An appeal against the imposition of penalty may be made within a week's time to the teacher who imposed the penalty. In case the student is not satisfied with his decision/revision he may appeal to the Chairman, Discipline Committee who shall place it before the Discipline Committee for its consideration and decision within a maximum of six weeks to dispose of the case. A final appeal against the imposition of penalty may then be made to the Committee as provided in Rule 11(i) of the General Discipline rules relating to students
8. An appeal against a decision imposing a penalty mentioned in clauses (r) and (s) of "Penalties for Acts of Indiscipline" shall lie with a Committee consisting of the Vice-Chancellor and the Deans of Faculties.
   No appeal shall lie against a decision of an authority imposing a penalty other than that mentioned in sub-rule (i) of this rule except on the ground that such authority has imposed a penalty, which it was not competent to impose
9. An appeal on the ground that an authority has imposed a penalty, which it was not competent to impose, shall lie to the Vice-Chancellor. No appeal by a student shall be entertained, unless it is presented within fifteen days from the date on which the decision is communicated to him provided that the Vice-Chancellor may for valid reason extent this period
10. The Vice-Chancellor or any teacher or officer to whom the Vice-Chancellor may

delegate his powers may direct a student to pay compensation for any loss of or damage to property belonging to the University or fellow student or to an employee of the University, caused by a willful act or gross negligence of the student and if the student does not pay such compensation within a reasonable time, the Vice-Chancellor may expel him from the University

11. The Syndicate may for special reason re-admit a student rusticated or expelled from the university under these rules, if otherwise eligible.

FINANCIAL MATTERS AND FEE REGULATIONS

1. Periods of fees and Other Charges
   - The tuition fee of the program is Rupees 126,000 per student payable in three installments of Rupees 42,000 each at the beginning of every semester. Registration fee is Rupees 9,000 payable once at the time of admission and is non-refundable

2. Registration in a Semester
   - The department would register students at the beginning of each semester after proof of payment of all applicable recurring fees and charges for six months. Students who do not submit their dues during the prescribed period shall have their names struck off the rolls of the university and they shall have to pay the registration fee along with the fees and fine before readmission. Registration of students as sit-in students shall be made on submission of proof of payment of dues on per subject basis

3. Semester Freezing and Relegation Charges
   - Students freezing their studies for one semester shall continue to pay all recurring fees and charges as applicable to regular students. Whereas students freezing their studies for two consecutive semesters shall pay a lump sum Admission Retaining fee only. However, upon joining the next junior class they shall continue to pay recurring fees as regular students along with the next junior session. Relegated students shall continue to pay recurring fees and dues along with regular students. On successful completion they would have paid recurring dues for one additional year

DISCLAIMER

The contents of this prospectus are for information and shall not be TAKEN AS BINDING on the University. Each aspect of the education set up, like the admission procedure or criteria, the examination regulations, discipline, etc. requires continuing review by the competent authorities. The University therefore reserves the right to change rules and regulations applicable to students whenever it is deemed appropriate or necessary. Inquiries concerning admission should be addressed to:

Convener Admission Committee
UNIVERSITY OF ENGINEERING AND TECHNOLOGY
LAHORE - 54890, PAKISTAN
TELEPHONE: +92 42 99029216 and +92 42 99029452
E-mail: admission@uet.edu.pk