

# Doctor of Philosophy in Electrical Engineering

Program Code	128	Minimum Duration	6 Semesters, 3 Years
Number Of Courses	8 + Dissertation	Maximum Duration	16 Semesters, 8 Years
Credit Hours	48	Minimum CGPA Required To Earn Degree	3.00

## PROGRAM OBJECTIVES:

The objectives of the program are to:

- Enable scholars to engage in advanced study, foster original and scholarly research.
- Integrate professional education and experience towards betterment of humanity.

## ELIGIBILITY :

Candidate having 18 years of education in MS / Masters in Electrical/ Electronics /Computer System Engineering with 3.00 CGPA on the scale of 4.00 in semester system or at least 60% marks in annual system from recognized institute/university are eligible to apply.

Applicant needs to pass GAT (Subject) to be conducted by NTS/ETEA/any Registered Testing Agency or University, with at least 60% cumulative score and to clear departmental interview at the time of admission.

Candidates who have done MS without Research thesis may be considered for admission in the PhD program if they submit a published paper in an HEC recognized journal as a principle author. Other T&Cs of the HEC and Sarhad University will also apply.

## NOTE FOR SCHOLARS:

- Course will be selected from the given list of approved courses in consultation with the Research Advisor.
- The Research Advisor may direct the scholar to register for additional courses related to the area of research.
- Scholar needs to be registered in dissertation of Nine (09) credit hours for each semester for minimum of four (04) semesters.
- Scholar will submit his/her research proposal for approval from BOASAR.
- The scholar shall be required to publish a research paper in an HEC recognized journal before the public defense of the PhD dissertation.
- University Rules and Regulations for Post Graduate Degrees will be applicable.

## SEMESTER 1

Course Code	Course Title	Cr. Hrs. 9
	Elective I	3-0
	Elective II	3-0
	Elective III	3-0
	Elective IV	3-0

## SEMESTER 2

Course Code	Course Title	Cr. Hrs. 9
	Elective V	3-0
	Elective VI	3-0
	Elective VII	3-0
	Elective VIII	3-0

**SEMESTER THREE AND ONWARDS:** RES 900 DISSERTATION 0-9

## PROGRAM OUTCOMES:

- After completion of PhD program in Electrical Engineering the scholars will be able to:
- Apply knowledge of mathematics, science and Electrical Engineering to understand and solve real-life problems,
- Analyze systems and interpret results in the areas of Electrical Power Engineering, Electronic Engineering, Communication Engineering, Computer Systems Engineering and Control Systems,
- Design systems in the areas of Electrical Power Engineering, Electronic Engineering, Communication Engineering, Computer Systems Engineering and Control Systems keeping in view the socio-economic and environmental impact,
- Acquire high professional ethics and be good citizens, and
- Acquire lifelong learning skills to continue to stay on top of advances in the field of Electrical Engineering.

## LIST OF ELECTIVE COURSES

Course Code	Course Title	Cr. Hrs.	Course Code	Course Title	Cr. Hrs.
EE702	Advanced topics in Communication Engineering	3-0	EE769	Advanced Computer Architecture	3-0
EE708	Advanced topics in Electronics Engineering	3-0	EE770	Advanced Embedded Systems	3-0
EE713	Advanced topics in Power Engineering	3-0	EE772	Advanced Digital System Design	3-0
EE719	Advanced topics in Control System Engineering	3-0	EE774	ASIC Design Methodology	3-0
EE727	Advanced topics in Micro and Nanosystems	3-0	EE776	Power Aware Computing	3-0
EE732	Advanced topics in Network systems	3-0	EE721	Advanced Artificial Intelligence	3-0
EE735	MOS VLSI circuit design	3-0	EE780	Advanced Neural Networks	3-0
EE737	Real Time DSP Design and Applications	3-0	EE801	Data Warehousing and Mining	3-0
EE740	Advanced Digital Communications	3-0	EE803	Formal Methods and Specifications	3-0
EE742	Research Methods in PhD Studies	3-0	EE805	Human Aspects in Software Engineering	3-0
EE745	Power Management in wired and wireless systems	3-0	EE807	Advanced Engineering Mathematics	3-0
EE748	Low Power System Design	3-0	EE809	Logic and Research	3-0
EE749	Advanced System Modeling and Simulation	3-0	EE810	Advanced Qualitative Research Methods	3-0
EE751	Special Topics in Distributed Systems	3-0	EE814	Critical Review of Literature	3-0
EE753	Power Awareness in Distributed Systems	3-0	EE816	Agent Based Modeling	3-0
EE759	Power System Stability and Dynamics	3-0	EE820	Bio Medical Image Analysis	3-0
EE760	HVDC and Flexible AC Transmission	3-0	EE824	Optimal Sampled-Data Control Systems	3-0
EE762	Rural Electrification and Distributed Generation	3-0	EE827	Networked Dynamic Systems	3-0
EE765	Artificial Intelligence techniques in Power Systems	3-0	EE829	Modern Control Theory	3-0
EE767	Power System Deregulation	3-0	EE 736	Semiconductor Device Modeling	3-0
			EE 739	Principles of Energy Engineering	3-0
			EE 775	Magnetism, Magnetic Materials & Measurements	3-0
			EE 744	Energy Management in Communication Network	3-0

## LIST OF COURSES

Course Code	Course Title	Cr. Hrs.
XYZ	Plasmonics- Principles and Applications	3-0
XYZ	Software Define Radio	3-0
XYZ	Advance Photonics	3-0
XYZ	Advanced Fiber Optics- Principles and Applications	3-0
XYZ	Computational Analysis in Electromagnetics	3-0
XYZ	Multimodal Biometrics	3-0
XYZ	Advanced Machine Learning	3-0
XYZ	Optical Terahertz Technology	3-0
XYZ	Pattern Analysis	3-0
XYZ	Nano-Biophotonics	3-0
XYZ	Broadband Communication	3-0