



**Engineering**





## Introduction

**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, Mechatronics and Software Engineering approved by Pakistan Engineering Council. A PEC approved degree adds more value as it follows Outcome Based Education System (OBE) under the Washington accord. As a result all BE Programs of KIET including BE Electrical, BE Mechatronics, BE Avionics and BE Software are recognized as equivalent degree in Washington accord partner countries. Moreover PEC ensure many strict checks & Balances to ensure high quality standards of the program.**

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

### Vision

"To impart highest quality engineering education with an aim to produce proficient, creative and ethical electrical engineers who can take the role of visionary leaders, entrepreneurs and researchers at national and global levels".

### Mission

"To educate students through highly qualified faculty to have strong theoretical and practical expertise, team-work, leadership qualities, ethical values and entrepreneurship skills. Establish and maintain state-of-the-art laboratories, latest curriculum and industrial linkages. Prepare graduates to pursue higher studies and undertake research at national and global levels."

## 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 designers, 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 exists 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

##### Vision

"To be a center of excellence in Avionics Engineering, where a multi-disciplinary foundation, technological depth and inculcation of ethical values produces visionary professionals at national and global levels with a focus on research and entrepreneurship".

**Mission**

"To educate students through highly qualified faculty to have strong theoretical and practical expertise, team-work, leadership qualities, ethical values and entrepreneurship skills. Establish and maintain state-of-the-art laboratories, latest curriculum and industrial linkages. Prepare graduates to pursue higher studies and undertake research at national and global levels".

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 approved 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****Vision**

"We envision to be a center of excellence in Mechatronics engineering where highest quality education produces ethical and visionary professionals at national and global levels with a focus on research and entrepreneurship".

**Mission**

"To educate students through highly qualified faculty to have strong theoretical and practical expertise, team-work, leadership qualities, ethical values and entrepreneurship skills. Establish and maintain state-of-the-art laboratories, latest curriculum and industrial linkages. Prepare graduates to pursue higher studies and undertake research at national and global levels".

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 approved 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.

#### BE Software Engineering:

KIET has launched BE Software Engineering after seeking formal approval from Pakistan Engineering Council (PEC). This program will prepare students for the ever increasing demand of Software Engineers nationally and internationally. Software Engineering is the application of engineering to the development of software in a systematic method. The program vision, mission and curriculum details are prepared in line with HEC guidelines.



### Vision

“To impart highest quality engineering education with an aim to produce proficient, creative and ethical software engineers who can take the role of visionary leaders, entrepreneurs and researchers at national and global levels.”

### Mission

“To educate students through highly qualified faculty to have strong theoretical and practical expertise, team-work, leadership qualities, ethical values and entrepreneurship skills. Establish and maintain state-of-the-art laboratories, latest curriculum and industrial linkages. Prepare graduates to pursue higher studies and undertake research at national and global levels.”

### Program Objectives

- The graduates will apply their engineering knowledge to critically investigate and analyze the complex technological challenges faced by the nation and be able to design sustainable solutions for them based on modern tools and practices while meeting high ethical standards.
- The graduates will compete proactively in both local and international, industry and academia, by indulging in a lifelong

process of research and development in their individual capacity as well as members of project teams to match the pace of the rapidly changing world of technology to transform Pakistan into a knowledge based economy.

- The graduates will use their knowledge and skills to effectively contribute towards engineering jobs’ creation by undertaking roles as entrepreneurs and project managers/ marketers to undertake new technological projects in the country for continued indigenization of technology for sustainable economy.

### 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. All BE programs at KIET are PEC accredited.

#### **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)

Student's Engineering Exhibition (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



*Pakistan's first indigenously developed 4-DOF Motion-Actuated Flight Simulator for Real-Time Testing of Flight Control Computers*



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. 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, software houses, chemicals and medical instruments.

Graduates of BE 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 infrastrucure, 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.



