

Northwestern McCORMICK SCHOOL OF ENGINEERING

Computer Science

Academics

Course Listings

Please view the following document with last year's courses:

[2020-21 Course Listing](#)

[2021-22 Course Listing](#)

As of Fall 2019, EECS have been separated into two departments - ECE & CS. Here is the [ECE Course Listing](https://www.mccormick.northwestern.edu/electrical-computer/courses/) (<https://www.mccormick.northwestern.edu/electrical-computer/courses/>) or [CAESAR catalogue](https://caesar.northwestern.edu/) (<https://caesar.northwestern.edu/>).

To request permission number email - [CS course Permission](mailto:CS-Permissions_Advising@northwestern.edu) (mailto:CS-Permissions_Advising@northwestern.edu) or [ECE course Permission](#). (<mailto:eecspermissions@northwestern.edu>)

FILTER BY

SEARCH

Course	Course Title	Fall 2022	Winter 2023	Spring 2023	Summer 2023
COMP_SCI 101 (descriptions/101.html)	Computer Science: Concepts, Philosophy, and Connections (descriptions/101.html)				
COMP_SCI 110 (descriptions/110.html)	Intro to Computer Programming (descriptions/110.html)	10-10:50 MWF Horn	10-10:50 MWF Bain	10-10:50 MWF (Bain) or 9:30-10:50 TuTh (Kuzmanovic)	10-11:20 MW Mamakos
COMP_SCI 111 (descriptions/111.html)	Fundamentals of Computer Programming I (descriptions/111.html)	1-1:50 or 2-2:50 MWF Bain	11-11:50 MWF Sood	1-1:50 MWF Sood	
COMP_SCI 150 (descriptions/150.html)	Fundamentals of Computer Programming 1.5 (descriptions/150.html)	12-12:50 MWF Compton	1-1:50 MWF Compton	11-11:50 MWF Compton	
COMP_ENG 203 (descriptions/203.html)	Intro to Computer Engineering (descriptions/203.html)	MTuWF 11-11:50 Joseph		MTuWF 11-11:50 Zhou	
COMP_ENG 205 (descriptions/205.html)	Fundamentals of Computer System Software (descriptions/205.html)		MTWF 2:00-2:50 Joseph		
COMP_SCI 211 (descriptions/211.html)	Fundamentals of Computer Programming II (descriptions/211.html)	12:30-1:50 TuTh Bhagavatula & Hummel	9:30-10:50 or 2-3:20 TuTh Hummel	2-3:20 TuTh Ghena	

Course	Course Title	Fall 2022	Winter 2023	Spring 2023	Summer 2023
COMP_SCI 212 (descriptions/212.html)	Mathematical Foundations of Computer Science (descriptions/212.html)	3-3:50 MWF Vijayaraghavan & Evert	3-3:50 MWF Evert	9:30-10:50 TuTh Wang	
COMP_SCI 213 (descriptions/213-20.html)	Intro to Computer Systems (descriptions/213-20.html)	2-3:20 TuTh Dinda	12:30-1:50 MW Ghena	2-3:20 TuTh Hardavellas	
COMP_SCI 214 (descriptions/214.html)	Data Structures and Algorithms (descriptions/214.html)	11:00-12:20 TuTh St-Amour	11:00-12:20 TuTh St-Amour	11:00-12:20 TuTh Bhagavatula	Async:Remote (Optional office hours TuTh 3:30 – 4:50) Rasmussen
COMP_SCI 217 (descriptions/217.html)	Data Management and Information Processing (descriptions/217.html)	9:30-10:50 TuTh Hummel	12:30-1:50 TuTh Hu	9:30-10:50 TuTh Hu	
COMP_SCI 260, 460 (descriptions/260-460.html)	Introduction to Law and Digital Technologies (descriptions/260-460.html)			2:00-3:20 M Linna & Villasenor (Lab: 3:30-4:50 M (Discussion))	
COMP_SCI 301 (descriptions/301.html)	Introduction to Robotics Laboratory (descriptions/301.html)		12:30-3:20 TuTh Argall		
COMP_ENG 303 (descriptions/303.html)	Advanced Digital Design (descriptions/303.html)	TuTh 12:30-1:50 Gu		TuTh 3:30-4:50 S. Memik	
COMP_SCI 310 (descriptions/310.html)	Scalable Software Architectures (descriptions/310.html)			2-3:20 TuTh Hummel	
COMP_SCI 312, 412 (descriptions/312-412.html)	Data Privacy (descriptions/312-412.html)	3:30-4:50 TuTh Bhagavatula	11-12:20 TuTh Bhagavatula		
COMP_SCI 313, 413 (descriptions/313-413.html)	Tangible Interaction Design and Learning (descriptions/313-413.html)			3:30-4:50 MW Horn	
COMP_SCI 314 (descriptions/314.html)	Technology & Human Interaction (descriptions/314.html)		9:30-10:50 TuTh Gergle		
COMP_SCI 315, 415 (descriptions/315-415.html)	Design, Technology, and Research (descriptions/315-415.html)	12-3 F Zhang	12-3 F Zhang	12-3 F Zhang	
COMP_SCI 321 (descriptions/321.html)	Programming Languages (descriptions/321.html)	3:30-4:50 TuTh St-Amour	3:30-4:50 TuTh Dimoulas	12:30-1:50 TuTh St-Amour	2-3:20 TuTh Lazarek
COMP_SCI 322 (descriptions/322.html)	Compiler Construction (descriptions/322.html)		5 -6:20 TuTh Campanoni		

