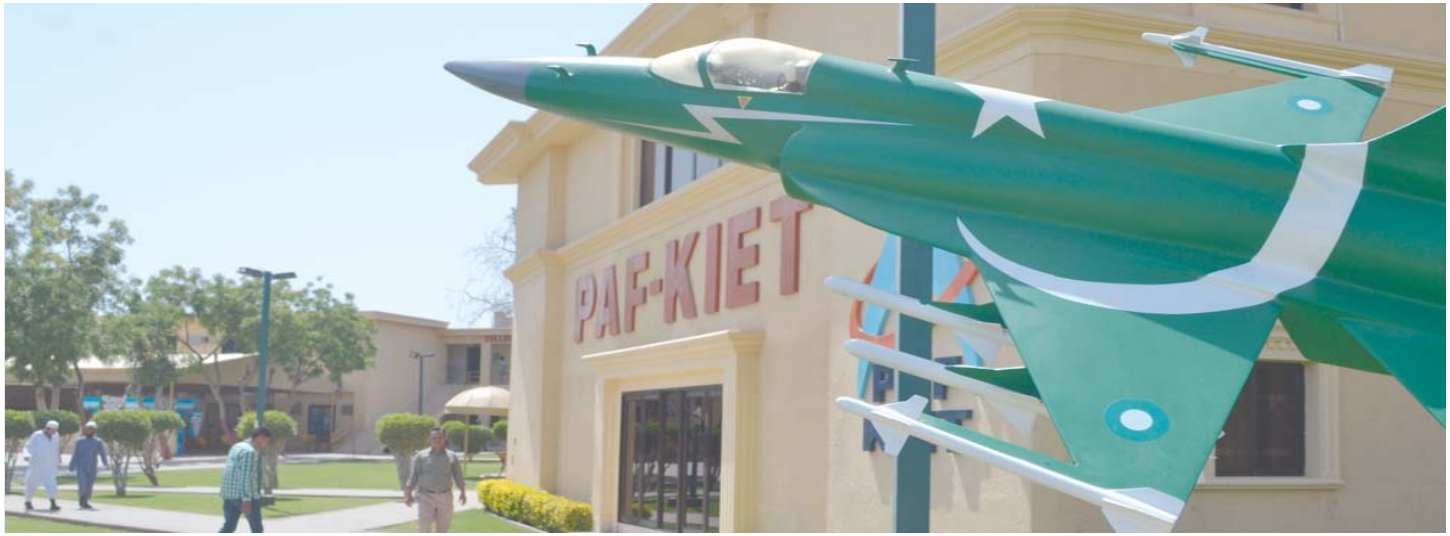

ENGINEERING



Introduction

PAF-KIET College of Engineering aims to promote well-endowed engineering education, outstanding research programs and pretension less service to our students. The college offers four years Bachelor of Engineering program which includes degrees in Electrical, Avionics and Mechatronics Engineering approved by Pakistan Engineering Council.

The engineering degree program has been developed after extensive deliberations in the Engineering Curriculum Advisory Board comprising industry leaders, distinguished academicians, eminent professionals, senior executives and technology entrepreneurs belonging to companies dealing in Electronics, Mechatronics, Telecommunication, Computer hardware and software, and Aviation products and services.

BE Electrical with three Major streams
Electronics:
The growing range of electronics employed in every field and the trend towards miniaturization, mobility, networking, robotics and remote control has created a tremendous demand for professional electronic engineers as a designer, developers and engineering managers. The structure and curriculum of this program is comparable to any international engineering degree program.

Computer Systems Engineering:
This program is an integration of several fields of electrical engineering and computer science. The graduates of this program can concurrently design hardware, software, firmware, and manage all forms of computer systems used in the industry. This program provides the knowledge and skills to plan, develop, test and supervise hardware and software systems, which relate to communication and networks, signals processing, software engineering, intelligent controls and embedded systems.

Telecommunication:

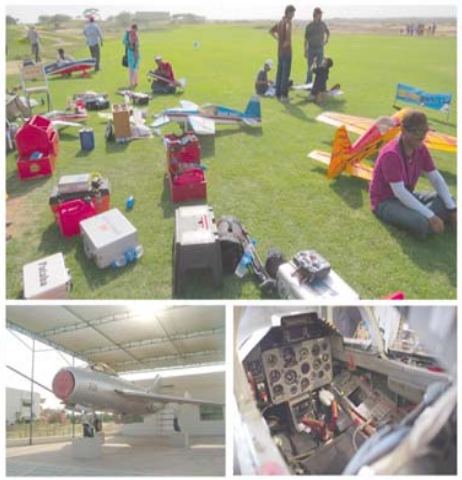
The field of telecommunication has emerged with dominant response in the last few years. The field has penetrated very rapidly since its inception and has achieved level of integrity of various technologies. There has been a spurt in telecommunication investment from local and foreign sources and this has created a surge in demand for telecom experts to develop, manage and maintain telecommunication networks and systems. With more and more companies entering into this industry high demand for telecommunication specialists now exits in the job market.

Why choose BE Electrical at College of Engineering?

- BE Electrical program with majors in Electronics, Computer Systems and Telecommunication is approved by Pakistan Engineering Council(PEC)
- Highly qualified and research oriented PEC registered faculty
- Projects mentorship and guidance
- Seminars and workshops for introducing students to latest trends in technology and industrial trends
- Counseling and career guidance for the graduating students

BE Avionics

The BE Avionics curriculum is designed from a futuristic perspective to accommodate existing as well as emerging trends for electronic systems used on aircrafts, satellites and spacecrafts. The BE Avionics program principally focuses on aviation electronics along with a strong emphasis on related mechanics leading to a curriculum that effectively combines aero-dynamics, mechanics and electronics. The curriculum intentionally attempts to align the electronics curriculum with the modern micro/nano-electronics regimes taking advantage of high degree of miniaturization to enable entirely new application domains. This program features courses in Electronic Flight Instrumentation Systems, Radars Systems, Guidance and



Navigation, Integrated Avionics, Emerging Aviation Technologies, Avionics Systems Design, Engineering Mechanics, Aerodynamics and Flight Control Systems, which are required for a wide range of careers in the Aviation and related industries.