## External Research Funding in Millions

Summary	Funding Source	Title	Status	Million PKR
Dr. Husain/ Mohiuddin FPGA	Ignite	Design and Development of Application-Specific FPGA/Reconfigurable Hardware Generator	Completed	13.3
Dr. Imran/Husain	Ignite	Design and Development of an FPGA-based Face Recognition System	Completed	13.8
Dr. Husain Umm-al-Qura	Umma-al-Qura	Design and exploration of Logic Intensive Reconfigurable Architectures and related CAD tools	Completed	2
Dr. Imran Naseem	NRC	Large Scale GIS Data Processing Lab	Approved	54
Dr. Muhammad Bilal	Ignite	Design and development of Intelligent Mobile Robots (IMRs) for disaster mitigation and firefighting	Completed	14.6
Dr. M Bilal/Dr. Adil	PAF	Indigenous development of the flight dynamic model of C-130 aircraft for full flight simulator	In progress	3
Dr. Arsalan	AeroTrain	Arinc Trainer 429	Completed	0.5
Dr. Sarmad	HEC	HEC Startup Research Grant	In progress	0.45
Dr. Arsalan	KACST	KACST LVDS Transceiver	Completed	4
Dr. Arsalan	UAE Al-Ain	UAE Al-Ain WPT Vaccine Monitoring ASIC	Completed	2
Dr. Arsalan	Efables USA	Efables Low power Bandgap Reference	Completed	0.5
Dr. Arsalan	Ohio State University	High speed, high density APR of arbitrary wave generator	Completed	1
Dr. Arsalan	Ignite	Monolithic CMOS Microsystems for Structural, Chemical and Bio Hazard Detection	In progress	33
Dr. Arsalan	NRC	Nanotech Engineering Lab	Approved	41
Dr. Arsalan	NRPU	A Mid-range wireless power transfer system for portable electronic devices with beam forming	Approved	8.2
Dr. Arsalan	Zhejiang University, China	GMI bio sensor	In progress	6
Dr. Arsalan	AVID, PAC, Kamra	Project with Kamra	In progress	2.4
Dr. Arsalan	NESCOM	Project with NESCOM	In progress	5
Dr Arsalan IC Design	South East China University, China	Integrated Bio-GMI sensor and Electronics	In progress	4

## Recent Research Publications

Name of Author	Title of Paper	Name of Journal with Details of Publications
Sarmad Ahmed Shaikh and Andrea M. Tonello	"Radio Source Localization in Multipath Channels Using EM Lens Assisted Massive Antennas Arrays,"	*IEEE Access*, vol. 7, pp. 9001-9012, 2019
Sarmad Ahmed Shaikh and Andrea M. Tonello,	"Comparison of Two Baseline AoA Estimation Methods in a EM Lens Assisted MAA System,"	*23rd International ITG Workshop on Smart Antennas*, Vienna, Austria, 2019, pp. 1-5
M. Arif, Imran Naseem, M. Moinuddin and M. N. Iqbal	"Improved Optimum Error Nonlinearities Using Cramer–Rao Bound Estimation"	Circuits, Systems and Signal Processing, 2019. (Impact Factor: 1.98)
Alishba Sadiq; Shujaat Khan; Imran Naseem; Roberto Togneri; M. Bennamoun	"Enhanced q-Least Mean Square"	Circuits, Systems and Signal Processing, 2019. (Impact Factor: 1.98)
Muhammad Arif; Imran Naseem; M. Moinuddin; Ubaid M. Al-Saggaf	"Modified Incremental LMS with Improved Stability via Convex Combination of Two Adaptive Filters"	Circuits, Systems and Signal Processing, 2019. (Impact Factor: 1.98)
M. Naveed, Sameer Qazi, Syed M. Atif, Bilal A. Khawaja and Muhammad Mustaqim	"SCRAS Server-Based Crosslayer Rate Adaptive Video Streaming over 4G-LTE for UAV-Based Surveillance Applications"	MDPI Electronics 2019, 8(8), 910, DOI: 10.3390/electronics8080910, ISSN 2079-9292, 2019 (Impact Factor 1.764)
Syed Muhammad Atif, Sameer Qazi and Nicolas Gillis	"Improved SVD-based Initialization for Nonnegative Matrix Factorization using Low-Rank Correction"	Pattern Recognition Letters, Volume 122, 2019, Pages 53-59, DOI: 10.1016/j.patrec.2019.02.018, ISSN 0167-8655, 2019 (Impact Factor: 1.995)
M. Mustaqim, Bilal A. Khawaja, Asghar A. Razzaqi, Syed Sajjad H. Zaidi, Syed A. Jawed and Sameer Qazi	"Wideband and High Gain Antenna Arrays for UAV-to-UAV and UAV-to- Ground Communication In Flying Ad-Hoc Networks (FANETs)"	Microwave and Optical Technology Letters, Volume 60, Issue 5, 1164-1170, DOI: 10.1002/mop.31130, ISSN: 0895-2477, 2018 (Impact Factor: 0.585)
Sameer Qazi and Muhammad Bilal Kadri	"Revisiting Constraint Based GeoLocation: Improving Accuracy through Removal of Outliers"	International Arab Journal of Information Technology, Vol 15, Issue 2, pp 232-239, Mar 2018 (ISI indexed with Impact Factor: 0.724)
M. Arif, I. Naseem, M. Moinuddin and U. M Al-Saggaf	"Design of an Intelligent q-LMS Algorithm for Tracking a Non-stationary Channel"	Arabian Journal for Science and Engineering October. 2017

