KEAN UNIVERSITY - N.J. CENTER FOR SCIENCE, TECHNOLOGY & MATHEMATICS

(30111) B.S. IN SCIENCE & TECHNOLOGY (NJIT Engineering Science Option) 120 S.H.

Minimum GPA Required for Major: 2.75
Overall Minimum GPA Required for Graduation: 3.0

EFFECTIVE DATE: FALL 2019

GENERAL EDUCATION: 34 Semester Hours (S.H.)			
Foundation Requirements[1,2]: 14 S.H.			
GE 1000	Transition to Kean[3] or GE 3000 Transfer Transtion[3]	1	
ENG 1030	College Composition[1]	3	
STME 2000 STME 2099	Math. & Comp. Methods of Science I[4] & Math. & Comp. Methods of Science I[4] Lab	3 1	
COMM 1402	Speech Communication As Critical Citizen[1]	3	
GE 2024	Research & Technology	3	
Disciplinary & Interdisciplinary Distribution Requirements[2]: 20 S.H.			
***Humanities*: 6 S.H.**			
*ENG 2403	World Literature	3	
*Take **ONE** GE Approved course from one area below*			
	Fine Arts/Art History, Philosophy or Religion, Foreign Languages (must take 1 & II for credit), Music or Theater, Interdisciplinary		
***Social Sciences*: 6 S.H.**			
*HIST 1062	Worlds of History	3	
*Take **ONE** GE Approved course from one area below*			
	Psychology, Economics or ES1010 (World Geo), Political Science, Sociology or Anthropology, Interdisciplinary		
***Science and Mathematics*: 8 S.H.**			
*STME 2100 *STME 2199	Math. & Comp. Methods of Science II & Math. & Comp. Methods of Science II Lab	3 1	
*STME 1000 *STME 1099	Chemical Systems I & Chemical Systems I Lab	3 1	
ADDITIONAL REQUIRED COURSES[1]: 13-17 S.H.			
MATH 3541	Calculus III	4	
MATH 3455	Differential Equations	3	
*Select **ONE** of the 3 options from below (refer to NJIT track requirements[7])*			
STME 1500 STME 1599 CPS 2231	Intro. Programming AND Intro. Programming Lab AND Computer Organization & Programming	3 1 4	
STME 2681 STME 2682	Organic Chemistry Honors Lecture I AND Organic Chemistry Honors Lecture II	3 3	
STME 2681 STME 2683 CHEM 3381 CHEM 3383	Organic Chemistry Honors Lecture I AND Organic Chemistry Honors Lab I AND Physical Chemistry Lecture I AND Physical Chemistry Lab I	3 2 3 2	

ACADEMIC MAJOR[5]: 61-70 S.H.			
Program Core Requirements[5]: 29 S.H.			
STME 3610	Current Issues	1	
STME 2700 STME 2799	Physical Systems I & Physical Systems I Lab	3 1	
STME 2800 STME 2899	Physical Systems II & Physical Systems II Lab	3 1	
PHYS 2097	Physics III	4	
STME 2300 STME 2399	Probabilistic Methods in Science & Probabilistic Methods in Science Lab	3 1	
STME 2200 STME 2299	Math. & Comp. Methods of Science III & Math. & Comp. Methods of Science III Lab	3 1	
STME 1100 STME 1199	Chemical Systems II & Chemical Systems II Lab	3 1	
STME 1700 STME 1799	Living Systems I & Living Systems I Lab	3 1	
NJIT Engineering Science Program Track Requirements[5,6]: 29-38 S.H.			
(Select core and concentration courses at NJIT based on track, see additional sheets)			
	General Engineering Science	33	
	Mechanical Engineering	37	
	Industrial Engineering	38	
	Electrical Engineering	33	
	Structural Engineering	36	
	Construction Engineering	34	
	Transportation Engineering	34	
	Chemical Engineering	36	
	Pharmaceutical Engineering	36	
	Biomedical Engineering	38	
	Computer Engineering	29	
****Major Capstone Course[5]: 3 S.H.**			
STME 4610	Science & Technology Seminar (WE)	3	
FREE ELECTIVES: 0-12 S.H. *(at least 50% must be 3000/4000 level; select w/advisement)*			

Special Notes:

All pre-requisites for major courses must be passed with a grade of C or better.

