RUTGERS
School of Engineering

Department of Electrical and Computer Engineering
Rutgers, The State University of New Jersey · 94 Brett Road · Piscataway, NJ 08854-8058
(732) 445-3262/3127 · FAX: (732) 445-2820

Educational Objectives, Outcomes, and Assessment Process

1. Degree Title

Bachelor of Science in Electrical and Computer Engineering (BSECE)

2. Program Educational Objectives

Consistent with the stated mission of the University, the *mission* of the electrical and computer engineering program is to prepare its graduates for a rapidly changing technological field. The faculty of the department of Electrical and Computer Engineering strives to educate and train the students in a technically sound and challenging manner in order to achieve the following *educational objectives*:

1. To prepare graduates to pursue professional careers or continue their education in graduate programs.

2. To ensure that graduates are proficient and competent in at least one of the following electrical and computer engineering areas: communications, computer engineering, digital signal processing, systems and controls, and solid state electronics.

3. To produce graduates who will pursue life-long learning and professional development.

3. Educational Outcomes

Rutgers ECE graduates should have attained:

(a) an ability to apply knowledge of mathematics, science, and engineering

(b) an ability to design and conduct experiments, as well as to analyze and interpret data

(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

(d) an ability to function on multi-disciplinary teams

(e) an ability to identify, formulate, and solve electrical and computer engineering problems

(f) an understanding of professional and ethical responsibility

(g) an ability to communicate effectively

(h) the broad education necessary to understand the impact of electrical and computer engineering solutions in a global,economic, environmental, and societal context

(i) a recognition of the need for, and an ability to engage in life-long learning

(j) a knowledge of contemporary issues

(k) an ability to use the techniques, skills, and modern engineering tools necessary for electrical and computer engineering practice.

4. **The Relationship Between Educational Objectives and Outcome**

Relationship between Educational Objectives and Outcomes
(Dark = Highly Related, Gray = Supportive, White = None)

Objective / Outcome	(1) To prepare graduates to pursue professional careers or continue their education in graduate programs.	(2) To ensure that graduates are proficient and competent in at least one of the following electrical and computer engineering areas: communications, computer engineering, digital signal processing, systems and control, and solid state electronics.	(3) To produce graduates who will pursue life-long learning and professional development.
(a) Ability to apply knowledge of math, science and engineering.			
(b) Ability to design and conduct experiments, analyze and interpret data.			
(c) Ability to design a system, component, or process to meet desired needs within realistic constraints.			
(d) Ability to function in multidisciplinary teams.			
(e) Ability to identify, formulate, and solve electrical and computer engineering problems.			
(f) Understanding of professional and ethical responsibility.			
(g) Ability to communicate effectively.			
(h) Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.			
(i) Recognition of need for and an ability to engage in life-long learning			
(j) Knowledge of contemporary issues.			
(k) Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.			

