

KEAN UNIVERSITY – COLLEGE OF SCIENCE, MATHEMATICS AND TECHNOLOGY
 (78309) B.S. in Computer Science (5-year M.S. Computer Information Systems option): 126 S.H.
 Minimum GPA Required for Declaration: 3.0
 Minimum GPA Required for Major: 3.0
 Overall Minimum GPA Required for Graduation: 3.0

EFFECTIVE DATE: Fall 2021

GENERAL EDUCATION		33 S.H.	ACADEMIC MAJOR		50 S.H.
Foundation Requirements ¹		13 S.H.	Major Core ^{**}		14 S.H.
GE 1000 Transition to Kean ² or GE 3000 Transfer Transitions ²	1		CPS 2231 Computer Programming ⁵		4
ENG 1030 College Composition ³	3		CPS 2232 Data Structures		4
MATH 1054 Precalculus ⁴	3		CPS 2390 Computer Organization and Architecture		3
COMM 1402 Speech Communication as Critical Citizenship	3		CPS 3250 Computer Operating Systems		3
GE 2024 Research & Technology	3				
Disciplinary & Interdisciplinary Distribution Requirements ¹			Major Concentration ^{**}		15 S.H.
Humanities		6 S.H.	CPS 3440 Analysis of Algorithms		3
ENG 2403 World Literature [*]	3		CPS 3498 Computer Security		3
<i>take one "GE Approved" course from one area below</i>			CPS 3962 Object Oriented Analysis & Design ^{WE}		3
Fine Arts/Art History	3		CPS 4150 Computer Architecture or CPS 4200 Systems Programming		3
Foreign Languages (<i>must take I and II for credit</i>)	3		CPS 4222 Principles of Networking		3
Music or Theatre	3				
Interdisciplinary	3		Major Electives ^{**}		18 S.H.
Social Sciences		6 S.H.	CPS 3xxx or 4xxx		3
HIST 1062 Worlds of History [*]	3		CPS 3xxx or 4xxx		3
<i>take one "GE Approved" course from one area below</i>			CPS 3xxx or 4xxx		3
Psychology	3		CPS 3xxx or 4xxx		3
Economics or ES 1010 World Geography	3		CPS 5100 Computer Information Systems ⁷		3
Political Science	3		CPS 5440 Advanced Analysis of Algorithms ⁷		3
Sociology or Anthropology	3				
Interdisciplinary	3		Major Capstone ^{**}		3 S.H.
			CPS 4951 Senior Project or CPS 4961 Senior Research ¹⁰		3
Science and Mathematics		8 S.H.			
CPS 1231 Fundamentals of Computer Science ^{**5}	4		FREE ELECTIVES		7-11 S.H.
Lab Science (BIO 1300, CHEM 1083, or PHYS 2091/95) ⁶	4		<i>at least 50% must be 3000/4000 level</i>		
			<i>(recommended: CPS 1996 Research Initiative for Freshmen)⁸</i>		1
			<i>(recommended: CPS 2010 Career Education)⁸</i>		1
			<i>(recommended: CPS 3291/92/93 Career Internship in CS)⁹</i>		1-6
ADDITIONAL REQUIRED COURSES ^{**}		32-36 S.H.			
Lab Science II (BIO 1400, CHEM 1084, or PHYS 2092/96) ⁶	4		Special Notes:		
TECH 2920 Computer Systems	3		¹ See pre-requisites and equivalencies (on page 2)		
ENG 3091 Technical Writing	3		² University requirement for graduation for all undergraduate students that must be satisfied in one of two ways: Complete GE 1000 (all freshmen and transfers entering with 0-29 credits) OR complete GE 3000 (transfers entering with 30 credits or more)		
MATH 2110 Discrete Structures	3		³ ENG 1030 requires grade of C or higher		
MATH 2415 Calculus I ⁴	4		^{4,5,6,7,8,9} See notes (on page 2)		
MATH 2416 Calculus II or MATH 2995 Matrix & Linear Algebra	3/4		¹⁰ Prior research experience and petition required for CPS 4961		
MATH 2526 Applied Statistics I	3		*GE Distribution course required of all students		
MATH 3120, 3155, 3225, 3415, 3455, 3526, 3544, 3815, or 3940	3/4		**All Major courses, All Additional and supporting courses, including Capstone requires grade of B- or higher		
MATH or Science (2000-4000 level only for MATH)	3/4		^{WE} Writing Emphasis course		
MATH or Science (2000-4000 level only for MATH)	3/4				

GENERAL EDUCATION AND UNIVERSITY REQUIREMENTS

GENERAL EDUCATION INFORMATION AND REQUIREMENTS

Testing and Placement

Incoming freshmen and transfer students may be placed in specific GE Foundations, Developmental or ESL courses as a result of testing and/or multiple measures placement prior to registration. Students may be exempt from testing due to SAT/ACT scores or prior college work.