* GE Distribution course required of all students ** Course required by Major

[1] Foundation Requirements & Additional Required Courses require a grade of C or better, except ENG 1030 and COMM 1402 require B- or better.

[2] See prerequisites & equivalencies (on page 2).

[3] University Requirement for Graduation for all undergraduate students that must be satisfied in one of two ways: Complete GE 1000 (all freshmen & transfers entering with 0-29 credits) OR complete GE 3000 (transfers entering with 30 credits or more).

[4] Prerequisite of qualifying test score or the equivalent of MATH 1054.

[5] A minimum major GPA of 2.75 and minimum grade of C is required in all major courses, except major capstone requires a grade of B- or better.

[6] Engineering science and concentration electives to be selected based on concentration and in consultation with advisors at both NJIT and Kean. Two courses must be graduate level engineering courses taken at NJIT. Other courses may be taken at NJIT or Kean based on course availability and under direction of the academic advisor.

[7] Certain NJIT tracks require pre-requisite Kean coursework and the course option chosen should reflect these requirements (see pages 2-3 for Chemical, Biomedical & Pharmaceutical track requirements specifically)

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NJIT ENGINEERING SCIENCE PROGRAM TRACK REQUIREMENTS

General Engineering Science (33)	
Engineering Science Core (14)	
Mech 320 Statics and Strength of Materials	3
Mech 236 Dynamics	2
ECE 231 Circuits and Systems I	3
ME 304 Fluid Dynamics	3
ME 311 Thermodynamics	3
Concentration Courses (19)	
Selected with advisement, 6 credits must be at the graduate level	

Mechanical Engineering (37)	
Engineering Science Core (17)	
Mech 236 Dynamics	2
Mech 237 Strength of Materials	3
ME 311 Thermodynamics I	3
ME 304 Fluid Dynamics	3
ME 315 Stress Analysis	3
Mech 235 Statics	3
Concentration Courses (20)	
ME 231 Kinematics of Machinery	3
ME 407 Heat Transfer	3
ME 430 Introduction to Computer-Aided Design	3
ME 343 Mechanical Laboratory I	3
ME 215 Engineering Materials and Processes	2
2 additional courses to be selected with advisement at the graduate level	6

Industrial Engineering (38)	
Engineering Science Core (14)	
Mech 236 Dynamics	2
Mech 320 Statics and Strength of Materials	3
ME 311 Thermodynamics	3
ME 304 Fluid Dynamics	3
ECE 231 Circuits and Systems I	3
Concentration Courses (24)	
IE 339 Work Measurement and Standards	3
IE 355 Human Factors	3
IE 439 Deterministic Models in Operations Research	3
IE 440 Stochastic Models in Operations Research	3
IE 224 Production Processes	3
IE 334 Engineering Economy and Capital Investment	3
IE 604 Advanced Engineering Statistics	3
IE 618 Engineering Cost and Production Economics	3

Electrical Engineering (33)	
Engineering Science Core (12)	
ECE 271 Electronic Circuits I	3
ECE 231 Circuits and Systems I	3
ECE 232 Circuits and Systems II	3
ECE 251 Digital Design	3
Concentration Courses (21)	
ECE 252 Microprocessor	3
ECE 333 Signals and Systems	3
ECE 372 Electronic Circuits II	3
ECE 321 Random Signals and Noise	3
ECE 361 Electromagnetic Fields I	3
ECE 601 Linear Systems	3
ECE 673 Random Signal Analysis	3

Structural Engineering (36)	
Engineering Science Core (15)	
Mech 235 Statics	3
Mech 236 Dynamics	2
Mech 237 Strength of Materials	3
CE 320 Fluid Dynamics	3
CE 341 Soil Mechanics	3
CE 341A Soil Mechanics Lab	1
Concentration Courses (21)	
CE 210 Construction Materials and Procedures	3
CE 332 Structural Analysis	3
CE 333 Reinforced Concrete Design	3
CE 432 Steel Design	3
CE 443 Foundation Design	3
CE 639 Applied Finite Elements	3
CE 636 Stability of Structures	3