Course	Course Title	Fall 2022	Winter 2023	Spring 2023	Summer 2023
COMP_SCI 323 (descriptions/323.html)	Code Analysis and Transformation (descriptions/323.html)	5-6:20 TuTh Campanoni			
COMP_SCI 325 (descriptions/325.html)	Artificial Intelligence Programming (descriptions/325.html)	11-11:50 MWF Riesbeck			
COMP_SCI 329 (descriptions/329.html)	HCI Studio (descriptions/329.html)		9:30-10:50 MW Jacobs	11-12:20 MW Zhang	
COMP_SCI 330 (descriptions/330-1.html)	Human Computer Interaction (descriptions/330-1.html)	11:00-11:50 MWF Worsley			10-11:20 TuTh Chávez
COMP_SCI 332 (descriptions/332.html)	Online Markets (descriptions/332.html)		3:30-4:50 MW Hartline		
COMP_SCI 333 (descriptions/333.html)	Interactive Information Visualization (descriptions/333.html)	3:30-4:50 TuTh Kay			
ELEC_ENG/COMP_ENG 334 (descriptions/334.html)	Fundamentals of Blockchains and Decentralization (descriptions/334.html)		MW 2-3:20 Guo		
COMP_SCI 335 (descriptions/335.html)	Intro to the Theory of Computation (descriptions/335.html)	5-6:20 TuTh Dong			
COMP_SCI 336 (descriptions/336.html)	Design & Analysis of Algorithms (descriptions/336.html)	11-12:20 TuTh & 5-6:20 MW Makarychev	9:30-10:50 TuTh Stull	3:30-4:50 TuTh Stull	
COMP_SCI 337 (descriptions/337.html)	Intro to Natural Language Processing (descriptions/337.html)		3:30-4:50 MW Birnbaum		
COMP_SCI 338 (descriptions/338-1.html)	Practicum in Intelligent Information Systems (descriptions/338-1.html)	11-12:20 TuTh Hammond		11-12:20 TuTh Hammond	
COMP_SCI 338 (descriptions/338-2.html)	Practicum in Intelligent Information Systems (descriptions/338-2.html)			1-3:50 M Birnbaum	
COMP_SCI 339 (descriptions/339.html)	Intro to Databases (descriptions/339.html)		11-12:20 TuTh Rogers	9:30-10:50 TuTh (Rogers) or 2-3:20 (Crotty)	
COMP_SCI 340 (descriptions/340.html)	Introduction to Computer Networking (descriptions/340.html)	9:30-10:50 TuTh Carisimo	12:30-1:50 TuTh Kuzmanovic		

