KEAN UNIVERSITY – COLLEGE OF NATURAL, APPLIED & HEALTH SCIENCES

(78038) B.S. in Computer Science (Data Science Option): 120 S.H.

Minimum GPA Required for Declaration: 2.50

Minimum GPA Required for Major: 2.50

Overall Minimum GPA Required for Graduation: 2.50

EFFECTIVE DATE: Fall 2019

GENERAL EDUCATION	33 S.H.
Foundation Requirements [1]	13 S.H.
GE 1000 Transition to Kean [2] *or* GE 3000 Transfer Transitions [2]	1
ENG 1030 College Composition [3]	3
MATH 1054 Precalculus [4]	3
COMM 1402 Speech Communication as Critical Citizenship	3
GE 2024 Research & Technology	3
Disciplinary & Interdisciplinary Distribution Requirements [1]	
Humanities	6 S.H.
ENG 2403 World Literature *	3
take one "GE Approved" course from one area below	
Fine Arts/Art History	3
Philosophy or Religion	3
Foreign Languages *(must take I and II for credit)*	3
Music or Theatre	3
Interdisciplinary	3
Social Sciences	6 S.H.
HIST 1062 Worlds of History *	3
take one "GE Approved" course from one area below	
Psychology	3
Economics or ES 1010 World Geography	3
Political Science	3
Sociology or Anthropology	3
Interdisciplinary	3
Science and Mathematics	8 S.H.
CPS 1231 Fundamentals of Computer Science **, [5]	4
Lab Science (BIO 1000, CHEM 1083, *or* PHYS 2091/95) [6]	4

ADDITIONAL REQUIRED COURSES **	29-30 S.H.
Lab Science II (BIO 1300, CHEM 1084, *or* PHYS 2092/96) [6]	4
TECH 2920 Computer Systems	3
ENG 3091 Technical Writing	3
MATH 2110 Discrete Structures	3
MATH 2415 Calculus I [4]	4
MATH 2416 Calculus II *or* MATH 2995 Matrix & Linear Algebra	3/4
MATH 2526 Applied Statistics I	3
MATH 3526 Applied Statistics II	3
MATH 3700 Big Data Computing	3

ACADEMIC MAJOR	44 S.H.
Major Core **	14 S.H.
CPS 2231 Computer Organization & Programming [5]	4
CPS 2232 Data Structures and Algorithms	4
CPS 2390 Computer Organization and Architecture	3
CPS 3250 Computer Operating Systems	3
Major Concentration **	15 S.H.
CPS 3500 Programming World Wide Web Servers	3
CPS 3740 Database Management Systems	3
CPS 4721 Data Mining Principles	3
CPS 4745 Visualization Design and Development [WE]	3
CPS 4802 AI Machine Learning Algorithms	3
Major Electives **, [7]	12 S.H.
CPS 3xxx or 4xxx	3
CPS 3xxx or 4xxx	3
CPS 3xxx or 4xxx or 5xxx	3
CPS 3xxx or 4xxx or 5xxx	3
Major Capstone **	3 S.H.
CPS 4951 CS Capstone *or* CPS 4961 Senior Research in CS	3

FREE ELECTIVES	13-14 S.H.
at least 50% must be 3000/4000 level	
(recommended: CPS 1996 Research Initiative for Freshmen) [8]	1
(recommended: CPS 2010 Career Education)	1
(recommended: CPS 3171/72/73 Internship in CS) [9]	1-6
(recommended: CPS 3291/92/93 Career Internship in CS) [9]	1-6

Special Notes:

[1] See pre-requisites and equivalencies (on page 2)

[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)

[3] ENG 1030 requires grade of C or higher

[4, 5, 6, 7, 8, 9] See notes (on page 2)

*GE Distribution course required of all students

**All Major courses, All Additional and supporting courses, including Capstone requires grade of C or higher

[WE] Writing Emphasis course

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 prior to registration. Students may be exempt from testing due to SAT scores or prior college work.

Prerequisites and Equivalencies for GE Foundations Courses

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
Equiv: ENG 1031/1032, ENG 1033/1034, ENG 1430, ENG 1620, ENG 1020, ENG 1400

MATH 1000 or 1010 or 1016 or 1030
Prereq: MATH 0901 if required by placement testing
Equiv of MATH 1000: MATH 1001/1002, MATH 1003/1004, MATH 1051

MATH 1044 or 1054
Prereq: MATH 0901 if required by placement testing and MATH 1000

COMM 1402
Prereq: CS 0412 if required by placement testing
ENG 1031/1032 or ENG 1033/1034 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 College of CLA
GE 2024 College of NAHS & NJCSTM & NWGC
GE 2025 SVPA & Michael Graves College
GE 2026 Undecided Majors and other special populations
Prereqs: CS 0412 if required by placement testing
ENG 1030 or equivalent
COMM 1402
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.

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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 may take up to two CPS 5xxx level graduate courses as Major Electives (NOTE: For any graduate course to be credited towards the M.S. in CIS graduate program, students must take additional credits in Major or Free Electives to total 120 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.

[9] **Optional Internship Course**

Students can take a maximum of 6 credits for CPS 3171/72/73 Internship in CS which may fulfill Free Electives requirements with the approval of the Departmental Advisory Committee. CPS 1996, CPS 2010, and CPS 3171/72/73 are CPS courses acceptable for use in Free Electives and are managed by the School of Computer Science and Technology. CPS 3291/92/93 Career Internship in CS are also 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 1054
MATH 2415 Calculus I	
MATH 2526 Applied Statistics I	
MATH 2416 Calculus II or MATH 2995 Matrix & Linear Algebra	MATH 2415
MATH 3700 Big Data Computing	
MATH 3526 Applied Statistics II	MATH 2526

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:

a) Minimum cumulative GPA of 2.5 at the time of declaration to the major.
b) Completion of at least 12 credits of CPS Major courses at Kean University with a grade of C or higher in each.

Your major department is located in North Avenue Academic Building, Room 233, Tel: 908-737-6150.