Assessment Plan

B.A./B.S. in BIOLOGY
School of Natural Science
College of Natural Science and Applied Health
Kean University

Mission:

The mission of the Biology program, in support of and aligned with the missions of the University and College, is to provide a broad and challenging curriculum in the biological sciences. This curriculum prepares students for an extensive spectrum of careers in the life and health sciences. Students are immersed in an integrated curriculum of scientific concepts and principles and master modern technological laboratory skills. The curriculum provides a strong foundation in classical and modern biology and prepares students to be lifelong learners ready to meet the challenges of an ever-changing global society.

The program also provides preparation in elementary or secondary school teaching, in life science positions for industry and government, and post graduate studies in biology and allied health professions. The program offers opportunities for significant research experience to interested and qualified students. In addition, students in this major are prepared to pursue the graduate and/or joint degrees in Occupational Therapy, Physical Therapy, Podiatric Medicine, Medical Technology, Health Information Technology, and Physician Assistant programs through articulation agreements with other institutions.

The School of Natural Sciences also serves as the liaison for the joint B.S. degree in Health Information Management (HIM) with UMDNJ. This program prepares students to become competent registered HIM administrators for employment in all types of health care facilities.

Assessment Process B.A. Biology:

The B. A. degree in Biology has six (6) core courses as part of the requirements for the major. These six core courses provide a sound backbone of the discipline with regard to the research and theoretical aspects of Biology as well as the various areas of study within these fields. As such, these core courses are the primary vehicle for assessing the knowledge of our students. Beyond the core courses, students take at least two other elective courses. The faculty have agreed to center our assessment on the core knowledge of Biology within the six core courses.

Assessment Process B.S. Medical Technology:

The B.S. degree in Medical Technology has eight (8) core courses as part of the requirement for the major. These eight core courses provide a sound backbone of the discipline with regard to the research and theoretical aspects of clinical laboratory science. As such, these core courses are the primary vehicle
for assessing the knowledge of our students. Beyond the core courses, students take five (5) courses in chemistry. The assessment for this major will focus on the eight core courses and faculty have agreed to center our assessment on the core knowledge of Biology.

**Assessment Process B.S. Health Information Management:**

During their freshman and sophomore years at Kean students take pre-profession courses in General Education and five required core courses. Then they apply to UMDNJ for the Professional courses during their junior and senior years. Of the five core courses only one (BIO 2402 *Human Physiology and Anatomy*) is managed and assessed by the School of Natural Sciences. The other four courses are assessed by the following programs: Accounting (ACCT 2200), Management (MGS 2030), Mathematics (MATH 1016) and Computer Science (CPS 1032 or CPS 1231). Therefore, assessment of this major will be for BIO 2402 and we will work on assessment issues with the other departments at Kean and the HIM faculty at UMDNJ.

Each core course has assessment tools such as exams, research and reflective writing assignments, portfolio work, and group work products as part of the evaluation process and the program has used results of assessment for making improvements to program practices aimed at increasing student learning. For example, inadequate preparation for upper level (3000 level) core courses led the Biology Department to go from one introductory course (BIO 1000) to a two course sequence BIO 2200 and BIO 2400, *Cell Biology* and *Genes, Organisms and Populations* respectively. At UMDNJ specific deficiencies in understanding of certain topics have been noted within the program as course assignments and exercises are utilized. In addition, an evaluation of comprehensive exam results and national credentialing results demonstrates that students have areas of weakness that need to be reinforced. Also, students have reported through feedback surveys, that those not in the medical coding track do not feel they possess the level of skill needed to successfully complete the coding portion of the national exam.