Course	Course Title	Fall 2022	Winter 2023	Spring 2023	Summer 2023
COMP_SCI 343 (descriptions/343.html)	Operating Systems (descriptions/343.html)	12:30-1:50 TuTh Ghena	9:30-10:50 MW Dinda		
COMP_SCI 344 (descriptions/344.html)	Design of Problem Solvers (descriptions/344.html)		2-3:20 TuTh Forbus		
COMP_SCI 345 (descriptions/345.html)	Distributed Systems (descriptions/345.html)				
COMP_ENG 346 (descriptions/346.html)	Microprocessor System Design (descriptions/346.html)	TuTh 3:30-4:50 Ghena (Lab: F 10:00-11:50 OR F 1:00-2:50)			
COMP_SCI 347, 447 (descriptions/347-447.html)	Conversational AI (descriptions/347-447.html)				
COMP_SCI 348 (descriptions/348.html)	Intro to Artificial Intelligence (descriptions/348.html)	12:30-1:50 TuTh Hammond		9:30-10:50 TuTh Rubenstein	9:00-10:30 MW (Sync: Class meets remotely) Alam
COMP_SCI 349 (descriptions/349.html)	Machine Learning (descriptions/349.html)	8 - 9:20 or 11 - 12:20 MW Wood-Doughty	12:30-1:50 TuTh Wood-Doughty	9:30-10:50 MW Subrahmanian	9:00-10:30 TuTh (Sync: Class meets remotely) Alam
COMP_SCI 350 (descriptions/350.html)	Introduction to Computer Security (descriptions/350.html)	2-3:20 TuTh Xing			
COMP_SCI 351-1 (descriptions/351-1.html)	Intro to Computer Graphics (descriptions/351-1.html)	9-9:50 MWF Tumblin			
COMP_SCI 351-2 (descriptions/351-2.html)	Intermediate Computer Graphics (descriptions/351-2.html)		1-1:50 MWF Tumblin		
COMP_SCI 354 (descriptions/354.html)	Computer System Security (descriptions/354.html)		3:30-4:50 MW Chen		
COMP_SCI 355 (descriptions/355.html)	Digital Forensics and Incident Response (descriptions/355.html)			3:30-4:50 MW Chen	
COMP_ENG 361 (descriptions/361.html)	Computer Architecture I (descriptions/361.html)	MW 12:30-1:50 G. Memik			
COMP_ENG 362 (descriptions/362.html)	Computer Architecture Project (descriptions/362.html)		TuTh 11-12:20 Joseph		
COMP_ENG 365, 465 (descriptions/365-465.html)	Internet-of-Things Sensors, Systems, and Applications			Tu 2:00-4:50 Moawad	

Course	Course Title	Fall 2022	Winter 2023	Spring 2023	Summer 2023
	(descriptions/365-465.html)				
COMP_SCI 368, 468 (descriptions/368-468.html)	Programming Massively Parallel Processors with CUDA (descriptions/368-468.html)		2-3:20 TuTh Hardavellas		
COMP_SCI 371 (descriptions/371.html)	Knowledge Representation and Reasoning (descriptions/371.html)		12:30-1:50 TuTh Alam		12:30-1:50 TuTh Hancock
COMP_SCI 376 (descriptions/376.html)	Game Design and Development (descriptions/376.html)	4-4:50 MWF Horswill			
COMP_SCI 377 (descriptions/377.html)	Game Development Studio (descriptions/377.html)		6-7:20 MW Zubek		
COMP_SCI 392 (descriptions/392.html)	Rapid Prototyping for Software Innovation (descriptions/392.html)	3-3:50 MWF Riesbeck			
COMP_SCI 394 (descriptions/394.html)	Agile Software Development (descriptions/394.html)		3:30-4:50 MW Riesbeck	9:30-10:50 MW Riesbeck	
COMP_SCI 396 (descriptions/396-1.html)	Introduction to Cryptography (descriptions/396-1.html)	9:30-10:50 TuTh Wang			
COMP_SCI 396 (descriptions/396-10.html)	Modeling Relationships with Causal Inference (descriptions/396-10.html)			3:30-4:50 MW Wood-Doughty	
COMP_SCI 396 (descriptions/396-11.html)	Communicating Computer Science (descriptions/396-11.html)			3:30-4:50 MW Bain	
COMP_SCI 396 (descriptions/396-12.html)	Proving Properties of Programs with Mechanized Logic (descriptions/396-12.html)			11-11:50 MWF Findler	
COMP_SCI 396 (descriptions/396-14.html)	Introduction to Computational Linguistics (descriptions/396-14.html)			11-12:20 TuTh Voigt	
COMP_SCI 396 (descriptions/396-15.html)	Social Networks Analysis (descriptions/396-15.html)			3:30-6:20 Th Contractor	Remote/Asynchronous Contractor
COMP_SCI 396 (descriptions/396-16.html)	Advanced Graphics Seminar (descriptions/396-16.html)				
COMP_SCI 396 (descriptions/396-17.html)	Advanced Offense and Defense in Cybersecurity (descriptions/396-17.html)	11-12:20 TuTh Xing			