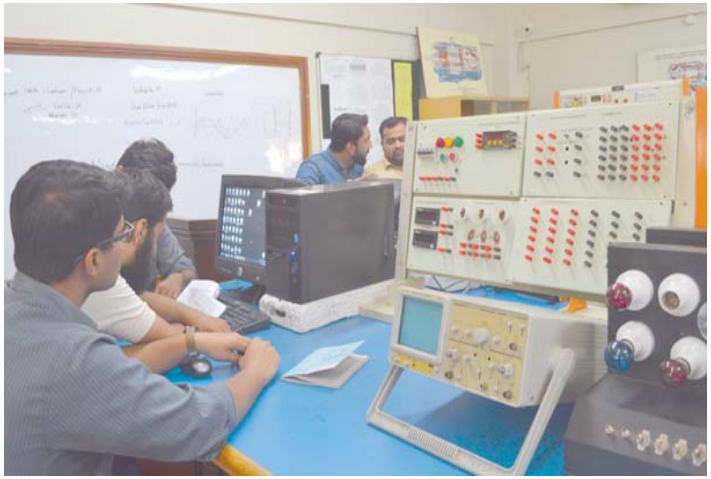
Why choose BE Avionics at College of Engineering?

- BE Avionics is PEC permitted program
- Highly qualified and research oriented PEC registered faculty
- Projects mentorship and guidance to be participated at National and International level
- Seminars and workshops for introducing students to latest trends in avionics technology and industrial trends
- Counseling and career guidance for the graduating students

BE Mechatronics:

BE Mechatronics is a unique multidisciplinary degree that combines interdependencies of mechanical engineering with electrical engineering. Formally defines as the synergistic combination of precision mechanical, electronic, control and system engineering in the design of products and manufacturing processes. From fuzzy logic controlled washing machines to space exploration, mechatronics responds to industry's increasing demand for engineers who are able to work across the boundaries of narrow engineering disciplines to identify and use proper combination of technologies for optimum solutions to today's challenging engineering problems. Manufacturing, automotive engineering, aerospace, robotics, automated controls and medical science are just a few areas that are benefiting from the developments in mechatronics. The availability of mechatronics engineers is bound to bring a big change in what goes around us today.

Industries now look for graduates who have a broader engineering background, specifically mechanical with a combination of controls and computers. Graduates of this specialization are expected to secure positions as plant engineers, development engineers and project engineers. The strongest area wherein they can be gainfully employed is as entrepreneurs changing the face of the existing industry.



Why choose BE Mechatronics at College of Engineering?

- BE Mechatronics is PEC permitted program
- Teaching by distinguished faculty that includes IEEE and PEC members
- A project-based and rigorously monitored engineering program
- BE Mechatronics program best suited to Automobile Robotic and Electro Mechanical industry requirements
- Good job opportunities upon graduation- students near graduation undergo career development seminar and workshop that provide excellent career preparation

Program Objectives

The objectives of our undergraduate engineering degree program center upon providing an environment wherein students are encouraged and stimulated to learn in multiple dimension. These dimensions include:

- A firm grasp of the basic engineering concepts, a solid grounding in practical skills and the ability to apply this knowledge to solve real problems.
- Understanding of the relationships between the discipline specific engineering technologies and technologies associated with other engineering disciplines.
- Initiative, resourcefulness and excellence in applying engineering knowledge to the design of engineering systems.
- In-depth knowledge of major field chosen by the student as areas of special interest.
- Initiative, resourcefulness and excellence in applying engineering knowledge to the design of engineering systems.
- Strong communication and interpersonal skills.
- A professionalism recognized in the chosen fields for leadership, integrity and sensitivity to societal issues.

Unique Features of BE Program

College of Engineering carries a title of distinctive degree program. The dominant features of the program are as follow:

- Project-intensive: challenging and exciting projects in every taught course.
- Online monitoring and evaluation of student performance in all aspect including attendance, grading and courses information.
- Well equipped laboratories to perform experiments and validates results what teaches in theory.
- Industry orientation by firm coupling of BE program with industry needs, enables instant placement of out graduates in the industry.

PEC Accreditation

The engineering program has been designed to fulfill Pakistan Engineering Council (PEC) requirements. Our commitment to excellence is reflected from highly qualified and dedicated faculty, dedicated and fully equipped laboratories, fully Air conditioned and well-designed building, spacious lecture halls, multimedia enabled classroom environment, ample library resources and strong service to our students. B.E (Electronical) is a PEC accredited program.

Research at COE

The engineering programs at COE open the door of world class research for both faculty and students. There is wide spectrum of research being carried out by faculty members and seniors students in COE. The research domain mainly focuses on the following. The current research at the COE mainly includes the following areas

- Electronic Circuit Design / Integrated Circuit (IC) Design
- Control Systems
- Smart Robots
- Signal/Image processing
- 5G mobile communication
- Signal Processing
- Embedded Systems
- Microsystem (MEMS/NEMS) Design

The faculty and students have published several research papers in reputed National and International journals and conferences.

The current research by the faculty as well as Engineering students is focused on stimulating Research areas that include: Unmanned Ground Vehicles (UGV), Navigational Robots, Industrial Automation, Unmanned Aerial Vehicles (UAV), Image Recognition, Computer Architecture and Embedded Systems, 5G mobile communication and Smart Antennas

Departmental library

Besides main library, College of Engineering has its own departmental library to meet the exclusive needs of the college of engineering faculty and students. The Departmental Library has collection of library material to cater for the design and development requirements of electronics, communications, instrumentation & measurement and digital systems.

The departmental library has a variety of research journals, conference proceedings, handbooks, design manuals, data sheets, design guides, design specification books and project reports required specially in the Senior Design Project work. The Departmental library is connected to IEEE digital library, ACM digital library and national digital library.

General Engineering Workshop

An exclusive general engineering workshop equipped with requisite machines, tools and other components. The General Engineering Workshop caters for machining, electrical and metalwork, carpentry and printed circuit board (PCB) fabrication requirements of our students for their project work.

