

**Semesters 1 - 4 (Common for all Specializations)****Semester I**

SNo	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	MA101	Calculus I	---	(3-0-3)
2	PH103	Physics	---	(3-1-4)
3	EE102	Electric Circuit Analysis	---	(3-1-4)
4	HU118	Islamic Studies	---	(2-0-2)
5	HU101	Communication Skills	---	(3-0-3)
6	HU115	Pakistan Studies	---	(2-0-2)
No of Courses = 6		Credit Hours = 18		Labs = 2

**Semester II**

SNo	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	MA102	Calculus II	MA101	(4-0-4)
2	MA106	Differential Equations	MA101	(3-0-3)
3	EE201	Network Analysis	EE102	(3-1-4)
4	EE205	Semiconductor Devices		(3-0-3)
5	HU104	Technical Writing	---	(3-0-3)
No of Courses = 5		Credit Hours = 17		Labs = 1

**Semester III**

SNo	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	EE211	Electricity and Magnetism	MA101	(3-0-3)
2	CS163	Computer Programming	---	(2-2-4)
3	EE222	Digital Logic Design	---	(3-1-4)
4	EE203	Analog Electronics I	EE102	(3-1-4)
5	MA201	Linear Algebra	---	(3-0-3)
No of Courses = 5		Credit Hours = 18		Labs = 4

**Semester IV**

SNo	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	MA303	Probability and Random Variables	---	(3-0-3)
2	EE216	Electromagnetic Waves	EE211	(3-0-3)
3	EE234	Signals and Systems	MA102	(3-1-4)
4	EE204	Analog Electronics II	EE203	(3-1-4)
5	EE341	Electrical Machines	EE211	(3-1-4)
No of Courses = 5		Credit Hours = 18		Labs = 3

**Total credit hours in common semesters= 71**

**SEMESTERS 5 - 8****Telecommunications****Semester V**

SN	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	EE335	Analog Communications	EE234 & MA 303	(3-1-4)
2	EE313	Antenna and Wave Propagation	EE216	(3-1-4)
3	EE433	Digital Signal Processing	EE234	(3-1-4)
4	EE401	Power Electronics I	EE201 & EE203	(3-1-4)
5	CS162	Object Oriented Programming	CS163	(3-1-4)
No of Courses = 5		Credit Hours = 20		Labs = 5

**Semester VI**

SN	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	EE336	Digital Communication I	EE335	(3-1-4)
2	EE414	Microwave Theory and Techniques	EE216	(3-1-4)
3	EE325	Microprocessors & Microcontrollers I	EE222	(2-1-3)
4	EE354	Control Systems	MA201, MA106	(3-1-4)
5	EE456	Engg Management & Economics	-----	(3-0-3)
No of Courses = 5		Credit Hours = 18		Labs = 4

**Semester VII**

SN	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	EE431	Digital Communication II	EE336	(3-1-4)
2	EE432	Wireless Communications	EE336	(3-0-3)
3	EE435	Information & Coding Theory	EE336	(3-0-3)
4	EE327	Microprocessors & Microcontrollers II	EE325	(2-1-3)
5	EE497	Final Year Project I	-----	(0-3-3)
No of Courses = 5		Credit Hours = 16		Labs = 5

**Semester VIII**

SN	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	EE439	Optical Networks	-----	(3-0-3)
2	EE462	Computer Networks	---	(3-1-4)
3	EE436	Telecomm Networks	---	(3-1-4)
4	EE499	Final Year Project II	-----	(0-3-3)
No of Courses = 4		Credit Hours = 14		Labs = 5

**Total Credits = 71+68=139**

## **SEMESTERS 5 - 8**

### **Electronics**

#### **Semester V**

SNo	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	EE330	Analog & Digital Communication	MA303	(3-1-4)
2	EE303	Digital Electronics	EE222	(3-1-4)
3	EE433	Digital Signal Processing	EE234	(3-1-4)
4	EE456	Engg. Management & Economics	---	(3-0-3)
5	EE305	Analog Electronics III	---	(3-1-4)
No of Courses = 5		Credit Hours = 19		Labs = 4

#### **Semester VI**

SNo	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	EE401	Power Electronics I	EE201 & EE203	(3-1-4)
2	EE325	Microprocessors & Microcontrollers I	EE222	(2-1-3)
3	EE354	Control Systems	MA201, MA106	(3-1-4)
4	CS162	Object Oriented Programming	CS163	(3-1-4)
5	EE403	Industrial Automation	---	(3-1-4)
No of Courses =5		Credit Hours = 19		Labs = 5

#### **Semester VII**

SNo	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	EE324	FPGA Based Design	EE222	(3-1-4)
2	EE402	Power Electronics II	EE401	(3-1-4)
3	EE327	Microprocessors & Microcontrollers II	EE325	(2-1-3)
4	EE497	Final Year Project I	-----	(0-3-3)
No of Courses = 4		Credit Hours = 14		Labs = 6

