

KEAN UNIVERSITY
The Dorothy and George Hennings College of Science, Mathematics, and Technology
(BIO/CELMO) B.S. Biology, Cell and Molecular Biology Option, 120 S.H.
Minimum GPA Required for Graduation: 2.0 ***

GENERAL EDUCATION: 31-32 S.H.¹		ACADEMIC MAJOR REQUIREMENTS: 49-50 S.H.¹	
Essential Learning Courses*: 16-17 S.H.		Major Required Courses**: 31 S.H.	
Critical Reading & Academic Study Skills	4	BIO 1300 General Biology I: Cell Biology and Genetics	4
<i>All students must take 1 credit in Academic Study Skills: either GE*1000 or GE*3000</i>	1	BIO 1400 General Biology II: Evolution, Biodiversity and Ecology	4
<i>All students must take 3 credits in Critical Reading from the GE PLO Course List.</i>	3	BIO 2910 Essentials of Bioinformatics	3
Written Communication²	3	BIO 3315 Principles of Microbiology	3
<i>All students must take 3 credits in Written Communication from the GE PLO Course List.</i>		BIO 3315L Principles of Microbiology Laboratory ⁷	1
Speech Communication	3	BIO 3709 Genetics	4
<i>All students must take 3 credits in Speech Communication from the GE PLO Course List.</i>		BCHM 4115 Biochemistry	3
Quantitative & Scientific Reasoning³	6-7	BCHM 4115L Biochemistry Laboratory (W-E) ⁷	1
<i>All students must take either MATH*1016 or MATH*1054 (3 credits each).</i>	3	BIO 4316 Immunology	3
<i>All students must take 3 or 4 credits in Scientific Reasoning from the GE PLO course list.</i>	3-4	BIO 4316L Immunology Laboratory ⁷	1
Core Competency Courses: 12 S.H.		Select ONE (remaining two may be taken as part of Major Electives), 4 S.H.	BIO 4236 Cell Physiology BIO 4236L Cell Physiology Laboratory ⁷ BIO 4325 Applied Microbiology BIO 4700 Molecular Genetics
Intercultural Knowledge & Understanding	3		3 1 4 4
<i>All students must take 3 credits in Intercultural Knowledge & Understanding from the GE PLO Course List.</i>			
Critical & Creative Thinking	3		
<i>All students must take 3 credits in the Critical & Creative Thinking from the GE PLO Course List.</i>		Major Electives Courses**: 15-16 S.H.	
Ethical Reasoning	3	BIO courses intended for Biology majors at 2000-4000 level are eligible as Major Electives. ^{1,8}	
<i>All students must take 3 credits in Ethical Reasoning from the GE PLO Course List.</i>		At least 50% must be at 3000-4000 level.	
Wellness	3		
<i>All students must take 3 credits in Wellness from the GE PLO Course List.</i>		Major/GE Capstone Course**: 3 S.H.	
Inquiry & Analysis Passion Project: 3 S.H.	3	BIO 4790 Seminar Integrative Biology	3
<i>All students must take 3 credits in Inquiry & Analysis from the GE PLO Course List.</i>		Free Electives****,9: 7-12 S.H.	
Additional Required Courses****,4: 27-31 S.H.		At least 50% must be at 3000-4000 level.	
MATH 1016 Statistics or MATH 1054 Precalculus ^{5,6} (if not completed in GE)	3		
MATH 2415 Calculus I ⁵	4		
CHEM 1083 Chemistry I ⁶ (if not completed in GE)	4		
CHEM 1084 Chemistry II ⁶ (if not completed in GE)	4		
CHEM 2581 Organic Chemistry I ^{6,7}	3		
CHEM 2581L Organic Chemistry Laboratory I ^{6,7}	1		
CHEM 2582 Organic Chemistry II ^{6,7}	3		
CHEM 2582L Organic Chemistry Laboratory II ^{6,7}	1		
PHYS 2091 General Physics I ⁶ or PHYS 2095 Physics I	4		
PHYS 2092 General Physics II or PHYS 2196 Physics II	4	See page 3 for superscript information	

GENERAL EDUCATION AND UNIVERSITY REQUIREMENTS

GENERAL EDUCATION INFORMATION AND REQUIREMENTS

Testing and Placement

Incoming freshmen and transfer students may be placed in specific GE Essential Learning, 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 Essential Learning Courses

GE*1000

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

Pre-requisite: None

Equivalency: ID*1001

GE*3000

Required of transfers entering with 30 credits or more

Pre-requisite: 30 credits and ENG*1030 (or equivalent)

ENG*1030

Pre-requisite: Placement testing or exemption from placement testing

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

MATH*1016

Pre-requisite: MATH*0901 if required by placement testing

Co-requisite: MATH*0902 should be taken concurrently with Math*1016 if required by placement testing

MATH*1054

Pre-requisite: MATH*0901 if required by placement testing and MATH*1000

COMM*1402

Pre-requisite: ENG*1031/1032 or ENG*1033/1034 if required by placement testing; May be taken concurrently with ENG*1030

Equivalency: COMM*1400

Inquiry & Analysis PLO

GE 2021- 2026: *Research and Technology* is offered as a college-based course.