Component Center

Our engineering program has a special emphasis on project work. By design all engineering courses are project-based. This mandatory requirement demands spot purchase of electronics and other components frequently needed in the completion of course projects. For this purpose, a component center has been established to take care of students needs inside the campus premises.

Industrial visits

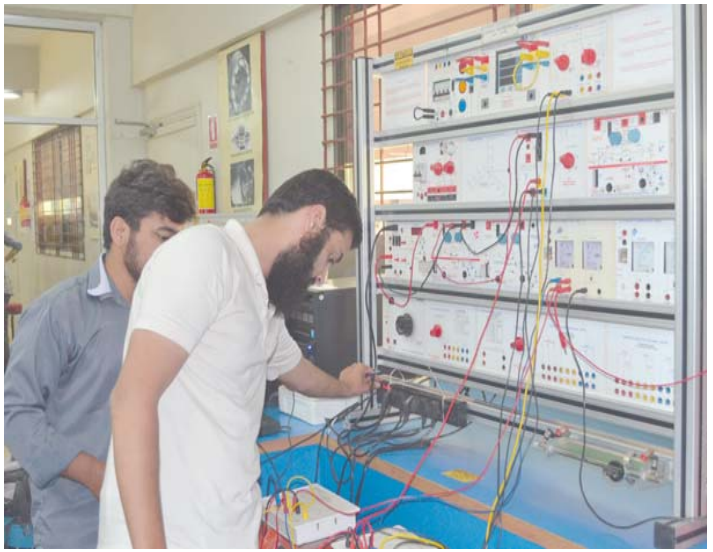
Exposure and interaction with industrial organizations of the country play an important role in the professional grooming of engineering students. With this purpose our engineering students visit different industries and engineering enterprises during their 4-year program. During industrial trips, students visit operations, production and assembly lines, material management, process controls, R&D centers, quality control and other support facilities to acquaint themselves with the working of industry.

Project Competitions and Exhibitions

The College of Engineering encourages innovative work and promotes pursuit for excellence. For this purpose, we provide stimulating environment to our students to exhibit their engineering talent and compete in a challenging environment. We also promptly acknowledge our student's work by attractive awards. At College of Engineering students display their projects during Course project exhibition held every semester and win the best projects awards. During this exhibition we invite professionals from industry, academia and the parents to see for themselves the achievements of our students.

Student Engineering Exhibition (SEE)

The College of engineering also holds student's Engineering Exhibition (SEE) every year. SEE is national level event intended to give students a stepping –stone for entering into the engineering Industry. Electronic and print media extends a wide coverage to this event. It is a platform that allows industry professionals participation and student interaction as well as offering the corporate sector a chance to assess the potential of engineering students. It is an event that showcases the efforts and expertise in creating innovating solutions for real – world problems by engineering students from all over Pakistan. The best three projects chosen by a panel of neutral judges receive handsome prize money.



National Flying Competition (NFC)

College of Engineering holds National Flying Competition (NFC) every year. NFS is a two-day national level event, where students design, manufacture and fly various categories of aircraft including fixed wing aircraft, ornithopters, powered RC planes and gliders. NFC allows professionals, students and hobbyists to interact at one platform. This event attracts students and hobbyists all over Pakistan and one can see excellent models and remarkable flying. The best three flying models, chosen by a panel of neutral Judges, receive handsome prize money.

ROBO QUEST

"Robo Cops" a society that spreads robotics knowledge and robo – modeling among the KITIANs, was established in Fall 2011 by group of Students. ROBO QUEST is the event of "Robo Cops" held every semester on the day of SPEE (Semester Project Engineering Exhibition) in which the students participate for the line-following robots competition. The participants mostly from 1st and 2nd semester get complete guidance regarding line following robots by "ROBO COPS" team. The winners are given lucrative awards.

Semester Project Exhibition & Competition (SPEC)

College of Engineering has a special emphasis on the projects which are assigned in each course. Every course taught has a compulsory project component to make learning both exciting and rewarding. These hand–on experiences transform students into professional engineers. Before the final exams of each semester, course projects are displayed in an exhibition specially organized for this purpose. Industry professionals and external faculty along with internal faculty evaluate the projects. In addition to display, students also exhibit a poster and make presentations about their projects.

ROBOSPRINT

The name 'ROBOSPRINT' is attributed to an annual robotics competition held by Center for Advanced Studies in Engineering (CASE) to promote passion for the field of robotics in its undergraduate students. ROBOSPRINT was initiated at a local level by CASE Robotics Group (CRG) - the undergraduate robotics research group of CASE, in 2009. PAF-KIET organized ROBOSPRINT in November 8-10 2015 in which different universities across Pakistan participated in senior category, where as some schools of Karachi participated in junior category. The Engineering Exhibition was also the part of ROBOSPRINT in which students displayed their senior design projects which were evaluated by industrial and academic experts.

Job Opportunities

The design of our BE programs fulfill the needs of a wide spectrum of public / private sector organizations involved in operations and maintenance, design manufacturing, quality control and high technology R&D and the services sector.

Our BE programs meet the demands of manufacturing sector and enable young engineering graduates for instant placement in manufacturing industries such as, consumer and power electronics, fertilizers, telecommunication, automobile, energy, textiles, chemicals and medical instruments.

Graduates of BE Electrical, Avionics and Mechatronics programs are equipped with necessary foundation and skills required by various companies dealing with maintenance of various electronics and telecom products, such as home electronic appliances, medical equipment, stabilizers, UPS, PABX, generators, industrial control equipment, card phones, PoS , ATMs and other e-banking systems, networking equipment fiber optics communication components, radio modems, satellite communication ancillaries, radars, aircrafts, automobiles and automation.

The BE program also enable engineering graduates for job opportunities in services sector organizations such as aviation, automobiles, electrical infrastrucre, telecom companies, mobile communication and cable companies, ISPs, Call Centers, security and tracking system companies. Job opportunities exist in the fields of sales, marketing, and consultancy as well for engineers having strong communication and interpersonal skills.