Prerequisites and Equivalencies for GE Foundations Courses

GE 1000/GE 3000 is a University Graduation Requirement

GE 1000

Required of all freshmen & transfers entering with 0-29 credits

Prereq: None

Equiv: ID 1001

GE 3000

Required of transfers entering with 30 credits or more

Prereq: 30 credits and ENG 1030

ENG 1030

Prereq: Placement testing or exemption from placement testing

ENG 1025 if required by placement testing

Equiv: ENG 1031/1032, ENG 1033/1034, ENG 1430 (ESL version), ENG 1620 (Honors version),

ENG 1020, ENG 1400

MATH 1000 or MATH 1044*

Prereq: MATH 0901 if required by placement testing

*MATH 1044 is available as a Foundation option for CBPM students only

Equiv of MATH 1000: MATH 1001/1002, MATH 1003/1004, MATH 1051

MATH 1010 or 1016 or 1030

Prereq: MATH 0901 if required by placement testing

Co-requisite: Math 0902 (only required, with advisement, based on placement test score and intended major)

MATH 1054

Prereq: MATH 0901 if required by placement testing and MATH 1000

COMM 1402

Prereq: CS 0412 if required by placement testing

ENG 1025 if required by placement testing

May be taken concurrently with ENG 1030

Equiv: COMM 1400

GE 2021- 2026 Research and Technology is offered as college-based course

GE 2021 College of BPM

GE 2022 College of EDU

GE 2023 All College of CLA

GE 2024 College of NAHS & NJCSTM & NWGC (Speech Language and Hearing Science majors)

GE 2025 SFPA & Michael Graves College

GE 2026 Undecided Majors and other special populations

Prereqs: CS 0412 if required by placement testing; ENG 1030 or equivalent course

Equiv: GE 2020

GE Distribution Courses

Approved GE Distribution Courses

All courses taken under the General Education Disciplinary/Interdisciplinary Distribution requirements must be selected from the Approved General Education Distribution Course List.

These courses are designated as GEHU, GESS, and GESM.

GEHU Humanities

GESS Social Sciences

GESM Science and Mathematics

Required GE Distribution Courses

ENG 2403 is a required Humanities Distribution course with an emphasis on diversity.

Prereq: CS 0412 if required by placement testing; ENG 1030 or equivalent

Equiv: ENG*2203

HIST 1062 is a required Social Sciences Distribution course.

Prereq: None

Foreign Language Credit

The three credits for a foreign language that may satisfy the GE Disciplinary/Interdisciplinary Distribution Requirement are awarded only upon successful completion of the second of two semesters of study at the introductory or intermediate level.

Credit for the first semester may be used as elective credit.

UNIVERSITY REQUIREMENTS

GE 1000/3000 Requirement

All undergraduate students must satisfy this University requirement for graduation by successfully completing one of the following courses at Kean University: GE 1000 Transition to Kean (all freshmen and transfers entering with 0-29 credits) or GE 3000 Transfer Transitions (transfers entering with 30 credits or more).

Writing-Emphasis Requirement

All students are required to complete one "Writing- Emphasis" course. The "W-E" course must be within the major portion of your program. Consult your major program advisor for specific information.

Note: Equivalent courses may be prior General Education or prerequisite course work taken by students that is now discontinued.

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⁴ Students who do not qualify on the placement test to take MATH 1054, must take MATH 1000 first (In this case, MATH 1000 will fulfill Free Electives). Students eligible to take MATH 2415 based on their placement test may take that course in place of MATH 1054 (In this case, MATH 2415 will fulfill GE Foundation Requirements and the student may take an additional 3 credits in Free Electives to total 120 S.H.).