A standardized comprehensive Educational Testing Service (ETS) Biology exam is taken by all students in the capstone course (BIO 4970, *Seminar in Integrative Biology*). This test has been identified as a direct measure for assessing attainment of two of our program Student Learning Outcomes, content knowledge and analytical skills. In addition many of our biology teacher education majors take the PRAXIS II exam. Assessment data collected from these tests collectively provide the evidence of meeting program goals. Each semester, composite data from scored student exam results are collected and analyzed to address areas of program strengths and weaknesses and to inform our decisions ultimately resulting in program improvements. In addition, a systematic process for gathering data utilizing an indirect measure, the Graduating Student Survey, was established. Data from the student survey will also help inform our decisions regarding program improvement to increase student learning. At UMDNJ, in order to address competency deficiencies three new courses are being introduced. These courses not only assist students in achieving the desired credentials, but also provide them with the skills and knowledge that are essential in being a successful health information professional.

**Program Student Learning Outcomes (SLOs) – as aligned with KU SLOs derived from the Institutional Mission* and GE SLOs.** (Data from Direct and Indirect Measures collected each semester in the Capstone Course or a designated, end-of-program course.)
Students who graduate with a B.A. degree in Biology B.S. degree in Medical Technology, and B. S. degree in HIM should be able to:

**SLO1: Acquire** the knowledge of fundamental concepts and principles which characterize living organisms and biological functions.

**Direct Measure:** BIO 4970: Research paper scored with rubric to demonstrate achievement of program goals. **Indirect Measure:** Program Completer Survey (KU 1, 2, 4) (GE K1, S5, V1)

**SLO2: Acquire** the laboratory and field skills to gather and analyze data related biological questions.

**Direct Measure:** BIO 4970: Research paper scored with rubric to demonstrate achievement of program goals. **Indirect Measure:** Program Completer Survey (KU 1, 2, 4) (GE K1, S3, S4, S5, V2)

**SLO3: Develop** skills in critical thinking, scientific reasoning, and problem solving.

**Direct Measure:** BIO 4970: Research paper scored with rubric to demonstrate achievement of program goals. **Indirect Measure:** Program Completer Survey (KU 1, 2, 4) (GE K2, S1, S3, S4, S5, V1)

**SLO4: Develop** the ability to apply biological principles to understand current issues.

**Direct Measure:** BIO 4970: Research paper scored with rubric to demonstrate achievement of program goals. **Indirect Measure:** Program Completer Survey (KU 1, 2, 3, 4) (GE K1, S3, S4, S5, V1, V3)

**SLO5: Develop** the ability to effectively find, organize and use resources from the literature and present results in oral, visual and written communication.

**Direct Measure:** BIO 4970: Research paper scored with rubric to demonstrate achievement of program goals. **Indirect Measure:** Program Completer Survey (KU 1, 2, 4) (GE K1, S1, S2, S3, S4, S5, V1)

**SLO6: Develop** an awareness of careers and professions available in the biological sciences

**Direct Measure:** BIO 4970: Research paper scored with rubric to demonstrate achievement of program goals. **Indirect Measure:** Program Completer Survey (KU 2, 3, 4GE S4, S5, V4, V5)

**SLO7:** Acquire adequate preparation to enter health professional programs and/or the work force in related fields.

**Direct Measure:** An on-line survey will be used to assess the equivalent educational outcome for students admitted into joint Health Professional Programs. **Indirect Measure:** Program Completer Survey (KU 2, 3, 4) (GE K1, K4, S5, V4, V5)
* KU Student Outcomes: *Kean University graduates should be able to:*
1. Think critically, creatively and globally;
2. Adapt to changing social, economic, and technological environments;
3. Serve as active and contributing members of their communities; and
4. Advance their knowledge in the traditional disciplines (GE) and enhance their skills in professional areas.

1. **General Education Student Learning Outcomes**

   *Student Learning Outcomes – Knowledge:* Students will demonstrate proficiency in knowledge and content by:
   (K1) applying the scientific method to understand natural concepts and processes;
   (K2) evaluating major theories and concepts in social sciences;
   (K3) relating historical references to literature; and
   (K4) evaluating major theories and concepts in the fine arts.

   *Student Learning Outcomes – Skills:* Students will demonstrate the skills necessary to:
   (S1) write to communicate and clarify learning;
   (S2) communicate effectively through speech;
   (S3) solve problems using quantitative reasoning;
   (S4) think critically about concepts in multiple disciplines; and
   (S5) show information literacy.