## Recent Research Publications

Name of Author	Title of Paper	Name of Journal with Details of Publications
Sameer Qazi, Syed M. Atif and Muhammad Bilal Kadri	"A Novel Compressed Sensing Technique for Traffic Matrix Estimation of Software Defined Cloud Networks"	KSII Transactions on Internet and Information Systems Volume 12, Issue 10 pp. 4678-4702, 2018. DOI: 10.3837/tiis.2018.10.004 , eISSN: 1976-7277, 2018 (Impact Factor: 0.611)
Sameer Qazi and Muhammad Bilal Kadri	"Revisiting Constraint Based GeoLocation: Improving Accuracy Through Removal of Outliers",	International Arab Journal of Information Technology, Vol 15, No 2, Mar 2018
M. Arif, Imran Naseem, M.Moinuddin, Ubaid Saggaf	"Design of an Intelligent q-LMS Algorithm for Tracking a Non-stationary Channel"	Arabian Journal of Science and Engineering 2017
M. Moinuddin, Imran Naseem, Sidi A Bencherif, Wassem Aftab, Adnan Memic	"A Weighted Cosine RBF Neural Networks	Journal of Molecular Biology and Biotechnology, Vol. 2, No. 2:4, 2017
Shujaat Khan, Jawwad Ahmed, Imran Naseem and M.Moinuddin	"A Novel Fractional Gradient-Based Learning Algorithm for Recurrent Neural Networks"	Circuits, Systems and Signal Processing, 2017
Ali Asghar, M. Mazher Iqbal, Waqar Ahmed, Mujahid Ali, Husain Parvez, M. Rashid	Exploring Shared SRAM Tables in FPGAs for Larger LUTs and Higher Degree of Sharing	International Journal of Reconfigurable Computing Volume 2017
Yasir Siddiqi, Syed Arsalan Jawed, Naveed Ahmed,	PVT-tolerant Current Reference Generation Using Different PTAT Currents	Microelectronics Journal 66 (2017) 112–118
S.A Jawed, A Asghar, K. Khan, S Abbasi, M Naveed, Y. Siddiqi, W. Siddiqi	A Configurable 2-Gbps LVDS Transceiver in 150-nm CMOS with Pre-Emphasis, Equalization, and Slew Rate Control	International Journal of Circuit Theory and Applications 45 (10), 1369-1381
M. Sulaiman BenSaleh, SA Jawed, Yasir Siddiqi	US Patent 9,785,178, Precision Current Reference Generator Circuit SMQ	
MB Kadri Najam M. Amin	Model-Free Fuzzy Adaptive Control for MIMO Systems, 2017 60 GHz-Band Low Noise Amplifier, Accepted for Publication by the Journal of Circuits, Systems and Computers, (SCI)	Arabian Journal for Science and Engineering To be published in JCSC Vol. 26, Issue 5 (May 2017)

## Recent Research Publications

Name of Author	Title of Paper	Name of Journal with Details of Publications
Sameer Qazi	Singular Valued Differential Link Count Linear Estimator for Traffic Matrix of Large Cloud Computing Networks	978-1-5386-2969-7/17/\$31.00 ©2017 IEEE
M. Arif, I. Naseem; S. S. U. Qadri; M. Moynuddin	Two-Dimensional Optimum Error Nonlinearity for Image Denoising	1st International Conference on Latest Trends in Electrical Engineering and Computing Technologies (INTELLECT) 2017, Pakistan
M. Arif, I. Naseem, M. Moynuddin	State-Space Fractional-Least Mean Square Algorithm	1st International Conference on Latest Trends in Electrical Engineering and Computing Technologies (INTELLECT) 2017, Pakistan
Ali Asghar, M. Mazher Iqbal, Waqar Ahmed, Mujahid Ali, Husain Parvez, M. Rashid	Logic Algebra for Exploiting Shared SRAM Table Based FPGA for Large LUT Inputs	1st International Conference on Latest Trends in Electrical Engineering and Computing Technologies (INTELLECT) 2017, Pakistan
Muhammad Mazhar Iqbal, Husain Parvez	Optimizing Routing Network of Shared Hardware Design for Multiple Application Circuits	1st International Conference on Latest Trends in Electrical Engineering and Computing Technologies (INTELLECT) 2017, Pakistan
Ayesha Hassan, Naveed, Asma Mahar, Sidra Saeed Yasir Siddiqui, Arsalan Jawed	Efficiency Improvement of a Wireless Power Transfer System	2nd International Electrical Engineering Conference (IEEC 2017)
Asma Mahar, Ayesha Hassan, Naveed, Arham Iqbal, Madiha Azhar, Yasir, Arsalan Jawed	Actively Biased Differential Drive Rectifier Circuit with Backscattering Communication	2nd International Electrical Engineering Conference (IEEC 2017)
Naveed, Ayesha Hassan, Asma Mahar, Yasir, M. Mustaqim, Arsalan Jawed	Temperature Sensors and Interface For Ultra-Low Power Microsystems	2nd International Electrical Engineering Conference (IEEC 2017)
Shujaat Khan, M. Usman, Imran Naseem, Roberto Togneri and M. Bennamoun	VP-FLMS: A Novel Variable Power Fractional LMS Algorithm	9th International Conference on Ubiquitous and Future Networks (ICUFN) 2017, Milan

