SOFTWARE ENGINEERING ELECTIVES			
COURSE #	**TITLE**	**CREDITS**	**PREREQUISITES**
S E 342 x: COM S	Principles of Programming Languages	3	Minimum of C- in Math 165 and COM S 228; and COM S 230 or CPR E 310
S E 362 x: COM S	Object-Oriented Analysis and Design	3	Minimum of C- in Math 165 and COM S 228; and ENGL 250
S E 409 x: COM S	Software Requirements Engineering	3	COM S 309
S E 412 x: COM S/CPR E	Formal Methods in Software Engineering	3	COM S 311; and STAT 330
S E 416 x: CPR E	Software Evolution and Maintenance	3	COM S 309
S E 417 x: COM S	Software Testing	3	COM S 309; COM S 230 or CPR E 310; ENGL 250; and SP CM 212
S E 419 x: CPR E	Software Tools for Large Scale Data Analysis	4	COM S 228
S E 421 x: CPR E	Software Analysis & Verification for Safety and Security	3	SE 309 and either CPRE 310 or COMS 230 or COMS 311
COM S 410	Distributed Development of Software	3	COM S 228; COM S 309; and COM S 327
COM S 413	Foundations and Applications of Program Analysis	3	COM S 342
COM S 415/515	Software System Safety	3	COM S 309 or COM S 311
COM S 440/540	Principles and Practice of Compiling	3	COM S 331 or COM S 342; ENGL 250; and SP CM 212
CPR E 414	Introduction to Software Systems for Big Data Analytics	4	COM S 363; or CPR E 315 or CPR E 308; or COM S 311 or COM S 352

TECHNICAL ELECTIVES			
Any SE Elective can be used to fill this requirement.			
COURSE #	**TITLE**	**CREDITS**	**PREREQUISITES**
COM S 418/518	Introduction to Computational Geometry	3	COM S 311 or permission of the instructor
COM S 430	Concurrent Programming in Practice	3	COM S 311; COM S 362 or 363; ENGL 250; and SP CM 212
COM S 435/535	Algorithms for Large Data Sets: Theory & Practice	3	COM S 311 or equivalent/permission of instructor
COM S 437	Computer Game and Media Programming	3	COM S 336
COM S 454/554 x: CPR E	Distributed Systems	3	COM S 311; and COM S 352 or CPR E 308/permission of instructor
COM S 461/561	Principles and Internals of Database Systems	3	COM S 311; ENGL 250; and SP CM 212/permission of instructor
COM S 486	Fundamental Concepts in Computer Networking	3	COM S 352 or CPR E 308
COM S 487/587	Network Programming, Applications and Research Issues	3	COM S 352 or CPR E 489 or equivalent/permission of instructor
CPR E 426/526 x: COM S	Introduction to Parallel Algorithms and Programming	4	CPR E 308 or COM S 321; and CPR E 315 or COM S 311
CPR E 430/530 x :INFAS	Network Protocols and Security	3	CPR E 288 or CPR E 331
CPR E 450/550	Distributed Systems and Middleware	3	CPR E 308 or COM S 352
CPR E 458/558	Real Time Systems	3	CPR E 308 or COM S 352
CPR E 489	Computer Networking & Data Communications	4	CPR E 381 or E E 324