#### **Semester VIII**

SNo	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	EE405	VLSI Design	EE303	(3-1-4)
2	EE462	Computer Networks	---	(3-1-4)
3	EE313	Antenna and Wave Propagation	EE216	(3-1-4)
4	EE499	Final Year Project II	-----	(0-3-3)
No of Courses = 4		Credit Hours = 15		Labs = 6

**Total Credits = 71+67=138**

**SEMESTERS 5 - 8****Power Engineering****Semester V**

SNo	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	EE401	Power Electronics I	EE201 & EE203	(3-1-4)
2	EE354	Control Systems	MA201, MA106	(3-1-4)
3	EE345	Power Generation Systems	EE341	(3-1-4)
4	EE325	Microprocessors & Microcontrollers I	EE222	(2-1-3)
5	EE403	Industrial Automation	---	(3-1-4)
No of Courses = 5		Credit Hours = 19		Labs =5

**Semester VI**

SNo	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	EE347	Power Distribution & Utilization Systems	EE341	(3-0-3)
2	EE433	Digital Signal Processing	EE234	(3-1-4)
3	EE327	Microprocessors & Microcontrollers II	EE325	(2-1-3)
4	EE305	Analog Electronics III	---	(3-1-4)
5	EE402	Power Electronics II	EE401	(3-1-4)
No of Courses =5		Credit Hours = 18		Labs =4

**Semester VII**

SNo	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	EE441	Power Transmission Systems	EE341	(3-0-3)
2	EE462	Computer Networks	---	(3-1-4)
3	CS162	Object Oriented Programming	CS163	(3-1-4)
4	EE497	Final Year Project I	-----	(0-3-3)
No of Courses = 4		Credit Hours = 14		Labs = 5

**Semester VIII**

SNo	Course Code	Courses	Prerequisites	Credit Hrs (Theory-Lab-Credits)
1	EE442	Power Systems Analysis	EE341	(3-1-4)
2	EE456	Engg Management & Economics	----	(3-0-3)
3	EE330	Analog & Digital Communication	MA303	(3-1-4)
4	EE499	Final Year Project II	-----	(0-3-3)
No of Courses = 4		Credit Hours = 14		Labs = 5

**Total Credits = 71+65=136**

## MS / PhD (EE) Program Details

### Semester I

S.No	Course Code	Courses	Prerequisites	Credit Hrs Theory-Lab-Credits
1	EE651	Linear Systems	---	(3-0-3)
2	EE682	Applied Linear Algebra	---	(3-0-3)
3	EE689	Probabilistic Methods in Electrical Engineering	---	(3-0-3)

**Number of Courses = 3      Credit Hours = 09**

### Semester II

#### **Radar Systems Engineering**

S.No	Course Code	Courses	Prerequisites	Credit Hrs Theory-Lab-Credits
1	EE 611	Electromagnetic Fields	---	(3-0-3)
2	EE 631	Stochastic Processes	MA689	(3-0-3)
3	EE 632	Adaptive Filters	---	(3-0-3)

**Number of Courses = 3      Credit Hours = 09**

#### **Digital Communication Systems**

S.No	Course Code	Courses	Prerequisites	Credit Hrs Theory-Lab-Credits
1	EE 631	Stochastic Processes	MA689	(3-0-3)
2	EE 632	Adaptive Filters	---	(3-0-3)
3	EE 633	Advanced Digital Communications I	EE431	(3-0-3)

**Number of Courses = 3      Credit Hours = 09**

#### **Control Systems**

S.No	Course Code	Courses	Prerequisites	Credit Hrs Theory-Lab-Credits
1	EE 631	Stochastic Processes	MA689	(3-0-3)
2	EE 632	Adaptive Filters	---	(3-0-3)
3	EE 755	Optimal Control	EE651	(3-0-3)

**Number of Courses = 3      Credit Hours = 09**

### Signal and Image Processing Courses

S.No	Course Code	Courses	Prerequisites	Credit Hrs Theory-Lab-Credits
1	EE 631	Stochastic Processes	MA689	(3-0-3)
2	EE 632	Adaptive Filters	---	(3-0-3)
3	EE 671	Digital Image Processing	---	(3-0-3)

**Number of Courses = 3      Credit Hours = 09**

### Semester III

### Radar Systems Engineering, Digital Communication Systems, Control Systems and Digital Signal Processing

S.No	Course Code	Courses	Prerequisites	Credit Hrs Theory-Lab-Credits
1	EE 6XX/7XX	Elective I*	See course list	(3-0-3)
2	EE 6XX/7XX	Elective II*	See course list	(3-0-3)
3	EE 797	MS Thesis	---	(6-0-6)