Course	Course Title	Fall 2022	Winter 2023	Spring 2023	Summer 2023
COMP_SCI 396 (descriptions/396-19.html)	Natural & Artificial Vision (descriptions/396-19.html)			11-12:20 MW Alexander	
COMP_SCI 396 (descriptions/396-2.html)	Artificial Life (descriptions/396-2.html)		9:30-10:50 TuTh Kriegman		
COMP_SCI 396 (descriptions/396-22.html)	Differential Privacy: from Foundations to Machine Learning (descriptions/396-22.html)			11-12:20 MW Dong	
COMP_SCI 396 (descriptions/396-3.html)	Introduction to the Data Science Pipeline (descriptions/396-3.html)	9:30-10:50 or 2-3:20 TuTh Hu			
COMP_SCI 396 (descriptions/396-23.html)	Advanced Graphics Seminar: VR/AR Systems (descriptions/396-23.html)				3:30-5 TuTh Sun
COMP_SCI 396, 496 (descriptions/396-496-10.html)	Programming Languages Seminar (descriptions/396-496-10.html)	3:30-4:50 MW Dimoulas			
COMP_SCI 396, 496 (descriptions/396-496-13.html)	Security and Privacy Education (descriptions/396-496-13.html)		2-3:20 TuTh Bhagavatula		
COMP_SCI 396, 496 (descriptions/396-496-15.html)	Dynamics of Programming Languages (descriptions/396-496-15.html)			2-3:20 TuTh Dimoulas	
COMP_SCI 396, 496 (descriptions/396-496-16.html)	Advanced Topics in Modern Cryptography (descriptions/396-496-16.html)		9:30-10:50 TuTh Wang		
COMP_SCI 396, 496 (descriptions/396-496-18.html)	Topics in Software Engineering (descriptions/396-496-18.html)			3:30-4:50 TuTh St-Amour	
COMP_SCI 396, 496 (descriptions/396-496-19.html)	Introduction to Kolmogorov Complexity (descriptions/396-496-19.html)	3:30-4:50 MW Stull			
COMP_SCI 396, 496 (descriptions/396-496-21.html)	Approximation Algorithms (descriptions/396-496-21.html)		11-12:20 TuTh Makarychev		
COMP_SCI 396, 496 (descriptions/396-496-24.html)	CS Education Research in the Community (descriptions/396-496-24.html)		7:30-8:50 TuTh Horn & Worsley		
COMP_SCI 396, 496 (descriptions/396-496-25.html)	Computing, Ethics, and Society (descriptions/396-496-25.html)			2-3:20 MW Araujo Melo & Chavez	
COMP_SCI 396, 496 (descriptions/396-496-26.html)	Computational Optics (descriptions/396-496-26.html)				11:05-12:25 TuTh (Sync: Class meets