Recent Research Publications

Name of Author	Title of Paper	Name of Journal with Details of Publications
M.M. Iqbal, H. Parvez, M. Rashid	Multi-Circuit": Automatic Generation of an Application Specific Configurable Core for known set of Application Circuits	Journal of Circuits, Systems and Computers Vol. 25, No. 9 (2016).
G Monir	Two dimensional spatiochroamtic signal processing using concept of phasors in sequency domain	Electronics Letters (2016)
I Naseem, A Aleem, R Togneri, M Bennamoun	Iris recognition using class-specific dictionaries	Computers & Electrical Engineering (2016)
S.Javed, K.Ishaque, Zeeshan Ali	A simplified yet effective Fuzzy Logic controller for chemical ship tanker	Journal of Intelligent and Fuzzy systems. (2015)
D Jabeen, G Monir, F Azim	Sequency Domain Signal Processing Using Complex Hadamard Transform	Circuits, Systems, and Signal Processing, 1-11 (2015)
I Naseem, R Togneri, M Bennamoun	A Novel Information Theoretic Approach to Gene Selection for Cancer Classification Using Microarray Data	Current Bioinformatics 10 (4), 431-440 (2015)
VJ Chin, Z Salam, K Ishaque	Cell modelling and model parameters estimation techniques for photovoltaic simulator application: A review	Applied Energy 154, 500-519 (2015)
MAM Ramli, K Ishaque, F Jawaid, YA Al-Turki, Z Salam	A modified differential evolution based maximum power point tracker for photovoltaic system under partial shading condition	Energy and Buildings 103, 175-184 (2015)
VJ Chin, Z Salam, K Ishaque	An accurate two diode model computation for CIS thin film PV module using the hybrid approach	Electric Power and Energy Conversion Systems (EPECS), 2015
VJ Chin, Z Salam, K Ishaque	An improved method to estimate the parameters of the single diode model of photovoltaic module using differential evolution	Electric Power and Energy Conversion Systems (EPECS), 2015
SH Khan, M Bennamoun, F Sohel, R Togneri, I Naseem	Integrating Geometrical Context for Semantic Labeling of Indoor Scenes using RGBD Images	International Journal of Computer Vision, 1-20 (2015)
MMA Baig, SA Qazi, MB Kadri	Discriminative Training for Phonetic Recognition of the Holy Quran	Arabian Journal for Science and Engineering 40 (9), 2629-2640 (2015)
MB Kadri, S Nisar, SZ Khan, WA Khan	Comparison of ANN and finite element model for the prediction of thermal stresses in diode laser cutting of float glass	Optik-International Journal for Light and Electron Optics 126 (19), 1959-1964 (2015)
A Asghar, H Parvez	An Improved Diffusion Based Placement Algorithm for Reducing Interconnect Demand in Congested Regions of FPGAs	International Journal of Reconfigurable Computing 2015

Degree Structure:
BE Electrical
(Major in Electronics & Telecom)
Engineering Courses

Duration : 4 Years (8 Regular Semesters)
Program Credits Hrs : 142
Engineering : 95 Cr Hrs
Non-Engineering : 41 Cr Hrs
Other Degree Requirement : 6 Cr Hrs
Eligibility : HSC (Pre-Engineering) with minimum 60% marks or A- levels (Physics, Chemistry and Mathematics) or DAE (in relevant field) with minimum 70% marks

Knowledge Area	Courses	Theory Contact Hrs	Practical Contact Hrs	Credits Hrs	Total Courses	Total Credit Hrs
Computing	Introduction to Computer Programming	2	3	3	2	6
	Algorithms and Data Structures	2	3	3		
Foundation	Workshop Technology	0	3	1	12	38
	Engineering Drawing	1	3	2		
	Linear Circuit Analysis	3	3	4		
	Electrical Network Analysis	3	0	3		
	Fundamentals of Electronics	3	3	4		
	Electronic Circuit Design	3	3	4		
	Electrical Machines	3	3	4		
	Digital Logic Fundamentals	3	3	4		
	Signals and Systems	3	0	3		
	Electromagnetic Fields Theory	3	0	3		
	Computer Architecture and Organization	3	0	3		
	Probability Methods in Engineering	3	0	3		
Breadth	Communication Systems	3	3	4	6	22
	Microprocessor-based Systems	3	3	4		
	Linear Integrated Circuits and Applications	3	3	4		
	Instrumentation and Measurement	2	3	3		
	Linear Control Systems	3	3	4		
	Microwave and Antennas	2	3	3		
Interdisciplinary	Engineering Mechanics	3	0	3	2	6
	Engineering Thermodynamics	3	0	3		
Depth	Elective I	3	3	4	5	18
	Elective II	3	3	4		
	Elective III	3	3	4		
	Elective IV	3	0	3		
	Elective V	3	0	3		
Project	Senior Design Project I	0	9	3	2	6
	Senior Design Project II	0	9	3		
Total Engineering Courses		**72**	**72**	**96**	**29**	**96**

Degree Structure:

BE Electrical

(Major in Computer Systems)

Engineering Courses

Knowledge Area	Courses	Theory Contact Hrs	Practical Contact Hrs	Credits Hrs	Total Courses	Total Credit Hrs
Computing	Introduction to Computing	1	3	2	3	9
	Object Oriented Programming	2	3	3		
	Algorithms and Data Structures	3	3	4		
Foundation	Workshop Technology	0	3	1	10	32
	Engineering Drawing	1	3	2		
	Linear Circuit Analysis	3	3	4		
	Signals and Systems	3	0	3		
	Electrical Network Analysis	3	0	3		
	Fundamentals of Electronics	3	3	4		
	Electronic Circuit Design	3	3	4		
	Digital Logic Fundamentals	3	3	4		
	Microprocessor based Systems	3	3	4		
	Probability Methods in Engineering	3	0	3		
Breadth	Computer Architecture and Organization	3	3	4	6	23
	Operating System	3	0	3		
	Communication Systems	3	3	4		
	Database Management Systems	3	3	4		
	Software Engineering	3	3	4		
	Computer Communication Network	3	3	4		
Interdisciplinary	Engineering Mechanics	3	0	3	2	6
	Fundamentals of Thermal Sciences	3	0	3		
Depth	Elective I	3	3	4	5	19
	Elective II	3	3	4		
	Elective III	3	3	4		
	Elective IV	3	1	4		
	Elective V	3	0	3		
Project	Senior Design Project I	0	9	3	2	6
	Senior Design Project II	0	9	3		
Total Engineering Courses		**70**	**73**	**93**	**28**	**95**