Construction Engineering (34)	
Engineering Science Core (15)	
Mech 235 Statics	3
Mech 236 Dynamics	2
Mech 237 Strength of Materials	3
CE 320 Fluid Dynamics	3
CE 341 Soil Mechanics	3
CE 341A Soil Mechanics Lab	1
Concentration Courses (19)	
CE 200 Surveying	3
CE 200A Surveying Lab	1
CE 210 Construction Materials and Procedures	3
ENE 262 Environmental Engineering	3
CE 350 Transportation Engineering	3
CE 610 Construction Management	3
CE 611 Project Planning and Control	3

Transportation Engineering (34)	
Engineering Science Core (15)	
Mech 235 Statics	3
Mech 236 Dynamics	2
Mech 237 Strength of Materials	3
CE 320 Fluid Dynamics	4
CE 321 Water Resources Engineering	3
Concentration Courses (19)	
CE 200 Surveying	3
CE 200A Surveying Lab	1
CE 210 Construction Materials and Procedures	3
ENE 262 Environmental Engineering	3
CE 350 Transportation Engineering	3
TRAN 615 Traffic Study and Capacity	3
TRAN 650 Urban Systems Engineering	3

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NJIT ENGINEERING SCIENCE PROGRAM TRACK REQUIREMENTS

Chemical Engineering (36)	
Engineering Science Core (14)	
Mech 320 Statics and Strength of Materials	3
ChE 210 Chemical Process Calculations I	2
ChE 210W Chemical Process Calculations I Workshop	0
ChE 230 Chemical Engineering Thermodynamics I	3
ChE 230W Chemical Engineering Thermodynamics I Workshop	0
ChE 240 Chemical Process Calculations II	3
ChE 240W Chemical Process Calculations II Workshop	0
ChE 260 Fluid Flow	3
Concentration Courses (22)	
ChE 342 Chemical Engineering Thermodynamics II	3
ChE 349 Kinetics and Reactor Design	3
ChE 360 Separation Processes I	3
ChE 370 Heat and Mass Transfer	4
ChE 396 Chemical Engineering Lab I	3
2 additional courses to be selected with advisement at the graduate level	6
Students should take one semester each of organic and physical chemistry with lab as part of their Kean coursework	

Pharmaceutical Engineering (36)	
Engineering Science Core (14)	
Mech 320 Statics and Strength of Materials	3
ChE 210 Chemical Process Calculations I	2
ChE 210W Chemical Process Calculations I Workshop	0
ChE 230 Chemical Engineering Thermodynamics I	3
ChE 230W Chemical Engineering Thermodynamics I Workshop	0
ChE 240 Chemical Process Calculations II	3
ChE 240W Chemical Process Calculations II Workshop	0
ChE 260 Fluid Flow	3
Concentration Courses (22)	
ChE 342 Chemical Engineering Thermodynamics II	3
ChE 349 Kinetics and Reactor Design	3
ChE 360 Separation Processes I	3
ChE 370 Heat and Mass Transfer	4
ChE 396 Chemical Engineering Lab I	3
PhEn 601 Principles of Pharmaceutical Engineering	3
PhEn 604 Validation and Regulatory Issues in the Pharmaceutical Industry	3
Students should take one semester each of organic and physical chemistry with lab as part of their Kean coursework	

Biomedical Engineering (38)	
Engineering Science Core (15)	
BME 302 Fundamentals of Biomechanics	3
BME 304 Fundamentals of Biomaterials	3
BME 301 Fundamentals of Bioelectronics	3
BME 351 Biofluid Dynamics	3
ME 311 Thermodynamics	3
Concentration Courses (23)	
BIO 3403 Anatomy and Physiology I (Kean course)	4
BIO 3404 Anatomy and Physiology II (Kean course)	4
BME 310 Biomedical Computing	3
2 additional BME courses to be selected with advisement at the undergraduate level	6
2 additional courses to be selected with advisement at the graduate level	6
Students should take two semesters of organic chemistry as part of their Kean coursework	

Computer Engineering (29)	
Engineering Science Core (12)	
ECE 271 Electronic Circuits I	3
ECE 231 Circuits and Systems I	3
ECE 232 Circuits and Systems II	3
ECE 251 Digital Design	3
Concentration Courses (17)	
ECE 252 Microprocessors	3
ECE 353 Computer Architecture & Organization	3
ECE 368 Signal Transmission	2
ECE 394 Digital Systems Lab	1
ECE 395 Microprocessor Lab	2
ECE 690 Computer Systems Architecture	3
ECE 698 Computer Arithmetic Algorithms	3

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

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 SFPA & 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.