Course	Course Title	Fall 2022	Winter 2023	Spring 2023	Summer 2023
					remotely) Schiffers
COMP_SCI 396, 496 (descriptions/396-496-6.html)	Data Science Seminar (descriptions/396-496-6.html)	12:30-1:50 TuTh Rogers			
COMP_SCI 396 (descriptions/396-5.html)	Generative Methods (descriptions/396-5.html)	8-8:50 MWF Compton			
COMP_SCI 396 (descriptions/396-9.html)	Social AR/VR Studio (descriptions/396-9.html)			5-6:20 MW Compton	
COMP_SCI 397 (descriptions/397-1.html)	Seminar in Statistical Language Modeling (descriptions/397-1.html)			11-12:20 TTh Demeter	
COMP_SCI 397 (descriptions/397-2.html)	Computer Science Education (descriptions/397-2.html)		6:30-9:20 M Horn		
COMP_SCI 397, 497 (descriptions/397-497-10.html)	Multimodal learning analytics and interaction analysis (descriptions/397-497-10.html)		9:30-12:20 Tu Worsley		
COMP_SCI 397, 497 (descriptions/397-497-12.html)	Selected Topics in Computer Networks (descriptions/397-497-12.html)			12:30-1:50 TuTh Kuzmanovic	
COMP_SCI 397, 497 (descriptions/397-497-14.html)	Wireless and Mobile Health (mHealth) (descriptions/397-497-14.html)		5-6:20 TuTh Alshurafa & Pedram		
COMP_SCI 397, 497 (descriptions/397-497-15.html)	Innovation Lab: Building Technologies for the Law (descriptions/397-497-15.html)		2:35-5:30 Tu Hammond & Linna Jr.		
COMP_SCI 397, 497 (descriptions/397-497-2.html)	Advanced Topics in Compilers (descriptions/397-497-2.html)			5-6:20pm TuTh Campanoni	
COMP_SCI 397, 497 (descriptions/397-497-20.html)	Wireless Protocols for the Internet of Things (descriptions/397-497-20.html)		3:30-4:50 MW Ghena		
COMP_SCI 397, 497 (descriptions/397-497-3.html)	Sports, Technology and Learning (descriptions/397-497-3.html)	12:30-1:50 MW Worsley			
COMP_SCI 397, 497 (descriptions/397-497-4.html)	(Special Topics) Innovation in Journalism & Technology (descriptions/397-497-4.html)	2-3:50 TuTh Hammond & Wise	2-3:50 TuTh Wise	2-3:20 TuTh Hammond & Wise	
COMP_SCI 401 (descriptions/401.html)	Introduction to Graduate Studies in Computer Science (descriptions/401.html)	10-10:50 MWF Khuller & Hullman			

Course	Course Title	Fall 2022	Winter 2023	Spring 2023	Summer 2023
COMP_SCI 409 (descriptions/409.html)	Swarms and Multi-Robot Systems (descriptions/409.html)	2-3:20 TuTh Rubenstein			
COMP_SCI 410 (descriptions/410.html)	Quadrotor Design and Control (descriptions/410.html)		12:30-3:20 Th Rubenstein		
COMP_SCI 440 (descriptions/440.html)	Advanced Networking (descriptions/440.html)	11-12:20 TuTh Bustamante			
COMP_SCI 445 (descriptions/445.html)	Internet-scale Experimentation (descriptions/445.html)		9:30-10:50 TuTh Bustamante		
COMP_SCI 446 (descriptions/446.html)	Kernel and Other Low-level Software Development (descriptions/446.html)			11-1:50 M Dinda	
COMP_SCI 449 (descriptions/449.html)	Deep Learning (descriptions/449.html)		11-11:50 MWF Wood-Doughty	3:30-4:50 TTh Wood-Doughty	
COMP_SCI 450 (descriptions/450.html)	Internet Security (descriptions/450.html)		9:30-10:50 MW Chen		
COMP_ENG 452 (descriptions/452.html)	Advanced Computer Architecture I (descriptions/452.html)		MW 12:30-1:50 Joseph		
COMP_ENG 453 (descriptions/453.html)	Parallel Architectures (descriptions/453.html)			MW 3:30-4:50 Joseph	
COMP_ENG 456 (descriptions/456.html)	Modern Topics in Computer Architecture (descriptions/456.html)			TuTh 11:00–12:20 Hardavellas	
COMP_ENG 459 (descriptions/459.html)	VLSI Algorithmics (descriptions/459.html)		MW 2-3:20 S. Ogrenci		
COMP_SCI 474 (descriptions/474.html)	Probabilistic Graphical Models (descriptions/474.html)				
COMP_SCI 496 (descriptions/496-15.html)	Special Topics In Data Systems Seminar (descriptions/496-15.html)	2-3:20 TuTh Crotty			
COMP_SCI 496 (descriptions/496-21.html)	Qualitative Reasoning Seminar (descriptions/496-21.html)			2-3:20 TuTh Forbus	
COMP_SCI 496 (descriptions/496-23.html)	AI Perspectives: Symbolic Reasoning to Deep Learning (descriptions/496-23.html)			2-4:50 F Alam	