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

Duration	: 4 Years (8 Regular Semesters)
Program Credits Hrs	: 143
Engineering	: 98 Cr Hrs
Non-Engineering	: 39 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 Computing	1	3	2	3	8
	Introduction to Computer Programming	2	3	3		
	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		
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
	Fundamentals of Thermal Sciences	3	0	3		
Depth	Elective I	3	3	4	5	18
	Elective II	3	3	4		
	Elective III	2	3	3		
	Elective IV	3	0	3		
	Elective V	3	3	4		
Project	Senior Design Project I	0	9	3	2	6
	Senior Design Project II	0	9	3		
<b>Total Engineering Courses</b>		<b>73</b>	<b>75</b>	<b>98</b>	<b>30</b>	<b>98</b>

## 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	4	11
	Introduction to Computer Programming	2	3	3		
	Algorithms and Data Structures	2	3	3		
	Object Oriented Programming	2	3	3		
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	24
	Operating System	3	3	4		
	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
	Artificial Intelligence	2	1	3		
Depth	Elective I	3	3	4	5	19
	Elective II	3	3	4		
	Elective III	3	3	4		
	Elective IV	3	3	4		
	Elective V	3	0	3		
Project	Senior Design Project I	0	9	3	2	6
	Senior Design Project II	0	9	3		
<b>Total Engineering Courses</b>		<b>70</b>	<b>80</b>	<b>98</b>	<b>29</b>	<b>98</b>

## 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)	2	0	2	3	7
		English II (Public Speaking)	2	0	2		
		English III (Official Communication and Report Writing)	3	0	3		
	Culture Social Sciences	Islam and Pakistan Studies	3	0	3	1	3
		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	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	39	15	39
Industrial Training (Summer Internships)		Internship I & II		2			2
Physical Training & Sports		Sports (Indoor/Outdoor)		4			4
Sub Total Other Degree Requirements					6		6
Total Program						45	143

### Depth Courses (Electronics Major)

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

### 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

### Depth Courses (Computer Systems Major)

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



## Scheme of Studies: BE Electrical (Major in Electronics)

YEAR -1		CR-H
<b>Semester I</b>		
CS1201	Introduction to Computing	1 + 1
EE1401	Linear Circuit Analysis	3 + 1
MS1303	Calculus	3 + 0
MS1401	Engineering Physics	3 + 1
HS1101	Leadership and Motivation	1 + 0
HS1303	English-I (Proficiency Development)	2 + 0
<b>Semester II</b>		
CS1301	Introduction to Computer Programming	2 + 1
ME2201	Engineering Drawing	1 + 1
MS1302	Linear Algebra	3 + 0
EE2403	Fundamentals of Electronics	3 + 1
ME1303	Engineering Mechanics	3 + 0
ME1102	Workshop Technology	0 + 1
HS2304	English - II (Public Speaking)	2 + 0

YEAR -3		CR-H
<b>Semester V</b>		
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
<b>Semester VI</b>		
EE3410	Communication Systems	3 + 1
EE4427	Elective-1, Power Electronics	3 + 1
MG3301	Project Management	3 + 0
MS3306	Probability Methods in Engineering	3 + 0
EE3416	Elective-2, Digital Signal Processing	3 + 1

YEAR -2		CR-H
<b>Semester III</b>		
MS1304	Differential Equations and Transforms	3 + 0
HS1102	Community Service	0 + 1
EE2302	Electrical Network Analysis	3 + 0
CS2302	Algorithms and Data Structures	2 + 1
EE2404	Electronic Circuit Design	3 + 1
EE1407	Digital Logic Fundamentals	3 + 1
<b>Semester IV</b>		
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 -4		CR-H
<b>Semester VII</b>		
HS4206	Professional and Social Ethics	2 + 0
MS4307	Numerical Methods	3 + 0
EE4321	(Elective-3) Industrial Control and Automation / Integrated Digital Electronics	2 + 1
EE	(Elective-4) Embedded System Design / Digital Image Processing	3 + 0
EE3320	Microwave and Antennas	2 + 1
DP4301	SDP-I	0 + 3
<b>Semester VIII</b>		
MG4302	Technology Entrepreneurship	3 + 0
HS3305	English III (Official Communication and Report Writing)	3 + 0
HS4306	Pakistan and Islamic Studies	3 + 0
EE4423	(Elective-5) FPGA-Based System Design / Intro. to Robotics / Computer Communication Networks	3 + 1
DP4302	SDP II	0 + 3

