Annual Progress Report 2018-2019

Department of Electronics Engineering



University of Engineering & Technology, Taxila

Vision of the University

To be a quality conscious institution of international standing imparting knowledge in the field of engineering and emerging technologies in a caring environment for the socioeconomic development of the Country.

Mission of the University

To fulfill the needs of the Country by producing responsible graduates equipped with sound knowledge and skills along with highest moral values through conducive, learning environment.

Core Values

Merit Honesty Fair play Teamwork Transparency Implementation of Rule of Law

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CHAPTER 1

ELECTRONIC ENGINEERING DEPARTMENT

The Department of Electronics Engineering started in 2010 with an enrollment of 60 undergraduate students per year. The department is housed in the historic building of laboratory block. Laboratory block is the first building of this campus constructed in 1977. The building is renovated to accommodate Electronics Engineering Department. The department was shifted to 2nd floor of newly purpose built combined academic block beside administration block of UET Taxila in February, 2017. Current enrollment of the program is 40 undergraduate students per year.

The department offers undergraduate and postgraduate programs. In all matters regarding courses of study and others, the department follows the policies and guidelines of Higher Education Commission (HEC) and Pakistan Engineering Council (PEC), Islamabad. The programs are recognized by HEC and PEC.

FACULTY PROFILE

<u>Dean</u>

Engr. Prof. Dr. Tahir Nadeem Malik

<u>Chairman</u>

Dr. Yaseer Arafat Durrani

Associate Professors

Dr. Yaseer Arafat Durrani

BSc. (Uni. of Peshawar) BSc. Engg. (EMU, Turkey) MSc. Engg. (KTH, Sweden) PhD. Engg. (UPM, Spain)

Assistant Professors

Dr. Syed Azhar Ali Zaidi

BSc. Engg. (UET, Taxila) MSc. Engg. (UET, Taxila) PhD. (POLITO, Italy)

Engr. Khawaja Shafiq Haider

BSc Engg (DCET, Karachi) MSc Engg (NUST, Islamabad) Ph.D. Engg. (NUST, Islamabad)

Dr. Aamir Rashid

BSc Engg (UET Lahore) MSc Engg (Uni. of Nice, France) Ph.D. Engg. (INPT, France)

Dr. Usman Masud,

BSc. Engg. (UET, Taxila)MSc. Engg. (Uni. of Kassel, Germany)PhD. Engg. (Uni. of Kassel, Germany)

Lecturers

Adil Usman, BSc Engg (Air Univ, Islamabad) MSc Engg (Air Univ, Islamabad)

Syed Zohaib Hassan Naqvi

BSc Engg (IIUI), MSc Engg (IIUI) MBA (VU)

Muhammad Atif Imtiaz

BSc Engg Engg (MAJU) MSc Engg (UET, Taxila)

Muhammad Faraz (On Higher Studies Abroad)

BSc Engg (IIUI), MSc Engg (UET, Taxila)

Qummar Zaman (On Higher Studies Abroad)

BSc Engg (IIUI) MSc Engg (UET, Taxila)

<u>Lab Engineers</u>

Muhammad Umar Khan BSc. Engg. (COMSATS, Abottabad)

Shujaat Hussain Shah BSc. Engg. (UET, Taxila)

Hafiza Misbah Younis BSc. Engg. (UET, Taxila)

Sumair Aziz BSc. Engg. (IIU, Islamabad)

ACADEMIC PROGRAMS AND ACTIVITIES

1.1 Program Objectives

The academic programs are aimed to meet the following educational objectives:

- To produce graduates capable of developing creative solutions, analysis, and design of Electronics systems with their applications.
- To produce graduates exhibiting leadership with effective contribution towards the uplift of their profession and society through awareness about professional ethics.
- To produce graduates who are willing to pursue continuous professional development for updating and expanding their knowledge base.

1.2 PEC Accreditation

PEC Re-accreditation visit was held on 24-25 May, 2018. PEC accredited 2K14 batch without OBE-based System. PEC accredited 2K15 & 2K16 batch with OBE-based System for Level-II. The Accreditation history of department is given below:

Sr. No.	Session	Status	PEC Notification No.
1	2K10 Session (1 st Session)	Accredited	PEC/AD/UET-T/CL-70/2014 Dated: 24-10-2014
2	2K11 & 2K12 Sessions (2 nd & 3 rd Session)	Accredited	PEC/AD/UET-T/DL-73(EAB)/2015 Dated: 20-08-2015
3	2K13 & 2K14 Sessions (4 th and 5 th Session)	Accredited	PEC/AD/UET-T/DL-83(OBA)/2017 Dated: 08-11-2017
4	2K15 & 2K16 Sessions (6 th and 7 th Session)	Accredited	PEC/AD/UET-T/DL-87(OBA)/2018 Dated: 17-08-2018

BSc Electronic Engineering Program Accreditation Status

1.3 Students Teacher Ratio

The following table lists the student teacher ratio.

