Computer Engineering Areas of Study and Area Courses

1. ASR – Autonomous Systems & Robotics
2. CN – Communications and Networks
3. DDSS – Distributed, Dependable, Secure Systems
4. MSP – Multimedia and Signal Processing
5. VAES – VLSI, Architecture & Embedded Systems

Course Descriptions

For course descriptions please see the course catalog: https://webapp4.asu.edu/catalog/

Course & Prefix	Course Title (Credit Hours)	ASR	CN	DDSS	MSP	VAES
BMI/BME 507	Intro Image Processing and Analysis (3) **Note that this class would count as a CEN prefix course**				X	
CEN 503	Algorithms for Computer-Aided Design of Digital Systems in VAES (3)					X
CEN 571	Hardware Acceleration and FPGA Computing (3)					X
CEN 598/BMI 598	Embedded Machine Learning (3)					X
CEN 598	Hardware Acceleration and FPGA Computing (3)					X
CEN 598/CSE 598	Hardware Security & Trust (3)			X		X
CEN 598	Machine Learning Accelerator Design (3)					X
CEN 598/CSE 598	Reconfigurable Computing (3)					X
CEN 598/EEE 598	VLSI Design Automation (3)					X
CEN 691	Digital Logic Synthesis & Verification Algorithms (3) Approved under these numbers and course titles: CEN 691: Algorithms for Computer-Aided Design of VLSI Systems (Fall 2016) CEN 598: Algorithms for Synthesis and Optimization of Digital Systems (Fall 2015) CSE 591: Digital Logic Synthesis and Verification Algorithms (Fall 2005, Fall 2006, Fall 2007, Fall 2009, Spring 2012)					X
CSE 509	Digital Video Processing (3)				X	
CSE 511	Data Processing at Scale *This course is an anti-requisite to CSE 512. You cannot take both CSE 511 and CSE 512*			X		

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Course & Prefix	Course Title (Credit Hours)	ASR	CN	DDSS	MSP	VAES
CSE 512	Distributed Database Systems (3) *This course is an anti-requisite to CSE 511. You cannot take both CSE 511 and CSE 512*			X		
CSE 515	Multimedia Web Databases (3)				X	
CSE 520	Computer Architecture II (3)					X
CSE 522	Real Time Embedded Systems (3)					X
CSE 530	Embedded Operating Systems Internals (3)					X
CSE 531	Distributed & Multiprocessor Operating Systems (3)			X		
CSE 534	Advanced Computer Networks (3)		X			
CSE 535	Mobile Computing (3)					X
CSE 536	Advanced Operating Systems (3)			X		
CSE 539	Applied Cryptography (3)			X		
CSE 543	Information Assurance and Security (3)			X		
CSE 545	Software Security (3)			X		
CSE 546	Cloud Computing (3)			X		
CSE 548	Advanced Computer Network Security (3)		X	X		
CSE 569	Fundamentals of Statistical Learning and Pattern Recognition (3)	X			X	
CSE 550	Combinatorial algorithms and intractability (3)			X		
CSE 552	Randomized and Approximation Algorithms (3)			X		
CSE 570	Advanced Computer Graphics (3)				X	
CSE 571	Artificial Intelligence (3) NOTE- CSE 471 is an antirequsite to this class. All graduate CEN students should register for CSE 571 if they are interested in this topic.	X				
CSE 572	Data Mining (3)	X				
CSE 573	Semantic Web Mining				X	
CSE 574	Planning and Learning Methods in AI (3)	X				