## Scheme of Studies: BE Electrical (Major in Telecom)

YEAR -1		CR-H
<b>Semester I</b>		
CS1201	Introduction to Computing	1 + 1
EE1401	Linear Circuit Analysis	3 + 1
MS1303	Calculus	3 + 0
MS1401	Engineering Physics	3 + 1
HS1101	Leadership and Motivation	1 + 0
HS1303	English I (Proficiency Development)	2 + 0
<b>Semester II</b>		
CS1301	Introduction to Computer Programming	2 + 1
ME2201	Engineering Drawing	1 + 1
MS1302	Linear Algebra	3 + 0
EE2403	Fundamentals of Electronics	3 + 1
ME1303	Engineering Mechanics	3 + 0
ME1102	Workshop Technology	0 + 1
HS2304	English II (Public Speaking)	2 + 0

YEAR -2		CR-H
<b>Semester III</b>		
MS1304	Differential Equations and Transforms	3 + 0
HS1102	Community Service	0 + 1
EE2302	Electrical Network Analysis	3 + 0
CS2302	Algorithms and Data Structures	3 + 1
EE2404	Electronic Circuit Design	3 + 1
EE1407	Digital Logic Fundamentals	3 + 1
<b>Semester IV</b>		
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
EE2408	Computer Architecture and Organization	3 + 1

YEAR -3		CR-H
<b>Semester V</b>		
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
<b>Semester VI</b>		
EE3410	Communication Systems	3 + 1
EE3320	Microwave and Antenna	2 + 1
MG3301	Project Management	3 + 0
MS3306	Probability Methods in Engineering	3 + 0
EE3416	Elective I Digital Signal Processing	3 + 1

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

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

YEAR -1		CR-H
<b>Semester I</b>		
CS1201	Introduction to Computing	1 + 1
EE1401	Linear Circuit Analysis	3 + 1
MS1303	Calculus	3 + 0
MS1401	Engineering Physics	3 + 1
HS1101	Leadership and Motivation	1 + 0
HS1303	English I (Proficiency Development)	2 + 0
<b>Semester II</b>		
CS1301	Introduction to Computer Programming	2 + 1
ME2201	Engineering Drawing	1 + 1
MS1302	Linear Algebra	3 + 0
EE2403	Fundamentals of Electronics	3 + 1
ME1303	Engineering Mechanics	3 + 0
ME1102	Workshop Technology	0 + 1
HS2304	English II (Public Speaking)	2 + 0

  

YEAR -2		CR-H
<b>Semester III</b>		
MS1304	Differential Equations and Transforms	3 + 0
HS1102	Community Service	0 + 1
EE2302	Electrical Network Analysis	3 + 0
CS2302	Algorithms and Data Structures	2 + 1
EE2404	Electronic Circuit Design	3 + 1
EE1407	Digital Logic Fundamentals	3 + 1
<b>Semester IV</b>		
CS2403	Database Management System	3 + 1
EE2308	Computer Architecture and Organization	3 + 1
SE201	Object Oriented Programming	2 + 1
MS2305	Complex Variables and Multivariable Calculus	3 + 0
CSxxxx	Artificial Intelligence	2 + 1

  

YEAR -3		CR-H
<b>Semester V</b>		
EE3411/	Elective I, Linear Control Systems/ Computer Graphics /	3 + 1
CS3401	Advanced Computer Architecture / Parallel Processing	
MS3306	Probability Methods in Engineering	3 + 0
EE3417	Microprocessor based Systems	3 + 1
EE2309	Signals and Systems	3 + 0
CS3301	Operating System	3 + 1
<b>Semester VI</b>		
CS3411	Software Engineering	3 + 1
EE3410	Communication Systems	3 + 1
EE3416	Elective-II, Emerging Technologies	3 + 1
MS4307	Numerical methods	3 + 0
MG3301	Project Management	3 + 0

  

YEAR -4		CR-H
<b>Semester VII</b>		
CS4401/	Elective III, FPGA based Systems Design /	3 + 1
EE4423/	Introduction to Robotics	
EE4422		
DP4301	SDP-I	0 + 3
HS4206	Professional and Social Ethics	2 + 0
EE4414	Computer Communication Networks	3 + 1
EE3416	Elective IV, Digital Signal Processing	3 + 1
<b>Semester VIII</b>		
EE4325/	Elective-V, Digital Image Processing /	3 + 0
EE4324/	Embedded Systems / Wireless and Mobile	
EE4313	Communication	
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