⁵ Students who have had prior programming experience may enter CPS 2231 directly with approval of the Departmental Advisory Committee (In this case, CPS 2231 will fulfill GE Science and Mathematics Distribution and the student may take another 4 credits in Major Electives to total 120 S.H.).

⁶ A 2-semester Lab Science sequence, with 4 credits in GE Science and Mathematics Distribution and 4 credits in Additional Requirements. Both Lab Science courses must be from the same department (BIO, CHEM, or PHYS).

⁷ With approval of the Graduate Program Coordinator, undergraduate students take two CPS 5xxx level graduate courses as Major Electives

(NOTE: For any graduate course to be credited towards the 5-year M.S. in CIS program, students must take additional credits in Major or Free Electives to total 126 S.H.).

⁸ Optional Freshman Research Course

Students can take 1 credit which may fulfill Free Electives requirements with approval of the Departmental Advisory Committee. CPS 1996 Research Initiative for Freshmen is recommended to be taken in the second semester of the freshman year. CPS 1996, CPS 2010 are courses acceptable for use in Free Electives and are managed by the School of Computer Science and Technology.

⁹ Optional Internship Course

Students can take a maximum of 6 credits for CPS 3291/92/93 Career Internship in CS which are internship courses acceptable for use in Free Electives managed by Career Services. Students interested should contact Career Services.

Additional Required Courses Prerequisites (Pre/corequisites may change, consult KeanWise)

Course	Prerequisite
TECH 2920 Computer Systems	CPS 1231
ENG 3091 Technical Writing	ENG 1030
MATH 2110 Discrete Structures	
MATH 2415 Calculus I	MATH 1504
MATH 2526 Applied Statistics I	
MATH 2416 Calculus II or MATH 2995 Matrix & Linear Algebra	MATH 2415
MATH 3120 Combinatorics	MATH 3110
MATH 3155 Mathematical Logic	
MATH 3225 Matrix & Linear Algebra II	MATH 2416 and MATH 2995
MATH 3415 Calculus III (4 S.H.)	
MATH 3455 Differential Equations	MATH 2416
MATH 3544 Probability and Mathematical Statistics	
MATH 3940 Numerical Analysis	
MATH 3526 Applied Statistics II	MATH 2526
MATH 3815 Cryptography & Cryptanalysis	No Prerequisite

REQUIREMENTS FOR DECLARATION TO THE MAJOR

The School of Computer Science and Technology has adopted the following standards for declaration to all options of the Computer Science major:

- Minimum cumulative GPA of 3.0 at the time of declaration to the major.
- Completion of at least 14 credits of CPS Major courses at Kean University with a grade of B- or higher in each.

Your Your major department is located in Green Lane Academic Building (GLAB), Room 228, Tel: 908-737-4700.