Pre-requisite: CS*0412 if required by placement testing; Written Communication course

Equivalency: GE*2020

GE*2021: College of Business and Public Management

GE*2022: College of Education & College Health Professions and Human Services

GE*2023: College of Liberal Arts

GE*2024: College of Science, Mathematics, and Technology & College Health Professions and Human Services

GE*2025: Departments of Fine Arts, Music, and Theatre & Michael Graves College

GE*2026: Undecided Majors and other special populations

GE PLO Courses

Approved GE PLO Course List

All courses taken under the General Education Essential Learning and Core Competency requirements must be selected from the Approved General Education PLO Course List.

Foreign Language Credit

The three credits for a foreign language that may satisfy the GE Intercultural Knowledge & Understanding 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 an elective.

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

To graduate, all students are required to complete at least one "Writing Emphasis" course within their major. Such courses are designed to provide students with an opportunity to explore writing as it is done in their chosen field. Typically, Writing Emphasis courses are taken in the junior or senior year, after the student's initial composition courses are completed. Students should consult their major program advisor for specific information about the Writing Emphasis course requirement.

Special Notes:

* GE required courses

**All major courses require a grade of C or better

*** Most graduate programs require candidates to have a minimum GPA of 3.0

**** The number of credits for Free Electives will vary, depending on how many "Additional Required Courses" were taken under the GE categories.

¹ See Prerequisites & Equivalencies (below and current course catalog).

² ENG 1030 requires a grade of C or higher

³ Students in this major are strongly advised to take MATH 1054 and CHEM 1083, because these are the courses that serve as pre-requisites for advanced courses. MATH 1054 is a pre-requisite for MATH 2415 and co-requisite for BIO 1300 and CHEM 1083. CHEM 1083 is a prerequisite for CHEM 1084 (which must be followed by CHEM 2581, and CHEM 2582). Completing these courses early will help you stay on track for timely graduation.

⁴ Students in this program are required to complete both MATH 1054 and MATH 1016. One of these courses will fulfill a General Education requirement, while the other will apply toward the Additional Required Courses category. In addition, one course from the Additional Required Courses list (for example, CHEM 1083) may also satisfy a General Education requirement. If this occurs, students must take a free elective of equal credit value to ensure they meet the 120-credit requirement for graduation.

⁵ With qualifying placement test scores, this course may be substituted with an elective

⁶ Requires a grade of C or higher

⁷ Lecture course must be taken concurrently or prior to the corresponding lab.

⁸ BIO 2402-04 are excluded from major electives because they are designated as non-major courses. Please confirm your eligible major electives with your academic advisor and by reviewing the official course catalog.

⁹ Maximum of 2 credits for BIO 1996 (Intro to Biological Research) or BIO 3900 (Research Experience in Biology) are allowed. BIO 3291-93 (Internship) is also an optional course. These courses are optional and counted as free electives.

Course Prerequisites (confirm the current prerequisites in the course catalog)

BIO 1300: MATH 1000, Corequisite MATH 1054

BIO 1400: BIO 1300

BIO 2500: BIO 1300

BIO 2910: BIO 1400

BIO 3260: BIO 1400

BIO 3315 and 3315L: BIO 1400

BIO 3400: BIO 1400, CHEM 1084

BIO 3403: BIO 1400, CHEM 1084, GE 2024

BIO 3404: BIO 3403

BIO 3614: BIO 1400, MATH 1016

BIO 3709: BIO 1400

BIO 4236 and 4236L: BIO 3709

BIO 4316 and 4316L: 16 credits of Biology which must include BIO1400

BIO 4325: BIO 3315 and BIO 3315L

BIO 4700: BIO 3709

BCHM 4115 and 4115L: CHEM 2582

BIO 4970: 20 credits of biology plus senior biology major status

CHEM 1083: MATH 1000; Corequisite MATH 1054

CHEM 1084: MATH 1054, CHEM 1083 with grade of C or better

CHEM 2581 and 2581L: CHEM 1084 with grade of C or better

CHEM 2582 and 2582L: CHEM 2581 with grade of C or better

MATH 2415: MATH 1054 with grade C or better

PHYS 2091: MATH 1054 with grade C or better

PHYS 2092: PHYS 2091

PHYS 2095: MATH 2415; Corequisite MATH 2416

PHYS 2096: PHYS 2095 and MATH 2412