## Degree Structure:

Duration	: 4 Years (8 Regular Semesters)
Program Credits Hrs	: 144
Engineering	: 102 Cr Hrs
Non-Engineering	: 36 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/Manufacturing Process & CNC Machines	1	3	2	12	38
	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	23
	Flight Control Systems	3	3	4		
	Navigation Guidance and Control	3	0	3		
	Avionic Systems Design	2	6	4		
	Digital Signal Processing	3	3	4		
	Microwave and Antennas/Adv, Digital System Design	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		
Total Engineering Courses		76	78	102	32	102

## 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)	2	0	2	3	7
		English II (Public Speaking)	2	0	2		
		English III (Official Comm. and Report Writing)	3	0	3		
	Culture	Islam and Pakistan Studies	3	0	3	1	3
	Social Sciences	Professional and Social Ethics	Leadership and Motivation	1	0	1	3
Community Service			0	3	1		
Engineering Project Management			3	0	3		
Management Sciences		Technology Entrepreneurship	3	0	3	2	6
Natural Sciences	Math	Calculus	3	0	3	4	12
		Linear Algebra	3	0	3		
		Differential Equations and Transforms	3	0	3		
		Complex Variables and Multivariable Calculus	3	0	3		
	Physics	Engineering Physics	3	3	4	1	4
Sub Total Non-Engineering Courses			34	6	36	14	36
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						46	144

**Location: KIET Main Campus**

*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
<b>Semester I</b>		
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
<b>Semester II</b>		
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)	2 + 0
ME1204	Engineering Statics	2 + 0
HS4206	Professional and Social Ethics	2 + 0

  

YEAR -2		CR-H
<b>Semester III</b>		
MS1304	Differential Equations and Transforms	3 + 0
EE2302	Electrical Network Analysis	3 + 0
ME2205	Engineering Dynamics	2 + 0
EE2404	Electronic Circuit Design	3 + 1
EE3417	Microcontroller based Systems	3 + 1
ME2201/02	Elective - I	1 + 1
<b>Semester IV</b>		
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
AE3201	Applied Aerodynamics	2 + 0

  

YEAR -3		CR-H
<b>Semester V</b>		
EE3411	Linear Control Systems	3 + 1
EHS2304	English II (Public Speaking)	2 + 0
EE2319	Electromagnetic Field Theory	3 + 0
EE3306	Instrumentation and Measurement	2 + 1
ME3306	Fundamental to Thermal Sciences	3 + 0
MS3306	Probability Methods in Engineering	3 + 0
<b>Semester VI</b>		
EE3410	Communication Systems	3 + 1
EE3416	Digital Signal Processing	3 + 1
EE3320/21	Elective - II	2 + 1
MG3301	Project Management	3 + 0
AE3306	Navigation Guidance and Control	3 + 0

  

YEAR -4		CR-H
<b>Semester VII</b>		
AE3302	Radar Systems Engineering	3 + 1
AE4304	Flight Control Systems	3 + 1
EE4414	Computer Communication Networks	3 + 1
MS4307	Numerical Methods	3 + 0
DP4301	SDP-I	0 + 3
<b>Semester VIII</b>		
AE4305	Avionic System design	2 + 0
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
AE4102	Emerging Aviation Technologies	1 + 0

  

Electives		CR-H
ME2201	(Elective – I) Engineering Drawing	1+1
ME2202	(Elective – I) Manufacturing Process & CNC Machines	1+1
EE3320	(Elective – II) Microwave and Antenna	2+1
EE3321	(Elective – II) Advanced Digital System Design	2+1

## Degree Structure:

Duration	: 4 Years (8 Regular Semesters)
Program Credits Hrs	: 146
Engineering	: 100 Cr Hrs
Non-Engineering	: 40 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 Digital Logic Fundamentals	2 3	3 3	3 4	2	7
Foundation	Engineering Drawing Workshop Technology Engineering Statics Engineering Dynamics Linear Circuit Analysis Electrical Machines Fundamentals of Electronics Fluid Mechanics Mechanics of Materials Material and Manufacturing Processes Signals & Systems	0 0 3 3 3 3 3 3 3 3 3 2	6 3 0 0 3 3 3 3 0 0 0 0	2 2 3 4 4 4 4 4 3 3 3 2	11	34
Breadth	Fundamentals of Thermal Sciences Theory of Machines Electrical Network Analysis Electronic Circuit Design Linear Integrated Circuits and Applications Microcontroller Based Systems Instrumentation and Measurement Linear Control Systems	3 3 3 3 3 3 2 3	3 0 0 3 3 3 3 3	4 3 3 4 4 4 3 4	8	29
Depth	Sensors and Actuators (Elective - 1) Robotics Power Electronics (Elective - 2) Mobile Robotics (Elective - 3) Machine Design Mechatronic System Design Industrial Control and Automation	3 3 3 3 3 2 2	3 3 3 0 0 3 3	4 4 4 3 3 3 3	7	24
Senior Design Project	Senior Design Project - I Senior Design Project - II Industrial Training (Summer)	0 0 0	9 9 0	3 3 0	2 0	6 0
<b>Total Engineering Courses</b>					<b>30</b>	<b>100</b>