(79870) Master of Science in Computer Information Systems

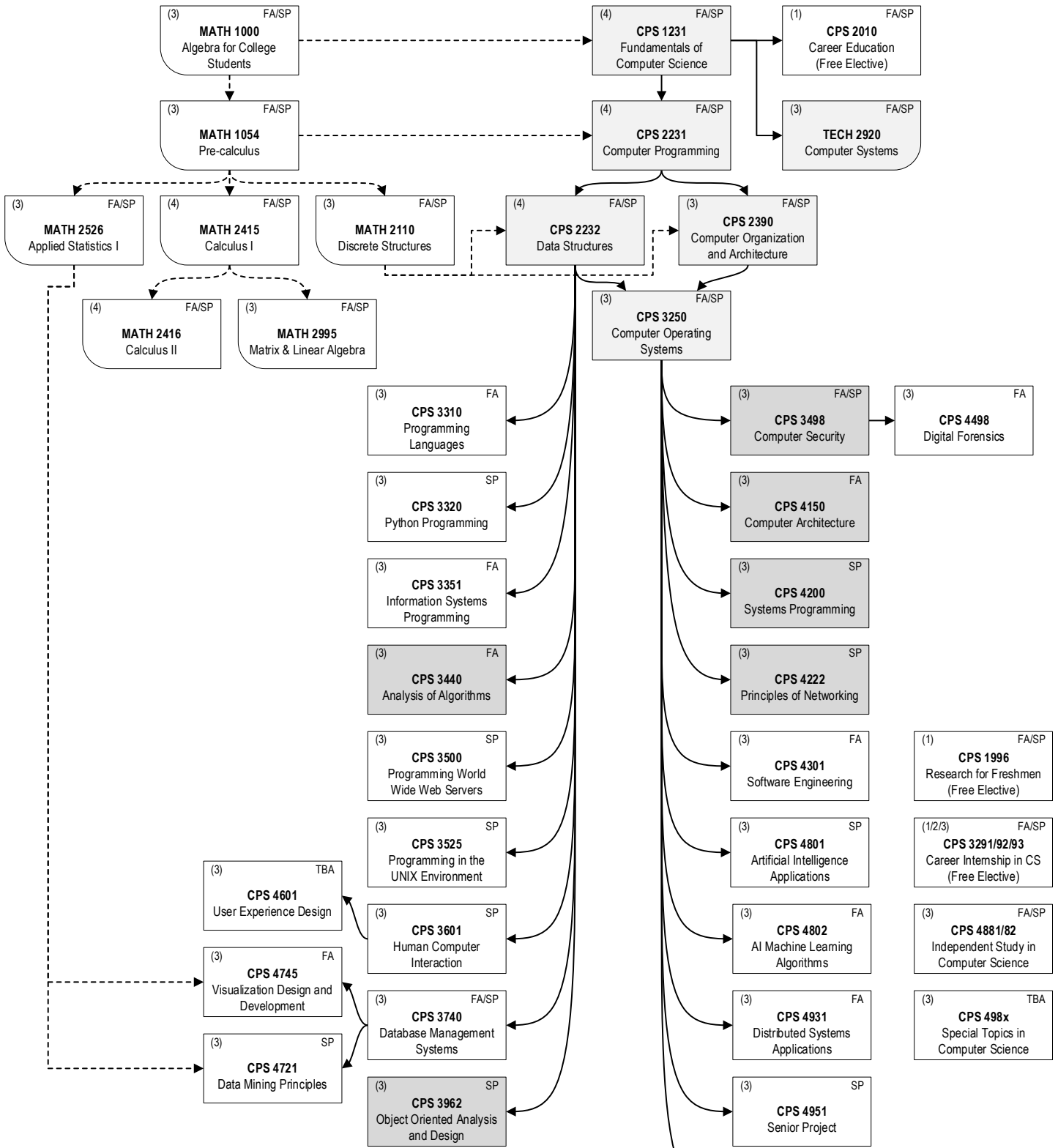
CORE COURSES – 15 CREDITS		
CPS 5100	Computer Information Systems	3 credits
CPS 5301	Software Engineering	3 credits
CPS 5440	Advanced Analysis of Algorithms	3 credits
CPS 5740	Database Systems	3 credits
CPS 5981	Software Assurance	3 credits

ELECTIVES – 12 CREDITS		
CPS 5498	Digital Forensics and Investigation	3 credits
CPS 5500	Web Design and Development	3 credits
CPS 5601	Human Computer Interaction	3 credits
CPS 5721	Data Mining	3 credits
CPS 5745	Interactive Information visualization	3 credits
CPS 5801	Artificial Intelligence and Expert Systems	3 credits
CPS 5802	Machine Learning Innovation	3 credits
CPS 5881/2	Independent Graduate Study in Computer Science	3 credits
CPS 5900	Numerical Analysis	3 credits
CPS 5910	Computer Simulations of Models	3 credits
CPS 5930	Operating System Concepts	3 credits
CPS 5931	Network Systems	3 credits
CPS 5960	Operations Research: Models and Algorithms	3 credits
CPS 5965	High Performance Computing	3 credits
CPS 5990	Special Topics	3 credits

CAPSTONE – 3 CREDITS		
CPS 5995	CIS Capstone	3 credits

TOTAL OF 30 CREDITS TO COMPLETE PROGRAM

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Legend			
FA/SP	Offered Semester	(#)	Semester Hour
	Prerequisite		CPS Major Core
	IT courses		CPS Major Concentration
	Math courses		CPS Major Electives