Session	Current Strength
2K15	38
2K16	41
2K16	39
2K17	38
Total	156

Full-Time Dedicated Faculty (FTDF)	8
Shared Faulty	2
	(4*0.5=2; 25% of FTDF = 2.25)
TAs/RAs	2
	(9*0.5=4.5; 20% of FTDF = 2)
Student Teacher Ratio	156/(8+2+2)=13

1.4 Undergraduate Program

The Bachelor of Science in Electronics Engineering is a 4-year program. During the 4-year program the students are exposed to the core and elective courses of Electronic engineering, Basic humanities and social sciences, Computer sciences and Management sciences. The students are also required to complete a Final year project with a total of 6 credit hours. Students must complete list of approved courses with total 132-134 credit hours. The lab sessions are designed in order to enhance the concepts studied in the theoretical session and to explore the practical applications of the subject.

Years of study: 4 years

Minimum Number of Credit Hours: 132

Sr. No	Intake Batch	Total Applicants	Total Admission Offered	Total Students Admitted	Present Strength	No. of Sections
1	2K15	4221	45	45	38	1
2	2K16	4371	49	46	41	1
3	2K17	1791	47	46	39	1
4	2K18	4291	38	38	38	1
Tota	ıl		175	171	156	4

1.4.1 Enrollment

1.4.2 Final Year Project

Final Year Project (FYP) in the Department of Electronic Engineering (ENCD) is a two-semester, six (06) credits course. The evaluation of FYP is done through various components such as project proposal, presentations, report and project demo. In 7th semester the student is required to submit the project proposal and also to present his proposal and work in Mid-semester and End-semester presentations. In 8th semester the student required to submit the final project report and has to give an End semester presentation and the Oral examination of the Project. The evaluation of each component is done through rubrics. List of Final Year Projects (FYPs) of 2K14 and 2K15 is given in (Annex-I).

1.4.3 Internship

The Placement Office at UET Taxila search and develop contacts mainly with the national and multinational industries in public as well as in private sectors and R&D organizations with an aim to identify the prospective employers, jobs, scholarships and industrial training for university students. In order to accomplish the goal of University Placement Office, Department of Electronics Engineering has also constituted a Committee to contact with public and private sector companies to generate internship opportunities for its students. The industries in which students completed their internship in 2018 are as follows:

1.4.4 Events Organized by IEEE Consumer Electronic Society (CES)

Following Events/Workshops/Talks are organized by the IEEE-CES of ENCD.

- Development of soft skills
- Engineering Knowledge for Children
- Commercialization of Projects
- Research Methodology
- CES Fiesta

1.4.5 Student Industrial Trips

The following Industrial trips were arranged in 2018:

- Microtech. Ltd., Lahore (2K14, 2K15 Sessions)
- Packages, Lahore (2K14 Session)
- National Institute of Electronics, Islamabad (2K16, 2K17 Sessions)

1.4.6 Student Societies

The proposal for the construction of following two societies are requested to DSA

- Electronic Dept. Literary Society
- Electronic Dept. Sports Society

1.5 Postgraduate Program

The department of Electronics Engineering was established in 2010 to meet the rising demand of quality engineers by the society. Prior to this, the Electrical Engineering department was partially catering for this need by offering Electronics as a specialization in its undergraduate program. Now as its undergraduate program has taken its roots, the Electronics Engineering department has been mandated by the university to start its postgraduate program from 2014. Under this program, the following degrees will be offered:

- Master of Science in Electronics Engineering
- Doctor of Philosophy in Electronics Engineering

1.5.1 Enrollment – 2018

	Applications	Entry Test	Interview	Merit List	Registered
MS-2018	45	36	32	22	12
PhD-Fall-2018	6	3	3	3	2

1.5.2 Post graduate Students Strength

MSc. Program

Session	Enrolled	FT	РТ	Course Work	Thesis	Dropped	Completed
MS-15	15	0	15	0	2	13	0
MS-17	23	15	8	6	14	3	0
MS-18	12	4	8	12	0	0	0

PhD Program

Session	Enrolled	FT	РТ	Course Work	Comprehensive	Thesis
PhD-14	3	0	3	0	1	2
PhD-15	3	0	3	0	1	2
PhD-17	1	0	1	1	0	0
PhD-18	2	0	2	2	0	0

1.5.3 Courses Offered

The courses offered in Spring-2018 and Fall-2018 semesters are listed in Table I to IV.