Course VS Course Outcomes

N = none S = Supportive H = highly related

	COURSE OUTCOMES											OTHERS					
Course	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5	6
221 Principles Of EE I	H	N	N	N	H	N	N	N	S	N	H	H	S	N	N	S	S
222 Principles Of EE II	H	S	N	N	H	N	S	N	S	N	H	H	N	S	N	S	S
223 Principles Of EE I Lab	H	H	S	H	S	N	H	N	S	N	H	H	S	N	N	H	S
224 Principles Of EE II Lab	H	H	S	H	S	N	H	N	S	N	H	H	S	S	N	H	S
226 Probability & Stochastic Processes	H	S	H	N	H	N	S	N	S	N	H	H	S	H	S	S	S
231 Digital Logic Design	H	H	S	N	H	S	S	N	S	N	H	S	S	H	H	H	S
233 Digital Logic Design Lab	H	H	H	H	H	S	H	N	S	N	H	S	S	H	H	H	S
252 Programming Methodology I	H	N	N	N	H	N	S	N	S	N	H	N	N	H	S	H	S
254 Programming Methodology II Lab	H	H	S	N	S	S	S	N	S	N	H	N	N	H	S	H	S
322 Principles of Comm. Systems	H	N	S	N	H	N	S	S	S	N	H	H	S	N	N	N	S
331 Computer Architecture	H	S	N	N	H	N	S	N	S	N	H	H	S	H	H	S	S
333 Computer Architecture Lab	H	H	N	S	H	N	S	N	S	N	H	H	S	H	H	H	N
345 Linear Systems & Signals	H	N	S	N	H	N	H	N	S	N	H	H	H	S	N	S	S
346 Digital Signal Processing	H	S	S	N	H	N	S	N	S	N	H	H	S	H	S	H	S
347 Linear Systems & Signals Lab	H	H	S	N	S	S	H	N	S	N	H	H	S	S	N	H	S
348 Digital Signal Processing Lab	H	S	S	N	H	N	S	N	S	N	H	H	S	H	S	H	S
351 Programming Methodology II	H	N	N	N	H	N	S	N	S	N	H	N	N	H	S	H	S
361 Electronic Devices	H	S	N	N	H	N	S	N	S	N	H	H	S	S	N	S	S
363 Electronic Devices Lab	H	H	S	S	S	S	H	N	S	N	H	H	S	S	N	H	S
366 Analog Electronics	H	S	N	N	H	N	S	N	S	N	H	H	S	H	S	S	S
368 Analog Electronics Lab	H	H	S	S	S	S	H	N	S	N	H	H	S	H	S	H	S
373 Elements of EE	H	N	N	N	S	N	N	N	S	N	S	S	S	N	N	S	S
375 Elements of EE Lab	H	S	S	H	S	N	H	N	S	N	H	S	S	N	N	H	S
382 Electromagnetic Fields	H	N	N	N	H	S	S	S	S	S	H	H	S	N	N	S	S
411 Energy Conversion	H	S	N	N	H	N	S	N	S	N	H	H	S	N	N	S	S
415 Automatic Control Systems	H	N	S	N	H	N	H	N	S	N	H	H	H	S	N	S	S
417 Control System Design	H	N	S	N	H	N	H	N	S	N	H	H	H	H	N	S	S
418 Capstone Design - Systems & DSP	H	H	H	H	H	S	H	S	S	S	H	H	H	N	N	H	S
421 Wireless Communications	H	H	H	H	H	H	H	S	S	S	H	H	S	N	N	N	S
423 Computer & Comm. Networks	H	H	N	S	H	N	S	N	S	N	H	H	S	H	S	S	S
424 Info & Network Security	H	S	S	S	H	N	H	N	S	S	S	H	S	H	S	H	S
427 Communication System Design	H	H	S	S	H	S	H	N	S	N	H	H	S	N	N	H	S
428 Capstone Design - Comm. Systems	H	H	H	H	H	S	H	S	H	S	H	H	H	S	N	H	S
437 Digital System Design	H	S	N	N	H	N	S	N	S	N	H	S	S	H	H	S	S
438 Capstone Design - Comp. Systems	H	H	H	H	H	S	H	S	S	S	H	N	N	H	H	H	S
447 Digital Signal Processing Design	S	H	H	H	H	H	H	H	S	H	H	H	H	S	S	S	S
451 Parallel & Distributed Programming	H	H	S	H	H	N	S	N	S	N	H	N	N	H	H	S	S
452 Software Engineering	H	H	H	H	H	S	H	S	S	S	H	N	N	H	H	H	S
456 Network Centric Programming	H	S	N	N	H	N	S	N	S	S	H	N	S	H	H	H	S
460 Power Electronics	H	H	S	S	H	S	S	N	S	N	H	H	S	N	N	S	S
461 Pulse Circuits	H	S	N	S	H	N	S	N	S	N	H	H	S	S	N	S	S
463 Analog Electronics	H	N	N	N	H	N	S	N	S	N	H	H	H	N	N	H	S
465 Physical Electronics	H	S	N	N	H	N	S	N	S	N	H	H	S	N	N	N	S
466 Optoelectronics	H	S	H	N	H	S	S	S	S	S	H	H	S	N	N	S	S
467 Microelectronic Processing	H	H	S	S	H	S	H	N	S	N	H	H	S	N	S	H	S
468 Capstone Design - Electronics	H	H	H	H	H	S	H	S	S	S	H	H	H	N	N	H	S
472 Robotics & Computer Vision	H	S	H	H	H	N	S	N	S	N	H	H	S	S	H	S	S
474 Computer Graphics	H	S	S	N	H	N	S	N	S	N	H	S	S	S	H	S	S
476 Virtual Reality	H	S	S	N	H	N	S	S	S	N	H	S	S	S	N	S	S
478 Virtual Reality Lab	H	S	N	H	H	N	S	S	S	N	H	H	S	S	S	H	S
479 VLSI Design	H	H	N	N	H	N	S	N	H	N	H	H	H	H	H	H	S
481 EM Waves	H	S	H	N	H	S	S	S	S	S	H	H	S	N	N	S	S
482 Deep Submicron VLSI Design	H	H	N	N	H	N	S	N	H	N	H	H	H	H	H	H	S
491-492 SPL Probs/Independent Res.	H	H	N	N	H	S	H	S	S	S	H						
496-497 Co-Op Internship in ECE	H	H	H	H	H	H	H	S	S	S	H						

Outcomes
(a) an ability to apply knowledge of Mathematics, science, and engineering
(b) an ability to design and conduct experiments and interpret data
(c) an ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(d) an ability to function as part of a multi-disciplinary team
(e) an ability to identify, formulate, and solve ECE problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate in written and oral form
(h) the broad education necessary to understand the impact of electrical and computer engineering solutions in a global, economic, environmental, and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for electrical and computer engineering practice
Others
1. Basic disciplines in Electrical Engineering
2. Depth in Electrical Engineering
3. Basic disciplines in Computer Engineering
4. Depth in Computer Engineering
5. Laboratory equipment and software tools
6. Variety of instruction formats