Computer Science Course List

Course #	S.H.	Course Title	FA	SP	Prerequisites
CPS 1010	1	Introduction to Computing Systems at Kean	*	*	CPS 1231; Transfer students only; 1 Credit; P/F
CPS 1231	4	Fundamentals of Computer Science	*	*	MATH 1000
CPS 2231	4	Computer Programming	*	*	CPS 1231 and MATH 1054
CPS 2232	4	Data Structures	*	*	CPS 2231 and MATH 2110
CPS 2390	3	Computer Organization and Architecture	*	*	CPS 2231 and MATH 2110
CPS 3250	3	Computer Operating Systems	*	*	CPS 2232 and CPS 2390
CPS 3310	3	Programming Languages	*		CPS 2232 or CPS 2240
CPS 3320	3	Python Programming		*	CPS 2232 or CPS 2240
CPS 3351	3	Information Systems Programming	*		CPS 2232
CPS 3440	3	Analysis of Algorithms	*		CPS 2232
CPS 3498	3	Computer Security	*	*	CPS 3250
CPS 3500	3	Programming World Wide Web Servers		*	CPS 2232
CPS 3525	3	Programming in the UNIX Environment		*	CPS 2232
CPS 3601	3	Human Computer Interaction		*	CPS 2232
CPS 3740	3	Database Management Systems	*	*	CPS 2232
CPS 3962	3	Object Oriented Analysis and Design		*	CPS 2232
CPS 4150	3	Computer Architecture	*		CPS 3250
CPS 4200	3	Systems Programming		*	CPS 3250
CPS 4222	3	Principles of Networking		*	CPS 3250
CPS 4301	3	Software Engineering	*		CPS 3250
CPS 4498	3	Digital Forensics	*		CPS 3498
CPS 4601	3	User Experience Design	TBA		CPS 3601
CPS 4721	3	Data Mining Principles		*	CPS 3740 and MATH 2526
CPS 4745	3	Visualization Design and Development	*		(CPS 3740 or TECH 3740) and MATH 2526
CPS 4801	3	Artificial Intelligence Applications		*	CPS 3250
CPS 4802	3	AI Machine Learning Algorithms	*		CPS 3250
CPS 4881/82	3	Independent Study in CS	*	*	Faculty permission
CPS 4931	3	Distributed Systems Applications	*		CPS 3250
CPS 4951	3	Senior Project		*	CPS 3250; To be taken final spring semester
CPS 4961	3	Senior Research	*	*	Faculty permission; By arrangement
CPS 498x	3	Special Topics in CS			Faculty permission; Topics vary
Information Technology Courses					
TECH 2920	3	Computer Systems	*	*	CPS 1231
Cooperative Education Program for CS					
CPS 2010	1	Career Education	*	*	CPS 1231; Fulfills Free Electives
CPS 3010	0	Cooperative Education I	*	*	CPS 2010; For full-time co-op program students only
CPS 3011	0	Cooperative Education II	*	*	CPS 2010; For full-time co-op program students only
CPS 4010	0	Cooperative Education Practicum	*	*	CPS 3010; For full-time co-op program students only
Freshman Research and Internship for CS					
CPS 1996	1	Research Initiative for Freshman	*	*	Faculty permission; Fulfills Free Electives
CPS 3291-93	1-3	Career Internship in Computer Science	*	*	Faculty permission; Fulfills Free Electives

(78309) B.S. in CS/M.S. in CIS: 5-year study Plan, total 126+24 = 150 credits

This first-year study plan is for new students only. All new students should see their CS/IT faculty advisor (in Oct) to review and update their 4-year study plans before the early registration period (in Nov). **Students should pay attention to each course's prerequisites and the offered semester (CourseID CourseName (credits) (semester offered))**. Please check the academic guide sheets at <http://yoda.kean.edu/studyplans/>

Name:		Faculty Advisor:
Kean Id#		Catalog Year:

Notes: (Tip) Modify this template by typing the year, moving courses around, adding rows, etc. and make your personalized study plan.