Table-I Courses Offered in MSc Spring-2018 Semester in Electronic Engineering

S.No.	Course	Course Name	Teacher	Specialization	Core/Elective
1	EN-	Den lan Dramma	Dr. Aamir	Electronic System	Core
1	5002	Random Processes	Rashid	Design	core
2	EN-	Advanced VLSI	Dr. Yaseer	Electronic System	Flective
2	5101	Design	Arafat	Design	Licetive
3	EN-	FPGA – based Design	Dr. Syed	Electronic System	Elective
	5105		Azhar Ali	Design	
4	EN-	Microprocessor-based	Dr. Sajjad	Electronic System	Flective
-	5107	System Design	Hussain	Design	Licenve

Table-II Courses Offered in PhD Spring-2018 Semester in Electronic Engineering

Sr.	Course	Course Name	Teacher Name	Specialization	Core/Elective
No	Code				
1	EN- 6002	Random –Processes&	Dr. Aamir Rashid	Electronic System	Core
	LIN- 0002	statistics (core Course		Design	
2		Special Topics in	Dr. Yaseer Arafat	Electronic System	Elective
	EN- 6310	Electronic System	Durrani	Design	
		Design		Design	

Table-III Courses Offered in MSc Fall-2018 Semester in Electronic Engineering

Sr.	Course	Course Name	Teacher Name	Specialization	Core/El
No.	Code				ective
01	EN-	Mathematical Methods	Dr. Yaseer	All	Core
	5001	for Engineers and	Arafat Durrani		
		Scientists			
02	EN-	Electromagnetic Field	Dr. Aamir	All	Core
	5004	Theory	Rashid		
03	EN-	System-on-Chip Design	Dr. Syed Azhar	Electronic System	Elective
	5104		Ali Zaidi	Design	
04	EN-	Optoelectronic Devices	Dr. Usman	Semiconductor Materials,	Elective
	5204		Masud	Devices and Design	

Table-IV Courses Offered in PhD Fall-2018 Semester in Electronic Engineering

S.No.	Course No.	Course Name	Teacher Name	Specialization	Core/Elective
01	EN-6001	Advance Engineering Mathematics	Dr. Yaseer Arafat Durrani	All	Core Course
02	EN-6003	Numerical Analysis	Dr. Yaseer Arafat Durrani	All	Core Course
03	EN-6306	Optoelectronic Devices	Dr. Usman Masud	All	Elective Course

1.5.4 Meeting of Board of Postgraduate Studies

Sr. No	Meeting No.	Date
01	01	02-08-2018
02	02	11-10-2018

CHAPTER 2

RESEARCH AND DEVELOPMENT

2.1 Overview

The Department of Electronic Engineering was established in 2010 to fulfill the needs of the country by producing responsible graduates equipped with sound knowledge and skills along with highest professional and ethical values through conducive learning environment. The Department offers four years Undergraduate Degree Program leading to BSc. in Electronic Engineering. The Department also offers Postgraduate Degree Program leading to MSc and PhD in Electronic Engineering. The Department is located on the 2nd Floor of newly constructed Combined Academic Block.

Current Enrolment

PhD. Engg9MSc. Engg38BSc. Engg175

Building Area

27,155 sq. ft.

2.2 Laboratories

Lab is an integrated part of most of the theory courses. The laboratories in the Department have state-of-the-art equipment to fulfill the needs of the modern engineering education. The lab sessions are designed to enhance the concepts studied in the theoretical courses, to gain hands-on experience in design and debugging and to explore various practical engineering applications. The Electronic Engineering Department has following state-of-the-art laboratories:

- I. Basic Electronics Lab
- II. Digital Electronics Lab
- III. VLSI Design Lab
- IV. Embedded Systems Lab
- V. Instrumentation and Control Lab

- VI. Digital Signal Processing & Communication Lab
- VII. Computer Simulation Lab
- VIII. Project Lab

2.3 Post Graduate Studies

The Department was mandated by the University to start its postgraduate program in 2014. At present, it has an academic staff of 15, including 10 faculty members, involved in postgraduate teaching and research work. The Department offers both MSc. and PhD. postgraduate programs recognized by the HEC with the following specializations:

- i. Electronics System Design
- ii. Semiconductor Materials, Devices and Design
- iii. Bio-Electronics

The courses contain a balance of professional as well as research aspects and are designed to cater the needs of fresh graduates pursuing career development in both industry and research domains. The faculty of Electronic Engineering Department is highly qualified and holds diverse research interests in the above mentioned areas. In addition to their academic responsibilities, the faculty is actively involved in conducting quality research in their respective areas of investigation.