## 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 II (Public Speaking)	2	0	2	2	5
		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	6	18
		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		
	Probability Methods in Engineering	3	0	3			
Physics	Engineering Physics	3	3	4	1	4	
Sub Total Non-Engineering Courses			38	6	40	15	40
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	146

Location: KIET Main Campus

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
<b>Semester I</b>		
EE1401	Linear Circuit Analysis	3 + 1
MS1401	Engineering Physics	3 + 1
CS1301	Introduction to Computer Programming	2 + 1
MS1303	Calculus	3 + 0
ME1202	Workshop Technology	0 + 2
HS1102	Community Service	0 + 1
<b>Semester II</b>		
MS1302	Linear Algebra	3 + 0
EE2403	Fundamentals of Electronics	3 + 1
HS1101	Leadership and Motivation	1 + 0
EE1407	Digital Logic Fundamentals	3 + 1
ME1204	Engineering Statics	3 + 0
ME2201	Engineering Drawing	0 + 2

YEAR -2		CR-H
<b>Semester III</b>		
ME2205	Engineering Dynamics	3 + 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)	2 + 0
ME2309	Mechanics of Materials	3 + 0
<b>Semester IV</b>		
MS2305	Complex Variables and Multivariable Calculus	3 + 0
EE2209	Signal & Systems	2 + 0
EE3405	Linear ICs and Applications	3 + 1
ME3408	Fluid Mechanics	3 + 1
EE2425	Electrical Machines	3 + 1

YEAR -3		CR-H
<b>Semester V</b>		
EE3417	Microcontroller-Based Systems	3 + 1
EE3411	Linear Control Systems	3 + 1
ME3326	Theory of Machines	3 + 0
EE3306	Instrumentation and Measurement	2 + 1
ME3307	Fundamentals of Thermal Sciences	3 + 1
<b>Semester VI</b>		
HS4206	Professional and Social Ethics	2 + 0
ME2310	Material and Manufacturing Processes	3 + 0
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
<b>Semester VII</b>		
MTE4314	Mechatronic System Design	2 + 1
MTE4320	Introduction to Robotics	3 + 1
EE4321	Industrial Control and Automation	2 + 1
MTE4313	Sensors and Actuators	3 + 1
DP4301	SDP-I	0 + 3
<b>Semester VIII</b>		
MG4302	Technology Entrepreneurship	3 + 0
HS3305	English III (Official Communication and Report Writing)	3 + 0
HS3306	Pakistan and Islamic Studies	3 + 0
MS4307	Numerical Methods	3 + 0
MTE4321	Mobile Robotics	3 + 0
DP4302	SDP-II	0 + 3

## Degree Structure:

Duration	: 4 Years (8 Regular Semesters)
Program Credits Hrs	: 143
Engineering	: 93 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 Software Engineering

Knowledge Area	Courses	Theory Contact Hrs	Practical Contact Hrs	Credits Hrs	Total Courses	Total Credit Hrs
General Education	English I (Proficiency Development)	2	0	2	6	15
	English II (Public Speaking)	2	0	2		
	English III ( Official Communication and Report Writing)	3	0	3		
	Islam and Pakistan Studies	3	0	3		
	Professional and Social Ethics / Sociology	2	0	2		
	Introduction to Computing	2	3	3		
University Electives	Community Service	0	3	1	3	5
	Technology Entrepreneurship	3	0	3		
	Leadership and Motivation	1	0	1		
Mathematics and Science Foundation	Calculus and Analytical Geometry	3	0	3	5	16
	Probability and Statistics	3	0	3		
	Linear Algebra	3	0	3		
	Applied Physics	3	3	4		
	Differential Equations & Transforms	3	0	3		
Computing Core	Programming Fundamentals	2	3	3	14	46
	Discrete Structures	3	0	3		
	Object Oriented Concepts & Programming	2	3	3		
	Software Engineering	3	0	3		
	Algorithm Analysis and Data Structures	3	3	4		
	Digital Logic Design	3	3	4		
	Computer Architecture and Organization	3	3	4		
	Database Management System	3	3	4		
	Operating System	3	3	4		
	Computer Communication & Networks	3	3	4		
	Automata Theory & Formal Languages	3	0	3		
	Current programming trends	0	3	1		
	Senior Design Project -1	0	9	3		
	Senior Design Project -2	0	9	3		