1st Year Fall (15)	1st Year Spring (17)
MATH 1054 Precalculus (3)	MATH 2110 Discrete Structures (3)
TECH 1010 IT Foundations (3) (FA/SP)	CPS 2231 Computer Programming (4) (FA/SP)
ENG 1030 College Composition (3)	COMM 1402 Speech Communication (3)
GE 1000/3000 Transition to Kean (1)	HIST 1062 Worlds of History (3)
Lab Science 1 (4)	Lab Science 2 (4)

Internship, summer course, or summer research

2nd Year Fall (17)	2nd Year Spring (16/17)
MATH 2415 Calculus I (4)	MATH 2416 Calculus II (4) or MATH 2995 Linear Algebra (3)
CPS 2232 Data Structures (4) (FA/SP)	TECH 2920 Computer Systems (3) (FA/SP)
CPS 2390 Computer Org. and Arch. (3) (FA/SP)	CPS 3250 Computer Operating Systems (3) (FA/SP)
ENG 2403 World Literature (3)	ENG 3091 Technical Writing (3)
GE 2024 Research and Technology (3)	Social Sciences (3)
	CPS 2010 Career Education – recommend Free Elective #1 (1)

Internship, summer course, or summer research

3rd Year Fall (15/16)	3rd Year Spring (15/16)
MATH 2526 Applied Statistics I (3)	CPS 3962 Object Oriented Analysis & Design (3) (SP)
CPS 3440 Analysis of Algorithms (3) (FA)	CPS 4200 Systems Prog. (3) (SP) or CPS Elective (3) #1
CPS 3498 Computer Security (3) (FA/SP)	CPS Elective (3) #1 (recommend CPS 3740 (3) Database)
MATH or Science (3/4) #1	MATH or Science (3/4) #2
Humanities (3)	Free Elective (3) #2

Internship, summer course, or summer research

4th Year Fall (12+3)	4th Year Spring (12+3)
MATH Elective 3xxx (3/4)	CPS 4951 Senior Project (3) (SP)
CPS 4150 Computer Arch. (3) (FA) or CPS Elective (3) #1	CPS 4222 Principles of Networking (3) (SP)
CPS Elective (3) #3	CPS Elective (3) #4
Free Elective 3000/4000 (3) #3	Free Elective 3000/4000 (3) #4
CPS 5440 Advanced Analysis of Algorithms (3) (FA)	CPS 5100 Computer Information Systems (3) (SP)

Internship, summer course, or summer research

5th Year Fall (12)	5th Year Spring (12)
CPS 5740 Database Systems (3) (FA)	CPS 5981 Software Assurance (3) (SP)
CPS 5301 Software Engineering (3) (FA)	CPS 5995 CIS Capstone (3) (SP)
CPS 5xxx Elective #1 (3)	CPS 5xxx Elective #3 (3)
CPS 5xxx Elective #2 (3)	CPS 5xxx Elective #4 (3)

Fall offered CPS Major Electives	Spring offered CPS Major Electives
CPS 3310 Programming Languages (3) (FA)	CPS 3320 Python Programming (3) (SP)
CPS 3351 Information Systems Programming (3) (FA)	CPS 3498 Computer Security (3) (FA/SP)
CPS 3440 Analysis of Algorithms (3) (FA)	CPS 3525 Programming in the UNIX Environment (3) (SP)
CPS 3498 Computer Security (3) (FA/SP)	CPS 3601 Human Computer Interaction (3) (SP)
CPS 4150 Computer Architecture (3) (FA)	CPS 3962 Object Oriented Analysis & Design (3) (SP)
CPS 4301 Software Engineering (3) (FA)	CPS 4200 Systems Programming (3) (SP)
CPS 4498 Digital Forensics (3) (FA)	CPS 4222 Principles of Networking (3) (SP)

Rev. 08/2021

Note: The course sequence and layout provided is an estimate, based on available information and may change, due to program requirements, student performance, and may be subject to human error. All students should check their study plans and take personal responsibility for accuracy and correctness.

CPS 4931 Distributed Systems Applications (3) (FA)	CPS 4801 Artificial Intelligence Applications (3) (SP)
CPS 3310 Programming Languages (3) (FA)	
CPS 3351 Information Systems Programming (3) (FA)	CPS 5500 Web Design and Development (3) (SP)
	CPS 5601 Human Computer Interaction (3) (SP)
CPS 5498 Digital Forensics and Investigation (3) (FA)	CPS 5721 Data Mining (3) (SP)
CPS 5745 Interactive Information visualization (3) (FA)	CPS 5801 Artificial Intelligence and Expert Systems (3) (SP)
CPS 5802 Machine Learning Innovation (3) (FA)	CPS 5931 Network Systems (3) (SP)
CPS 5965 High Performance Computing (3) (FA)	