BE Electrical

Non-Engineering Courses

Knowledge Area	Subject Area	Courses	Theory Contact Hrs	Practical Contact Hrs	Credits Hrs	Total Courses	Total Credit Hrs
Humanities	English	English I (Proficiency Development)	3	0	3	3	9
		English II (Public Speaking)	3	0	3		
		English III (Official Communication and Report Writing)	3	0	3		
	Culture	Islam and Pakistan Studies	3	0	3	1	3
	Social Sciences	Professional and Social Ethics	2	0	2	3	4
		Leadership and Motivation	1	0	1		
		Community Service	0	3	1		
Management Sciences		Engineering Project Management	3	0	3	2	6
		Technology Entrepreneurship	3	0	3		
Natural Sciences	Math	Calculus	3	0	3	5	15
		Linear Algebra	3	0	3		
		Differential Equations and Transforms	3	0	3		
		Complex Variables and Multivariable Calculus	3	0	3		
		Numerical Methods	3	0	3		
	Physics	Engineering Physics	3	3	4	1	4
Sub Total Non-Engineering Courses			39	6	41	15	41
Industrial Training (Summer Internships)		Internship I & II		2			2
Physical Training & Education (Sports)		Sports (Indoor/Outdoor)		4			4
Sub Total Other Degree Requirements				6			6
Total Program						43	142

Depth Courses (Electronics Major)

Course Title	CR-H
Power Electronics	3 + 1
Industrial Control and Automation	2 + 1
/ Integrated Digital Electronics	3 + 0
Embedded Systems Design	2 + 1
/ Digital Image Processing	3 + 0
FPGA-based System Design / Robotics	3 + 1
Digital Signal Processing	3 + 1

Depth Courses (Computer Systems Major)

Course Title	CR-H
Linear Control Sys. / Computer Graphics	3 + 1
/ Adv. Comp. Arch. / Parallel Processing	
Digital Signal Processing	3 + 1
Artificial Intelligent / Intro. to Robotics	3 + 1
/ FPGA-based Systems Design	
Emerging Technologies	3 + 1
Digital Image Processing / Embedded Sys.	3 + 0
/ Wireless and Mobile Communication	

Depth Courses (Telecom Major)

Course Title	CR-H
Wireless and Mobile Communication	3 + 0
Digital Communication	3 + 0
Computer Communication Networks	3 + 1
Transmission and Switching Systems	3 + 1
Digital Signal Processing	3 + 1

Scheme of Studies:
BE Electrical (Major in Electronics)

YEAR -1

		CR-H
Semester I		
EE1401	Linear Circuit Analysis	3 + 1
MS1303	Calculus	3 + 0
MS1401	Engineering Physics	3 + 1
ME1102	Workshop Technology	0 + 1
EE1407	Digital Logic Fundamentals	3 + 1
Semester II		
CS1301	Introduction to Computer Programming	2 + 1
HS1102	Community Service	0 + 1
MS1302	Linear Algebra	3 + 0
EE2403	Fundamentals of Electronics	3 + 1
HS1303	English I (Proficiency Development)	3 + 0
ME1303	Engineering Mechanics	3 + 0
HS1101	Leadership and Motivation	1 + 0

YEAR -2

		CR-H
Semester III		
MS1304	Differential Equations and Transforms	3 + 0
EE2302	Electrical Network Analysis	3 + 0
CS2302	Algorithms and Data Structures	2 + 1
EE2404	Electronic Circuit Design	3 + 1
HS2304	English II (Public Speaking)	3 + 0
ME2201	Engineering Drawing	1 + 1
Semester IV		
MS2305	Complex Variables and Multivariable Calculus	3 + 0
EE2309	Signals and Systems	3 + 0
EE3405	Linear ICs and Applications	3 + 1
EE2425	Electrical Machines	3 + 1
EE2308	Computer Architecture and Organization	3 + 0

YEAR -3

		CR-H
Semester V		
EE3411	Linear Control Systems	3 + 1
EE3417	Microprocessor based Systems	3 + 1
EE2319	Electromagnetic Field Theory	3 + 0
EE3306	Instrumentation and Measurement	2 + 1
ME3306	Fundamentals of Thermal Sciences	3 + 0
Semester VI		
EE3410	Communication Systems	3 + 1
EE4427	Elective-1, Power Electronics	3 + 1
EE3320	Microwave and Antennas	2 + 1
MG3301	Project Management	3 + 0
MS3306	Probability Methods in Engineering	3 + 0
EE3416	Elective-2, Digital Signal Processing	3 + 1

YEAR -4

		CR-H
Semester VII		
HS4206	Professional and Social Ethics	2 + 0
MS4307	Numerical Methods	3 + 0
EE43xx	Elective-3, Industrial Control and Automation / Integrated Digital Electronics	2 + 1 3 + 0
EE43xx	Elective-4, Embedded System Design / Digital Image Processing	3 + 0
DP4301	SDP-I	0 + 3
Semester VIII		
EE44xx	Elective-5, FPGA-Based System Design / Computer Communication Networks / Robotics	3 + 1
MG4302	Technology Entrepreneurship	3 + 0
DP4302	SDP II	0 + 3
HS3305	English III (Official Communication and Report Writing)	3 + 0
HS4306	Pakistan and Islamic Studies	3 + 0

Scheme of Studies:
BE Electrical (Major in Computer Systems)