**Number of Courses = 3      Credit Hours = 12**

### Semester IV

### Continuation of EE797 MS Thesis

\*All the Elective Courses are to be selected from the list of areas of specialization given below

### Elective Courses

SNo	C Code	Radar Systems Engineering Courses	Prerequisites	Cr Hrs
1	EE 611	Electromagnetic Fields	----	3-0-3
2	EE 612	Antennas & Antenna Systems	EE 611	(3-0-3)
3	EE 711	Array Signal Processing	EE 632	(3-0-3)
4	EE 712	Detection and Estimation Theory	EE 631	(3-0-3)
5	EE 713	Radar Engineering	EE 631	(3-0-3)
6	EE 714	Electromagnetic Engineering	EE 611	(3-0-3)
7	EE 715	Computational Methods of Field Theory	EE 714	(3-0-3)
8	EE 811	Advanced Array Signal Processing	EE 711	(3-0-3)

9	EE 812	Advanced Detection and Estimation Theory I	EE 631	(3-0-3)
10	EE 813	Advanced Detection and Estimation Theory II	EE 812	(3-0-3)
11	EE 814	Kalman Filters	EE 631	(3-0-3)
12	EE 819	Special Topics in Radar Systems Engineering	---	(3-0-3)
<b>SNo</b>	<b>C Code</b>	<b>Digital Communication Systems Courses</b>	<b>Prerequisites</b>	<b>Cr Hrs</b>
1	EE 633	Advanced Digital Communications I	---	(3-0-3)
2	EE 634	Advanced Coding Theory	---	(3-0-3)
3	EE 635	Satellite Communications	---	(3-0-3)
4	EE 636	Advanced Mobile Communication	---	(3-0-3)
5	EE637	Lasers and Optical Sources	---	(3-0-3)
6	EE638	Photo detectors	---	(3-0-3)
7	EE 731	Optimization Techniques	---	(3-0-3)
8	EE 732	Advanced Digital Communications II	EE 633	(3-0-3)
9	EE 733	Spread Spectrum Communication Systems	EE 633	(3-0-3)
10	EE 734	Multimedia Communications	EE 633	(3-0-3)
11	EE735	Optical Waveguide Design	-----	(3-0-3)
12	EE 739	Advanced Topics in Digital Communication Systems	-----	(3-0-3)
13	EE 831	Advanced Wireless Techniques	EE 732	(3-0-3)
14	EE 832	Space-Time Coding	EE 634	(3-0-3)
15	EE 833	Adaptive Wireless Transceivers	EE 732	(3-0-3)
16	EE 839	Special Topics in Digital Communication Systems	-----	(3-0-3)
<b>SNo</b>	<b>C Code</b>	<b>Control Systems Courses</b>	<b>Prerequisites</b>	<b>Cr Hrs</b>
1	EE 652	Digital Control Systems	EE 651	(3-0-3)
2	EE 653	System Identification	EE 632	(3-0-3)
3	EE 654	Adaptive Control	EE 632	(3-0-3)
4	EE 655	Real-Time Control	EE 651	(3-0-3)
5	EE 657	Evolutionary Engineering Optimization	---	(3-0-3)
6	EE 752	Advanced Neural Networks	EE 632	(3-0-3)
7	EE 753	Intelligent Control	EE 651	(3-0-3)
8	EE 754	Advanced Robotics and Control	EE 651	(3-0-3)
9	EE 755	Optimal Control	EE 651	(3-0-3)

10	EE 756	Robust Control	EE 651	(3-0-3)
11	EE 759	Special Topics in Intelligent Systems and Control	---	(3-0-3)
12	EE 851	Nonlinear Systems & Control	EE 651	(3-0-3)
13	EE 852	Advanced Process Control	EE 652	(3-0-3)
14	EE 854	Advanced Topics in Nature Inspired Optimization Techniques	EE 657	(3-0-3)
15	EE 855	Advanced Topics in Intelligent Systems and Control	---	(3-0-3)
16	EE 858	Special Topics in Power and Control	---	(3-0-3)
<b>SNo</b>	<b>C Code</b>	<b>Signal and Image Processing Courses</b>	<b>Prerequisites</b>	<b>Cr Hrs</b>
1	EE 671	Digital Image Processing	----	3-0-3
2	EE 771	Pattern Recognition	EE 671	(3-0-3)
3	EE 772	Machine Learning	---	(3-0-3)
4	EE 773	Computer Vision	---	(3-0-3)
5	EE 871	Special Topics in Pattern Recognition	---	(3-0-3)
6	EE872	Special Topics in Signal Image Processing	---	(3-0-3)
<b>SNo</b>	<b>C Code</b>	<b>PhD Dissertation</b>	<b>Prerequisites</b>	<b>Cr Hrs</b>
1	EE899	PhD Dissertation	---	30