ABET Review: Communications Spring 2022



Course Offerings & Enrollments

Class	Title	Au'18	Wi'19	Spr'19	Aut'19	Wi'20	Spr'20	Au'20	Wi'21	Spr'21	Au'21	Wi'22	Spr'22
416	Random Signals for Communications & Signal Processing (4)	26			35			34			37		
417	Modern Wireless Communications (4)		13			11			13			11*	
418	Network Security & Cryptography (3)	33			31			34			38		
419	Intro to Computer- Communication Networks (4)			29			29			39			19
420	Design in Communications (4)			8			7**			3			-

* EE 417 and EE 506 were combined in Winter 2022, four of eleven students are from EE 506.



** EE 420 and EE 507 were combined in Spring 2020; two of seven students are from EE 507.

ABET End of Course Compliance – Missing Reports

Spring 2020

• EE 419 - Introduction to Computer-Communication Networks (Sumit Roy)



ABET Outcomes

Novice/Developing/Competent/Exemplary

Course	Offering	Faculty	Q1	Q2	Q3	Q4	Q5	Q6	Q7
416	Au'20	J. Ritcey	no	EOC					
	Au'21	J. Ritcey	0/0/4/2					0/0/4/2	
417	Wi'20	J. Rosenthal	no	ABET	detail	assign.	for	this	offering
	Wi'21	J. Rosenthal	no	ABET	detail	assign.	for	this	offering
	Wi'22	J. Ritcey	0/2/0/2						
418	Au'20	R. Poovendran	0/1/3/2			0/0/0/6			0/0/4/3
	Au'21	R. Poovendran	0/1/2/3			0/0/0/6			0/1/2/3
419	Spr'20	S. Roy	no	EOC					
	Spr'21	S. Kannan	0/1/3/2					0/1/3/2	
420	Spr'19	P. Arabshahi	1/0/0/2		1/0/0/2		not		1/0/0/2
							assessed		
	Spr'21	P. Arabshahi	no	ABET	detail	assign.	for	this	offering



Solve Problems. 2: Apply Design Considering Constraints. 3: Communication.
Ethics. 5: Teams. 6: Experiment & Analyze Data. 7: Learning

Engineering Standards

EE 420 no longer offered – capstone has moved to ENGINE. A future EE 420 will likely be a joint grad/undergrad course on software defined radio; has to be renamed to be more in line with this topic as well.

- EE 420 Spr' 21: not assigned/assessed.
- EE 420 Spr'20: 1.5 pages in one report, discussing Bluetooth, Bluetooth Low Energy, USB, and constraints; ½ a page in another report, discussing VGA, MPEG-2, USB, and including discussion of constraints and regulatory compliance.
- EE 420 Spr'19: ½ a page in one report, discussing 802.11ac and USB 3.0; ½ a page in another report, discussing Ethernet and USB.



Major Updates

- **EE 418**: Increased credits from 3 to 4 and significantly updated course content for Autumn 2022.
- Currently introducing two new courses (**EE 465**, ML for Cyber, and **EE 467**, Network and Web Security, and renaming/focusing EE 418 on Crypto)
- Strong new pathway in Cybersecurity with three new courses, and EE 468 new course on embedded security
- New course on Probability for Information and Communication Engineering (EE 391) to cover probabilistic concepts for ECE majors with applications to information/data science, signal processing, and communication systems. Includes accompanying Python labs
- Addition of GNU Radio simulation experiments to EE 417



Challenges

- **EE 420**: Checking student work (code, simulations, hardware), providing live advice, and sitting through live experiment iterations over Zoom is difficult. We managed this with a lot more student engagement outside class, or via email.
- **EE 417**: Many students (~1/3) lacked experience in linear systems theory (e.g. convolution).
- **EE 417**: A majority of students seemed to lack an understanding of how the theoretical elements we teach them apply to real-world engineering problems. They really seem to crave opportunities to apply these skills to real hardware problems. Several students expressed how the theory-heavy prerequisites (EE 416 and the first half of EE 417) for wireless communications have made them consider different focus areas. My recommendation is to at least consider how we can give students hardware experience with wireless systems (perhaps starting in EE 371 with off-the-shelf prepackaged modules?). I believe doing so would spark the students' curiosity and give them better context for why the theory in EE 416 and EE 417 is relevant and important.
- **EE 416**: Attendance varied, due to Covid. Student prep has dropped since Covid. Basic math, basic signals and systems, and programming are all lacking.

ELECTRICAL & COMPUTER ENGINEERING