YEAR -1

		CR-H
Semester I		
CS1201	Introduction to Computing	1 + 1
EE1401	Linear Circuit Analysis	3 + 1
HS1101	Leadership and Motivation	1 + 0
MS1303	Calculus	3 + 0
HS1102	Community Service	0 + 1
EE1407	Digital Logic Fundamentals	3 + 1
Semester II		
EE2403	Fundamentals of Electronics	3 + 1
CS1302	Object Oriented Programming	2 + 1
HS1303	English I (Proficiency Development)	3 + 0
MS1302	Linear Algebra	3 + 0
MS1401	Engineering Physics	3 + 1
ME1102	Workshop Technology	0 + 1

YEAR -2

		CR-H
Semester III		
EE2302	Electrical Network Analysis	3 + 0
CS2302	Algorithms and Data Structures	3 + 1
ME2201	Engineering Drawing	1 + 1
HS2304	English II (Public Speaking)	3 + 0
MS1304	Differential Equations and Transforms	3 + 0
ME1303	Engineering Mechanics	3 + 0
Semester IV		
CS2403	Database Management System	3 + 1
EE2408	Computer Architecture and Organization	3 + 1
EE2404	Electronic Circuit Design	3 + 1
MS2305	Complex Variables and Multivariable Calculus	3 + 0
CS3301	Operating Systems	3 + 0

YEAR -3

		CR-H
Semester V		
EExxxx	Elective-1, Linear Control Systems / Computer Graphics / Advanced Computer Architecture / Parallel Processing	3 + 1
MS3306	Probability Methods in Engineering	3 + 0
EE3417	Microprocessor based Systems	3 + 1
EE2309	Signals and Systems	3 + 0
ME3306	Fundamentals of Thermal Sciences	3 + 0
Semester VI		
CS3411	Software Engineering	3 + 1
EE3410	Communication Systems	3 + 1
EE3416	Elective-2, Digital Signal Processing	3 + 1
MS4307	Numerical Methods	3 + 0
MG3301	Project Management	3 + 0

YEAR -4

		CR-H
Semester VII		
EExxxx	Elective-3, Artificial Intelligence, FPGA-based Systems Design, Introduction to Robotics	3 + 1
DP4301	SDP-I	0 + 3
HS4206	Professional and Social Ethics	2 + 0
EE4414	Computer Communication Networks	3 + 1
EExxxx	Elective-4, Emerging Technologies	3 + 1
Semester VIII		
EExxxx	Elective-5, Digitial Image Processing, Embedded Systems, Wireless and Mobile Communication	3 + 0
DP4302	SDP II	0 + 3
HS3305	English III (Official Communication and Report Writing)	3 + 0
HS4306	Pakistan and Islamic Studies	3 + 0
MG4302	Technology Entrepreneurship	3 + 0

Scheme of Studies:
BE Electrical (Major in Telecom)

YEAR -1

		CR-H
Semester I		
EE1401	Linear Circuit Analysis	3 + 1
MS1303	Calculus	3 + 0
MS1401	Engineering Physics	3 + 1
ME1102	Workshop Technology	0 + 1
EE1407	Digital Logic Fundamentals	3 + 1
Semester II		
CS1301	Introduction to Computer Programming	2 + 1
HS1102	Community Service	0 + 1
MS1302	Linear Algebra	3 + 0
EE2403	Fundamentals of Electronics	3 + 1
HS1303	English I (Proficiency Development)	3 + 0
ME1303	Engineering Mechanics	3 + 0
HS1101	Leadership and Motivation	1 + 0

YEAR -2

		CR-H
Semester III		
MS1304	Differential Equations and Transforms	3 + 0
EE2302	Electrical Network Analysis	3 + 0
CS2302	Algorithms and Data Structures	2 + 1
EE2404	Electronic Circuit Design	3 + 1
HS2304	English II (Public Speaking)	3 + 0
ME2201	Engineering Drawing	1 + 1
Semester IV		
MS2305	Complex Variables and Multivariable Calculus	3 + 0
EE2309	Signals and Systems	3 + 0
EE3405	Linear ICs and Applications	3 + 1
EE2425	Electrical Machines	3 + 1
EE2308	Computer Architecture and Organization	3 + 0

YEAR -3

		CR-H
Semester V		
EE3411	Linear Control Systems	3 + 1
EE3417	Microprocessor based Systems	3 + 1
EE2319	Electromagnetic Field Theory	3 + 0
EE3306	Instrumentation and Measurement	2 + 1
ME3306	Fundamentals of Thermal Sciences	3 + 0
Semester VI		
EE3410	Communication Systems	3 + 1
EE3416	Elective-1, Digital Signal Processing	3 + 1
EE3320	Microwave and Antennas	2 + 1
MG3301	Project Management	3 + 0
MS3306	Probability Methods in Engineering	3 + 0

YEAR -4

		CR-H
Semester VII		
EE4313	Elective-2, Wireless and Mobile Communication	3 + 0
EE4312	Elective-3, Digital Communication	3 + 0
EE4414	Elective-4, Computer Communication Networks	3 + 1
HS4206	Professional and Social Ethics	2 + 0
MS4307	Numerical Methods	3 + 0
DP4301	SDP-I	0 + 3
Semester VIII		
EE4415	Elective-5, Transmission and Switching Systems	3 + 1
MG4302	Technology Entrepreneurship	3 + 0
DP4302	SDP II	0 + 3
HS3305	English III (Official Communication and Report Writing)	3 + 0
HS4306	Pakistan and Islamic Studies	3 + 0

Degree Structure:

Duration : 4 Years (8 Regular Semesters)
Program Credits Hrs : 144
Engineering : 100 Cr Hrs
Non-Engineering : 38 Cr Hrs
Other Degree Requirement : 6 Cr Hrs
Eligibility : HSC (Pre-Engineering) with minimum 60% marks or A- levels (Physics, Chemistry and Mathematics) or DAE (in relevant field) with minimum 70% marks