2.4 Research Facilities and Groups:

Research training is core part of our graduate program. All Postgraduate students are required to complete research thesis culminating in research publication in high-impact factor journals. To facilitate in their research activities, all Postgraduate students are provided with dedicated state-of-the-art computers, highspeed internet access, subscriptions to many quality journal publications as well as full-time access to research labs. At present the department has three main research groups active in the following key areas:

1. Electronics System Design Research Group:

This group is working in areas such as VLSI Design, FPGA-based Design and Mixed signal Design. The following faculty members are part of this research group:

- Dr Yaseer Arafat Durrani
- Dr. Azhar Ali Zaidi
- Engr. Qummar Zaman

2. Electromagnetics and Optics Research Group:

This group is working primarily in areas such as Electromagnetic Field Theory, Laser and Fiber Optics Design and Metamaterials. The following faculty members are part of this research group:

- Dr. Aamir Rashid
- Dr. Usman Masud
- Engr. Muhammad Faraz
- Engr. Syed Zohaib Hassan Naqvi

3. Control & Automation Research Group:

This group is working on analysis and design of Control & Automation related research activities. The following faculty members are part of this research group:

- Dr. Khawaja Shafiq Haider
- Engr. Adil Usman
- Engr. Muhammad Atif Imtiaz

2.5 Publications

The faculty members are actively involved in research. 13 journal papers are published in 2017-18. Details are given in (Annex-II).

2.6 Workshop/ Seminar/Conferences

• Engr. Zohaib Hasan Naqvi participated in international conference in Jordan.

- Dr. Usman Masud participated in international conference in USA.
- Dr. Usman Masud participated in two international Conferences in Pakistan.

CHAPTER 3

FACULTY DEVELOPMENT

3.1 Faculty Development Programs

The faculty members avail different scholarships offered by HEC and International Universities for MS/PhD. Paid leave can be avail by the Faculty member for higher studies after 3 years of service as per University rules.

The following faculty members of the department are on higher studies abroad:

Sr. No	Name	Designation	Country
1	Engr. Muhammad Fraz	Lecturer	Korea
2	Engr. Qummar Zaman	Lecturer	Germany

3.2 Faculty Training for OBE

Faculty members of Electronic Engineering department participated in various seminars and workshops for OBE implementation. Details are listed in the following table.

Agenda	Attendee(s)	Date and Venue
		Electronic
"Training Workshop on OBE/OBA	Dr. Usman Masood	Engineering
System" by Ir. Prof. Azlan bin	Dr. Sajjad Hussain	department, UET
Abdul Aziz, Malaysia	Engr. Adil Usman	Taxila
		6-7 February, 2018
		Electronic
	Faculty members of	Engineering
Training Session on OBE System	Electronic Engineering	department, UET
	department.	Taxila
		1 st February, 2018.

CHAPTER 4

STRENGTH OF INFRASTRUCTURE & NEW INITIATIVES

4.1 Classrooms

Currently there are 6 class rooms and 1 lecture theatre. All classrooms have been upgraded with two white boards, multimedia and other facilities. Request for the up gradation of Lecture Theatre is submitted for the approval.

4.2 Undergraduate Labs

Recently, following 9 state-of-art labs have been established and upgraded:

- Computer Lab-1
- Computer Lab-2
- Basic Electronics Lab
- Digital Electronics Lab
- VLSI Design Lab
- Microprocessor & Microcontroller Lab
- Instrumentation & Control Lab
- DSP & Communication Lab
- Project Lab

New furniture for different labs has been purchased with the amount of Rs.0.6 million.

4.3 Postgraduate Lab

The PC-1 for the postgraduate lab is currently in process.

4.4 Departmental Library

The Departmental Library has been established with 120 books.

4.5 Plantation

The department is decorated with more than 40 plants.

4.6 Upgradation of Computers

There are total 137 computers in the department. Among them 121 computers for students use and 16 for faculty and staff members. Existing computers are upgraded, while core i7 computers have been purchased for the up gradation of different labs.

4.7 BSc. Students Common Room

For girls, separate common rooms is provided for their extra-curricular activities. The request for indoor Table-Tennis and other indoor activities are submitted for approval.

> Dr. Yaseer Arafat Durrani Chairman ENCD

Prof. Dr. Tahir Nadeem Malik Dean FE & EE

ANNEXURE 1

LIST OF FINAL YEAR PROJECTS

ANNEXURE 2

LIST OF PUBLICATIONS