SUPPLEMENTARY ELECTIVES			
Any SE Elective & Technical Elective can be used to fill this requirement.			
COURSE #	**TITLE**	**CREDITS**	**PREREQUISITES**
C E 388 x: A B E/E E	Sustainable Engineering and International Development	3	Junior classification in engineering
COM S 252	Linux Operating System Essentials	3	CPR E 185 or SE 185 or COM S 127 or COM S 207 or COM S 227
COM S 327	Advanced Programming Techniques	3	Minimum of C- in COM S 228 and MATH 165
COM S 331 x: LING	Theory of Computing	3	Minimum of C- in COM S 228, MATH 166, and in COM S 230 or CPR E 310; and ENGL 250
COM S 336	Introduction to Computer Graphics	3	COM S 327; and co-requisite MATH 207 or MATH 317
COM S 421 x: MATH	Logic for Mathematics and Computer Science	3	MATH 301 or MATH 207 or MATH 317 or COM S 230 or CPR E 310
COM S 424 x: CPR E/MATH	Introduction to High Performance Computing	3	MATH 265; and MATH 207 or MATH 317/permission of instructor
COM S 425 x: CPR E	High Performance Computing for Scientific and Engineering Applications	3	COM S 31; ENGL 250; and SP CM 212
COM S 433/533	Molecular Programming of Nanoscale Devices and Processes	3	Minimum of C- in COM S 331/permission of the instructor
COM S 444 x: BCB/BCBIO/ BIOL/CPR E/ GEN	Bioinformatic Analysis	4	MATH 165; and Introductory Statistics (STAT 101, STAT 104, STAT 105, STAT 201, or STAT 330)
COM S 455/555	Simulation: Algorithms and Implementation	3	COM S 311; STAT 305 or 330; ENGL 150; and SP CM 212/permission of instructor
COM S 472/572	Principles of Artificial Intelligence	3	COM S 311, COM S 230 or CPR E 310, STAT 330, ENGL 250, SP CM 212, COM S 342 or comparable programming experience
COM S 474	Introduction to Machine Learning	3	COM S 311, COM S 230 or CPR E 310, STAT 330, MATH 165, ENGL 250, SP CM 212, COM S 342 or comparable programming experience
COM S 476X/ 576X	Motion Strategy Algorithms and Applications	3	ENGL 250, SP CM 212, COM S 311
COM S 477/577	Problem Solving Tech. for Applied Computer Science	3	COM S 228; CPR E 310 or COM S 230; MATH 166; MATH 207 or MATH 317; or consent of instructor
COM S 481 x: MATH	Numerical Methods for Differential Equations	3	MATH 265; and MATH 266 or MATH 267

SUPPLEMENTARY ELECTIVES, *continued*			
Any SE Elective & Technical Elective can be used to fill this requirement.			
COURSE #	**TITLE**	**CREDITS**	**PREREQUISITES**
COM S 490	Independent Study	1-2	Permission of instructor NOTE: Can only apply 2 credits to supplementary electives
COM S 575 x: CPR E, HCI	Computational Perception	3	Graduate standing or permission of instructor
CPR E 230	Cyber Security Fundamentals	3	COM S 227, E E 285, or MIS 207
CPR E 231	Cyber Security Concepts and Tools	3	CPR E 230
CPR E 288	Embedded Systems I: Introduction	4	CPR E 281; and COM S 207 or COM S 227 or E E 285
CPR E 331	Application of Cryptographic Concepts to Cyber Security	3	CPR E 231
CPR E 388	Embedded Systems II: Mobile Platforms	4	CPR E 288
CPR E 418 x: E E	High Speed Systems Engineering Measurement and Testing	4	E E 230; and E E 311
CPR E 431	Basics of Information System Security	3	Credit or enrollment in CPR E 308 or COM S 352
CPR E 483	Hardware Software Integration	4	CPR E 381
CPR E 488	Embedded Systems Design	4	CPR E 381 or COM S 321
CPR E 490	Independent Study	1-2	Senior classification in computer engineering NOTE: Can only apply 2 credits to supplementary electives
M E 484/584 x: WLC	Technology, Globalization, and Culture	3	Junior or Senior classification for M E 484 /graduate classification for M E 584
SE 490	Independent Study	1-2	Permission of instructor NOTE: Can only apply 2 credits to supplementary electives
STAT 483	Empirical Methods of Computational Sciences	3	STAT 330 or an equivalent course; MATH 166; and knowledge of linear algebra
STAT 484	Computer Processing of Scientific Data	3	STAT 301 or STAT 326 or STAT 401 or STAT 587
STAT 486	Introduction to Statistical Computing	3	STAT 301 or STAT 326 or STAT 401 or STAT 587

ECON ELECTIVES			
COURSE #	**TITLE**	**CREDITS**	**PREREQUISITES**
ECON 101	Principles of Microeconomics	3	
ECON 102	Principles of Macroeconomics	3	ECON 101 recommended
I E 305	Engineering Economic Analysis	3	MATH 166

MATH ELECTIVES			
COURSE #	**TITLE**	**CREDITS**	**PREREQUISITES**
MATH 207	Matrices and Linear Algebra	3	Two semesters of calculus
MATH 265	Calculus III	4	Minnimum of C- in MATH 166 or MATH 166H
MATH 304	Combinatorics	3	MATH 166 or 166H; MATH 201 or experience with proofs
MATH 314	Graphs Theory	3	MATH 166 or 166H; MATH 201 or experience with proofs
MATH 317	Theory of Linear Algebra	4	MATH 166; credit or enrollment in MATH 201