BE Avionics
Engineering Courses

Knowledge Area	Courses	Theory Contact Hrs	Practical Contact Hrs	Credits Hrs	Total Courses	Total Credit Hrs
Computing	Introduction to Computer Programming	2	3	3	2	6
	Numerical Methods	3	0	3		
Foundation	Engineering Drawing	1	3	2	12	37
	Engineering Statics	2	0	2		
	Engineering Dynamics	2	0	2		
	Linear Circuit Analysis	3	3	4		
	Electrical Network Analysis	3	0	3		
	Electrical Machines	3	3	4		
	Digital Logic Fundamentals	3	3	4		
	Fundamentals of Electronics	3	3	4		
	Electronic Circuit Design	3	3	4		
	Electromagnetic Field Theory	3	0	3		
	Signals and Systems	3	0	3		
	Probability Methods in Engineering	3	0	3		
Breadth	Linear Control Systems	3	3	4	5	19
	Linear Integrated Circuits and Applications	3	3	4		
	Microcontroller based systems	3	3	4		
	Instrumentation and Measurement	2	3	3		
	Communication Systems	3	3	4		
Interdisciplinary	Engineering Thermodynamics	3	0	3	4	10
	Applied Aerodynamics	2	0	2		
	Computer Communication Networks	3	3	4		
	Workshop Technology	0	3	1		
Depth	Radar Systems Engineering	3	3	4	7	22
	Flight Control Systems	3	3	4		
	Navigation Guidance and Control	3	0	3		
	Avionic Systems Design	3	0	3		
	Digital Signal Processing	3	3	4		
	Microwave and Antennas	2	3	3		
	Emerging Aviation Technologies	1	0	1		
Senior Design Project	Senior Design Project – I	0	9	3	2	6
	Senior Design Project - II	0	9	3		
	Industrial Training (Summer)	0	0	0	0	0
Total Engineering Courses		77	72	101	32	100

BE Avionics

Non-Engineering Courses

Knowledge Area	Subject Area	Courses	Theory Contact Hrs	Practical Contact Hrs	Credits Hrs	Total Courses	Total Credit Hrs
Humanities	English	English I (Proficiency Development) English II (Public Speaking) English III (Official Comm. and Report Writing)	3 3 3	0 0 0	3 3 3	3	9
	Culture	Islam and Pakistan Studies	3	0	3	1	3
	Social Sciences	Professional and Social Ethics Leadership and Motivation Community Service	2 1 0	0 0 3	2 1 1	3	4
Management Sciences		Engineering Project Management Technology Entrepreneurship	3 3	0 0	3 3	2	6
Natural Sciences	Math	Calculus Linear Algebra Differential Equations and Transforms Complex Variables and Multivariable Calculus Numerical Methods	3 3 3 3 3	0 0 0 0 0	3 3 3 3 3	5	15
	Physics	Engineering Physics	3	3	4	1	4
Sub Total Non-Engineering Courses			39	6	41	14	38
Industrial Training (Summer Internships)		Internship I & II		2			2
Physical Training & Education (Sports)		Sports (Indoor/Outdoor)		4			4
Sub Total Other Degree Requirements				6			6
Total Program						45	144

Location: PAF-KIET Main Campus

Comprehensive exam is a mandatory requirement. Student must clear this exam to become eligible for the degree. The curriculum structure, duration and scheduling of each degree program are subject to change without notice.

Scheme of Studies:
BE Avionics

YEAR -1

		CR-H
Semester I		
EE1401	Linear Circuit Analysis	3 + 1
MS1303	Calculus	3 + 0
MS1401	Engineering Physics	3 + 1
CS1301	Introduction to Computer Programming	2 + 1
ME1102	Workshop Technology	0 + 1
HS1102	Community Service	0 + 1
Semester II		
MS1302	Linear Algebra	3 + 0
EE2403	Fundamentals of Electronics	3 + 1
EE1407	Digital Logic Fundamentals	3 + 1
HS1101	Leadership and Motivation	1 + 0
HS1303	English I (Proficiency Development)	3 + 0
ME1204	Engineering Statics	2 + 0

YEAR -2

		CR-H
Semester III		
MS1304	Differential Equations and Transforms	3 + 0
EE2302	Electrical Network Analysis	3 + 0
ME2205	Engineering Dynamics	2 + 0
EE2404	Electronic Circuit Design	3 + 1
HS2304	English II (Public Speaking)	3 + 0
ME2201	Engineering Drawing	1 + 1
Semester IV		
MS2305	Complex Variables and Multivariable Calculus	3 + 0
EE2309	Signals and Systems	3 + 0
EE3405	Linear ICs and Applications	3 + 1
EE2425	Electrical Machines	3 + 1
ME2306	Engineering Thermodynamics	3 + 0

YEAR -3

		CR-H
Semester V		
EE3411	Linear Control Systems	3 + 1
EE3417	Microcontroller based Systems	3 + 1
EE2319	Electromagnetic Field Theory	3 + 0
EE3306	Instrumentation and Measurement	2 + 1
AE3201	Applied Aerodynamics	2 + 0
ME3306	Probability Methods in Engineering	3 + 0
Semester VI		
EE3410	Communication Systems	3 + 1
EE3416	Digital Signal Processing	3 + 1
EE3320	Microwave and Antennas	2 + 1
MG3301	Project Management	3 + 0
MS3306	Navigation Guidance and Control	3 + 0

YEAR -4

		CR-H
Semester VII		
AE3302	Radar Systems Engineering	3 + 0
AE4304	Flight Control Systems	3 + 1
EE4414	Computer Communication Networks	3 + 1
HS4206	Professional and Social Ethics	2 + 0
MS4307	Numerical Methods	3 + 0
DP4301	SDP-I	0 + 3
Semester VIII		
AE4305	Avionic System design	3 + 0
MG4302	Technology Entrepreneurship	3 + 0
HS3305	English III (Official Communication and Report Writing)	3 + 0
HS4306	Pakistan and Islamic Studies	3 + 0
	Emerging Aviation Technologies	1 + 0
DP4302	SDP-II	0 + 3

Degree Structure:

Duration : 4 Years (8 Regular Semesters)
Program Credits Hrs : 145
Engineering : 95 Cr Hrs
Non-Engineering : 44 Cr Hrs
Other Degree Requirement : 6 Cr Hrs
Eligibility : HSC (Pre-Engineering) with minimum 60% marks or A- levels (Physics, Chemistry and Mathematics) or DAE (in relevant field) with minimum 70% marks