Course	Course Title	Fall 2022	Winter 2023	Spring 2023	Summer 2023
COMP_SCI 496 (descriptions/496-24.html)	Visualization for Scientific Communication (descriptions/496-24.html)		2:30 -5:20 M Kay		
COMP_SCI 496 (descriptions/496-25.html)	Generative Deep Models (descriptions/496-25.html)	1-1:50 MWF Pardo		WF 5-7pm Pardo	
COMP_SCI 496 (descriptions/496-29.html)	Advanced System Security (descriptions/496-29.html)			9-11:50 F Xing	
COMP_SCI 496 (descriptions/496-30.html)	Logic In AI (descriptions/496-30.html)	9:30-10:50 MW Subrahmanian			
COMP_SCI 496 (descriptions/496-31.html)	Computational Optics (descriptions/496-31.html)	9:30-10:50 TuTh Alexander			
COMP_SCI 496 (descriptions/496-32.html)	Modern Discrete Probability (descriptions/496-32.html)	12:30-1:50 TuTh Gaudio			
COMP_SCI 496 (descriptions/496-33.html)	Mathematical and Computational Foundations of Tensors and Applications (descriptions/496-33.html)			3-3:50 MWF Evert	
COMP_SCI 496 (descriptions/396-496-27.html)	HCI Methods for Health Research (descriptions/396-496-27.html)			1-3:50 M Jacobs	
COMP_SCI 496 (descriptions/496-35.html)	Randomized Algorithms in Linear Algebra and Scientific Computing (descriptions/496-35.html)			9:30-10:50 MW (May 1-17, see details below) Kolda	
COMP_SCI 496 (descriptions/496-7.html)	The Design of Technological Tools for Thinking and Learning (descriptions/496-7.html)		2-4:50 W Wilensky		
COMP_SCI 497 (descriptions/497-10.html)	Learning Augmented Online Algorithms (descriptions/497-10.html)	9:30-12:20 W Bhaskara			
COMP_SCI 497 (descriptions/497-11.html)	Explanation and reproducibility in data-driven science (descriptions/497-11.html)		3:30-4:50 MW Hullman		
COMP_SCI 497 (descriptions/497-12.html)	Recent Highlights in Theoretical Computer Science (descriptions/497-12.html)		2-4:50 F Vijayaraghavan		
COMP_SCI 497	Digital Musical Instrument			10:00-2 T	

Course	Course Title	Fall 2022	Winter 2023	Spring 2023	Summer 2023
(descriptions/497-3.html)	Design (descriptions/497-3.html)			Pardo	
COMP_SCI 497 (descriptions/497-4.html)	The Design of Tools and Technologies for Computer Science Education (descriptions/497-4.html)	2-4:50 F O'Rourke			
COMP_SCI 497 (descriptions/497-6.html)	Deep Learning for Natural Language Processing (descriptions/497-6.html)		12:30-1:50 TuTh Demeter		
COMP_SCI 497 (descriptions/497-8.html)	Data Economics (descriptions/497-8.html)	2-4:50 F Hartline			