ASSESSMENT PLAN
NJ Center for Science, Technology & Mathematics (NJCSTM)

B.S./M.S. Sci & Tech / Molecular Biology - Biotechnology Statements

The vision of the B.S./M.S. Science & Technology / Molecular Biology-Biotechnology program offered by the NJ Center for Science, Technology & Mathematics (NJCSTM) is to advance a reputation as a leading program to train scientist-researchers by both the exemplary skills of our students and faculty and the involvement of professionals to partner with NJCSTM. The mission of this five year, combined degree program is to train students to take their place in a multi-disciplinary science workforce that requires a broad base of fundamental knowledge, concentrated knowledge within one’s discipline, and the ability to make connections between disciplines. A driving goal of this program is to train professionals in biotechnology with both highly developed practical laboratory skills and critical thinking skills and with the potential to further their professional development as scientific technologies advance.

B.S./M.S. Sci & Tech / MolBio-Biotech Student Learning Outcomes (SLOs)

NOTES:
SWR = scored with rubric
2011-12 SLO#6 was merged with SLO#2 as both encompassed aspects of holistic knowledge

For the Student Earning a B.S./M.S. Degree in the Molecular Biology - Biotech Option

It is our expectation that graduates from the NJCSTM will have these characteristics:

- **SLO1** (Applied Knowledge): Graduates will be strong candidates who may continue their education by pursuing doctoral degrees in related fields of study or otherwise seek career employment in the sciences. (KU 1, KU 2, KU 3, KU 4) (GE V5)
  - **4 Direct Measures**: GRE general exam score; Presentation scored with rubric (SWR, STME 4610); Lab practical SWR (STME 5140); Paper and oral presentation SWR (STME 5410-15)
  - **1 Indirect Measure**: Graduating Student Survey

- **SLO2** (Holistic Knowledge): Graduates will be versatile and resourceful scientist-researchers who can adjust to this ever-changing field because of their comprehensive, integrated knowledge of applied mathematics, chemistry/physics and biology, and of the origins of biotechnology in biology and chemistry as well as in society. (KU 1, KU 2, KU 3, KU 4) (GE K1, S3, S4, S5, V2, V4)
  - **4 Direct Measures**: Lab practical SWR (STME 1603); Poster SWR (STME 3610); Presentation SWR (STME 4610); Paper SWR (STME 5410-15)
  - **1 Indirect Measure**: Graduating Student Survey

- **SLO3** (Critical Thinking): Graduates will be able to combine critical thinking skills, analytical knowledge and practical laboratory skills to design, perform, and analyze scientific problems
both as an individual and as effective and productive project team members. (KU 1, KU 3, 
KU 4) (GE K1, S3, S4, S5)

- **5 Direct Measures:** Lab practical SWR (STME 1603); Poster SWR (STME 3610); 
  Presentation SWR (STME 4610); Lab practical SWR (STME 5140); Paper and presentation 
  SWR (STME 5410-15)
- **1 Indirect Measure:** Graduating Student Survey

- SLO4 (Ethics): Graduates will have adequate knowledge of the bioethical standards of the 
  science profession and be able to exercise ethical awareness. (KU 1, KU 3) (GE K1, S4, V2)
  - **2 Direct Measures:** Paper and presentation SWR (GE 2024); Certification of completion 
    of National Institute of Health (NIH) training course on human participants in research 
    (STME 5020).
  - **1 Indirect Measure:** Graduating Student Survey

- SLO5 (Communication): Graduates will be able to verbally express themselves and 
  communicate scientific comprehension and knowledge in both formal oral presentations and 
  in written format clearly, concisely and accurately. (KU 1, KU 3) (GE S1, S2, S3, S4, S5, 
  V4)
  - **4 Direct Measures:** Paper and presentation SWR (GE 2024); Poster SWR (STME 3610); 
    Presentation SWR (STME 4610); Paper and presentation SWR (STME 5410-15)
  - **1 Indirect Measure:** Graduating Student Survey

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**MolBio - Biotech Program SLOs – as aligned with KU SLOs derived from the Institutional 
Mission* and GE SLOs.** Data from Direct and Indirect Measures collected each spring 
semester in the Capstone/Culminating Course.

* 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.

**General Education Student Learning Outcomes**

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

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

**Values:** Students will exhibit a set of values that demonstrates:

(GE V1) personal responsibility
(GE V2) ethical and social responsibility
(GE V3) social and civic engagement
(GE V4) respect for diverse cultures and perspectives
(GE V5) life-long learning