BE Mechatronics
Engineering Courses

Knowledge Area	Courses	Theory Contact Hrs	Practical Contact Hrs	Credits Hrs	Total Courses	Total Credit Hrs
Computing	Introduction to Computer Programming	2	3	3	2	7
	Digital Logic Fundamentals	3	3	4		
Foundation	Engineering Drawing	1	3	2	11	32
	Workshop Technology	0	3	1		
	Engineering Statics	2	0	2		
	Engineering Dynamics	2	0	2		
	Linear Circuit Analysis	3	3	4		
	Electrical Machines	3	3	4		
	Fundamentals of Electronics	3	3	4		
	Fluid Mechanics	3	3	4		
	Mechanics of Materials	3	0	3		
	Material and Manufacturing Processes	3	0	3		
	Linear Systems Modeling	3	0	3		
Breadth	Fundamentals of Thermal Sciences	3	1	4	8	29
	Theory of Machines	3	0	3		
	Electrical Network Analysis	3	0	3		
	Electronic Circuit Design	3	3	4		
	Linear Integrated Circuits and Applications	3	3	4		
	Microcontroller Based Systems	3	3	4		
	Instrumentation and Measurement	2	3	3		
	Linear Control Systems	3	3	4		
Depth	Sensors and Actuators (Elective - 1)	3	3	4	6	21
	Robotics	3	3	4		
	Power Electronics (Elective - 2)	3	3	4		
	Machine Design	3	0	3		
	Mechatronic System Design	3	0	3		
	Industrial Control and Automation	2	3	3		
Senior Design Project	Senior Design Project - I	0	9	3	2	6
	Senior Design Project - II	0	9	3		
	Industrial Training (Summer)	0	0	0	0	0
Total Engineering Courses					29	95

BE Mechatronics

Non-Engineering Courses

Knowledge Area	Subject Area	Courses	Theory Contact Hrs	Practical Contact Hrs	Credits Hrs	Total Courses	Total Credit Hrs
Humanities	English	English I (Proficiency Development) English II (Public Speaking) English III (Official Communication and Report Writing)	3 3 3	0 0 0	3 3 3	3	9
	Culture	Islam and Pakistan Studies	3	0	3	1	3
	Social Sciences	Professional and Social Ethics Leadership and Motivation Community Service	2 1 0	0 0 3	2 1 1	3	4
Management Sciences		Engineering Project Management Technology Entrepreneurship	3 3	0 0	3 3	2	6
Natural Sciences	Math	Calculus Linear Algebra Differential Equations and Transforms Complex Variables and Multivariable Calculus Numerical Methods Probability Methods in Engineering	3 3 3 3 3 3	0 0 0 0 0 0	3 3 3 3 3 3	6	18
	Physics	Engineering Physics	3	3	4	1	4
Sub Total Non-Engineering Courses			42	6	44	16	44
Industrial Training (Summer Internships)		Internship I & II		2			2
Physical Training & Education (Sports)		Sports (Indoor/Outdoor)		4			4
Sub Total Other Degree Requirements				6			6
Total Program						44	145

Location: PAF-KIET Main Campus

Comprehensive exam is a mandatory requirement. Student must clear this exam to become eligible for the degree. The curriculum structure, duration and scheduling of each degree program are subject to change without notice.

Scheme of Studies:
BE Mechatronics

YEAR -1

		CR-H
Semester I		
EE1401	Linear Circuit Analysis	3 + 1
MS1401	Engineering Physics	3 + 1
CS1301	Introduction to Computer Programming	2 + 1
MS1303	Calculus	3 + 0
HS1101	Leadership and Motivation	1 + 0
HS1102	Community Service	0 + 1
Semester II		
MS1302	Linear Algebra	3 + 0
ME1102	Workshop Technology	0 + 1
EE2403	Fundamentals of Electronics	3 + 1
EE1407	Digital Logic Fundamentals	3 + 1
HS1303	English I (Proficiency Development)	3 + 0
ME1204	Engineering Statics	2 + 0

YEAR -2

		CR-H
Semester III		
ME2205	Engineering Dynamics	2 + 0
MS1304	Differential Equations and Transforms	3 + 0
EE2302	Electrical Network Analysis	3 + 0
EE2404	Electronic Circuit Design	3 + 1
HS2304	English II (Public Speaking)	3 + 0
ME2201	Engineering Drawing	1 + 1
Semester IV		
MS2305	Complex Variables and Multivariable Calculus	3 + 0
ME2311	Linear Systems Modeling	3 + 0
EE3405	Linear ICs and Applications	3 + 1
ME2310	Materials and Manufacturing Processes	3 + 0
EE2425	Electrical Machines	3 + 1

YEAR -3

		CR-H
Semester V		
EE3417	Microcontroller-Based Systems	3 + 1
EE3411	Linear Control Systems	3 + 1
ME3326	Theory of Machines	3 + 0
ME2309	Mechanics of Materials	3 + 0
ME3307	Fundamentals of Thermal Sciences	3 + 1
Semester VI		
EE3306	Instrumentation and Measurement	2 + 1
ME3408	Fluid Mechanics	3 + 1
ME3212	Machine Design	3 + 0
EE3327	Power Electronics	3 + 1
MG3301	Project Management	3 + 0
MS3306	Probability Methods in Engineering	3 + 0

YEAR -4

		CR-H
Semester VII		
ME4314	Mechatronic System design	3 + 0
HS4206	Professional and Social Ethics	2 + 0
MS4307	Numerical Methods	3 + 0
EE4321	Industrial Control and Automation	2 + 1
ME4313	Sensors and Actuators	3 + 1
DP4301	SDP-I	0 + 3
Semester VIII		
MG4302	Technology Entrepreneurship	3 + 0
HS3305	English III (Official Communication and Report Writing)	3 + 0
HS3306	Pakistan and Islamic Studies	3 + 0
EE4422	Introduction to Robotics	3 + 1
DP4302	SDP-II	0 + 3