Course Structure for Ph. D Program
, Department of Electrical Engineering
National Taiwan Normal University

Adaptive to Class of	Required Credit(s)	Elective Credit(s)	Free Elective Credit(s)	Minimum Total Credits for Graduation
110	4.0	12.0	6.0	22.0

Note: The first alphabet "E" on the course name refers to the course in English as a medium of instruction

I. Required Courses: 4.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
AEC8001	1 E Seminar (I)	1.0	2.0	0.0	This course must be retaken with a passing score for 2 times
AEC8002	2 E Seminar (II)	1.0	2.0	0.0	This course must be retaken with a passing score for 2 times

II. Elective Courses: 0.0 credit is required

III. Courses Offered to Students in Different Divisions

Required Course, 0.0 credit is required

Elective Course: 12.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
AEC8011	1 E Embedded Systems	3.0	3.0	0.0	
AEC8012	2 E Digital Still Camera Design	3.0	3.0	0.0	
AEC8013	3 E Adaptive Control	3.0	3.0	0.0	
AEC8015	4 E Simultaneous Localization and Mapping for Robotics	3.0	3.0	0.0	
AEC8016	5 E Computer Vision	3.0	3.0	0.0	
AEC8017	6 E Intelligent Humanoid Robotics	3.0	3.0	0.0	
AEC8018	7 E Machine Learning	3.0	3.0	0.0	
AEC8019	8 E Video Communication	3.0	3.0	0.0	
AEC8020	9 E Pattern Recognition	3.0	3.0	0.0	
AEC8021	10 E Stochastic Processes	3.0	3.0	0.0	
AEC8023	11 E Computer Simulations of Communications Systems	3.0	3.0	0.0	
AEC8004	12 E Digital Control Systems	3.0	3.0	0.0	
AEC8025	13 E Engineering Probability and Statistics	3.0	3.0	0.0	
AEC8045	14 E MIMO Communication Transceiver Design and Implementation	3.0	3.0	0.0	
AEC8047	15 E VLSI Design	3.0	3.0	0.0	
AEC8058	16 E Deep Learning	3.0	3.0	0.0	
AEC8059	17 E Reinforcement Learning	3.0	3.0	0.0	
AEC8060	18 E Robot Vision	3.0	3.0	0.0	
AEC8057	19 E Evolutionary Computation	3.0	3.0	0.0	
AEC8038	20 E Robotic Control	3.0	3.0	0.0	
AEC8041	21 E IC and ESD Protection Design	3.0	3.0	0.0	

IV. Free Elective Credits: 6.0 credits are required