Course & Prefix	Course Title (Credit Hours)	ASR	CN	DDSS	MSP	VAES
CSE 575	Statistical Machine Learning (3)	X				
CSE 576	Natural Language Processing (3)	X				
CSE 579	Knowledge Representation (3)			X	X	
CSE 591	Perception in Robotics (3)	X				
CSE 598	Introduction to Deep Learning in Visual Computing (3)	X			X	
CSE 598	Theoretical Foundations of Cyber-Physical Systems (3) Approved under these numbers and course titles: CSE 591 Theoretical Foundations of Cyber-Physical Systems; CSE 591 Cyber-Physical Systems: Modeling, Verification and Synthesis; CSE 591 Cyber-Physical Systems	X				
EEE 505	Time-Frequency Signal Processing (3)				X	
EEE 506	Digital Spectral Analysis (3)				X	
EEE 507	Multidimensional Signal Processing (3)				X	
EEE 508	Digital Image and Video Processing and Compression (4)				X	
EEE 511	Artificial Neural Computation (3)	X				
EEE 515	Machine Vision and pattern recognition (3)				X	
EEE 516	Physics-Based Computer Vision (3) Previously EEE 598 Computational Cameras, Lighting, and Displays				X	
EEE 523	Advanced Analog Integrated Circuits (4)					X
EEE 518	Fundamentals of Semiconductor and Packaging (3)					X
EEE 525	VLSI Design (4)					X
EEE 526	VLSI Architectures (3)					X
EEE 527	Analog to Digital Converters (4)					X
EEE 529	Semiconductor Memory Tech & Sys (3)					X
EEE 530	Advanced Silicon Processing (3)					X
EEE 531	Semiconductor Device Theory (3)					X

Course & Prefix	Course Title (Credit Hours)	ASR	CN	DDSS	MSP	VAES
EEE 549/598	Statistical Machine Learning: From Theory to Practice (3)	X			X	
EEE 551	Information Theory (3)		X			
EEE 552	Digital Communications (3)		X			
EEE 553	Coding and Cryptography (3)			X		
EEE 556	Detection and Estimation Theory (3)				X	
EEE 557	Broadband Networks (3)		X			
EEE 558	Wireless Communications (3)		X			
EEE 559	Wireless Networks (3)		X			
EEE 560	Mathematical Foundations of Machine Learning (3) Previously titled: EEE 598 Machine Learning from Theory to Algorithms	X			X	
EEE 581	Filtering Stochastic Processes	X	X	X		
EEE 582	Linear System Theory (3)	X				
EEE 585	Security and Privacy Network Systems (3)		X	X		
EEE 586	Nonlinear Control Systems (3)	X				
EEE 587	Optimal Control (3)	X				
EEE 588	Design of Multivariable Control Systems (3)	X				
EEE 589	Linear Algebra and Convex Optimization (3)				X	
EEE 598	Advanced Hardware Systems for Machine Learning (3)					X
EEE 598	Computational Image Understanding (3)	X			X	
EEE 598	Constructionist approach to microprocessor design (4)					X
EEE 598	Distributed and Large Scale Optimization (3)	X		X		
EEE 598	Deep Learning for Media Processing (4)				X	
EEE 598	Game Theory: Models, Algorithms and Applications (3)	X	X	X		
EEE 598	Intro to Complex Networks (3)		X	X		

Course & Prefix	Course Title (Credit Hours)	ASR	CN	DDSS	MSP	VAES
EEE 598	Introduction to Electric and Autonomous Vehicles (3)	X				X
EEE 598	Introduction to Quantum Information and Quantum Computing (3)					X
EEE 598	Machine Learning (3)	X			X	
EEE 598	Mobile Systems Architecture (3)					X
EEE 598	Neuromorphic Computing Hardware Design (3)	X				X
EEE 598	Personal Sensors for Mobile Health (3)					X
EEE 598	Reinforcement Learning in Robotics (3)	X				
EEE 598	Remote Sensing and Synthetic Aperture Imaging (3)				X	
EEE 598	RF Transmitters and Amplifiers (3)		X			X
EEE 598	Semiconductor Heterogeneous Integration (3)					X
EEE 598	Speech and Audio Processing and Perception (3)				X	
EEE 598	System-Level Design for Multicore Architectures (3)					X
EEE 598	VLSI Modulation Circuits (4)					X
EEE 606	Adaptive Signal Processing (3)				X	
EEE 607	Speech Coding for Multimedia Communications (3)				X	
EEE 625	Advanced VLSI Design (4)					X
EEE 686	Adaptive Control (3)	X				
IEE 598	Modern Temporal Learning (3)	X			X	