## BE Software Engineering

Knowledge Area	Courses	Theory Contact Hrs	Practical Contact Hrs	Credits Hrs	Total Courses	Total Credit Hrs
Domain SE Core	Human Computer Interaction	3	0	3	7	22
	Software Construction and Development	2	3	3		
	Software Design and Architecture	2	3	3		
	Software Project Management	2	3	3		
	Software Quality Engineering	2	3	3		
	Software Requirement Engineering	3	0	3		
	Mobile Computing / Web Engineering	3	3	4		
Domain SE Electives	Computer Graphics / Game Programming / Formal Software Specification	2	3	3	6	22
	AI and Neural Networks	3	3	4		
	Microprocessor based Systems Design	3	3	4		
	Compiler Construction	3	3	4		
	Big Data Analytics / FPGA / DSP / LCS / Information Security	3	3	4		
	Distributed Computing/ Embedded / DIP/ Introduction to Robotics / Cloud Computing	3	0	3		
Domain SE Supporting	Fundamentals of Electronics	3	3	4	3	11
	Linear System Modeling	3	0	3		
	Linear Circuit Analysis	3	3	4		
Total					44	137
Industrial Training (Summer Internships)	Internship I & II		2			2
Physical Training & Sports	Sports (Indoor/Outdoor)		4			4
Sub Total Other Degree Requirements			6			6
Total Program					45	143

**Location: KIET Main Campus**

*The curriculum structure, duration and scheduling of each degree program are subject to change without notice.*

## Scheme of Studies: BE Software Engineering

YEAR -1		CR-H
<b>Semester I</b>		
CS1303	Introduction to Computing	2 + 1
CS1304	Programming Fundamentals	2 + 1
MS1303	Calculus and Analytical Geometry	3 + 0
MS1401	Applied Physics	3 + 1
HS1303	English-1 (Proficiency development)	2 + 0
HS1101	Leadership and Motivation	1 + 0
<b>Semester II</b>		
CS1306	Discrete Structures	3 + 0
CS1305	Object Oriented Concepts & Programming	2 + 1
EE1401	Linear Circuit Analysis	3 + 1
HS1102	Community Service	0 + 1
HS2304	English-2 (Public speaking)	2 + 0
HS4306	Pakistan and Islamic Studies	3 + 0

YEAR -3		CR-H
<b>Semester V</b>		
SE4302	Software Design and Architecture	2 + 1
CS3302	Automata Theory & Formal Languages	3 + 0
HS3305	English-3 (Official Communication & Report writing)	3 + 0
EE3417	Microprocessor based Systems Design	3 + 1
MS3306	Probability and Statistics	3 + 0
CS4304 /	Computer Graphics /	2 + 1
CS4305 /	Game Programming /	
SE4303	Formal Software Specification	
<b>Semester VI</b>		
CS4403	Human Computer Interaction	3 + 0
SE3302	Software Project Management	2 + 1
CS4401/	Mobile Computing / Web Engineering	3 + 1
CS4402		
EE4414	Computer Communication & Networks	3 + 1
ME2311	Linear System Modeling	3 + 0
CS3303	Current programming trends	0 + 1

YEAR -2		CR-H
<b>Semester III</b>		
CS3411	Software Engineering	3 + 0
CS2401	Algorithm Analysis and Data Structures	3 + 1
EE1407	Digital Logic Fundamentals	3 + 1
MS1304	Differential Equations & Transforms	3 + 0
EE2403	Fundamentals of Electronics	3 + 1
<b>Semester IV</b>		
CS2403	Database Management System	3 + 1
SE3301	Software Requirement Engineering	3 + 0
EE2408	Computer Architecture and Organization	3 + 1
CS3301	Operating System	3 + 1
MS1302	Linear Algebra	3 + 0

YEAR -4		CR-H
<b>Semester VII</b>		
CS3403 /	Big Data Analytics /	3 + 1
EE4423 /	FPGA /	
EE3416 /	DSP /	
EE3411	LCS	
CS3404	Information Security	
SE2301	Software Construction	2 + 1
SE4301	Software Quality Engineering	2 + 1
CS3402	Compiler Construction	3 + 1
DP4301	SDP-1	0 + 3
<b>Semester VIII</b>		
CS3305 /	Distributed Computing /	3 + 0
CE4314 /	Embedded /	
EE4315 /	DIP /	
EE4322 /	ICA /	
CS3306	Cloud Computing	
CS3401	AI and Expert Systems	3 + 1
MG4302	Technology Entrepreneurship	3 + 0
HS1206	Professional and Social Ethics / Sociology	2 + 0
DP4302	SDP-2	0 + 3