

## Academic Assessment Report - AY 2012-2013 (FA12 + SP13)

College, School/Department, Name of Program:

NJCSTM BS SCI & TECH / Molecular Biology Option + MS SCI & TECH / Biotechnology Option

***NOTE: AY 12/13 had the following enrolled in this degree option: 2 students Year 5 (2 others had left Kean after their bachelor's degree to pursue Ph.D. degrees); 6 students Year 4; 3 students Year 3 (1 other was dismissed for low academic performance); 2 students Year 2; 6 students Year 1 (1 other was dismissed for low academic performance). The information contained herein is reported in the context of total enrollment in the common courses that students in this option take in common with the other NJCSTM program options (STME 4610, 1603, 3610, GE 2024) as well as the courses that year 4/5 students in this option take in common with the NJCSTM MS Biotech program (STME 5140, 5410-15, 5020). The GSS (graduating student survey) was compared for those in year 4 vs year 5 of this 5 year option.***

**Program SLOs:**

*(List Program SLOs)*

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)

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 its importance in society. (KU 1, KU 2, KU 3, KU 4) (GE K1, S3, S4, S5, V2, V4)

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)

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)

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)

**\* Note, 2011-2012 SLO # 6 merged with SLO # 2 as both encompassed aspects of holistic knowledge**

<b>Program Level Student Learning Outcomes</b> <i>(Add rows for additional SLOs)</i>	<b>Assessment Measure(s)</b> <i>(Add rows if necessary)</i>	<b>Assessment Criteria</b> <i>(Describe how data is collected--rubric, survey, etc.)</i>	<b>Results of Assessment</b> <i>(Specific to Data Collected)</i>	<b>Action Taken</b> <i>(Closing the Loop: New action or follow up from last Assessment Report)</i>
<b>SLO #1</b> <b>(Applied Knowledge)</b>	Direct Measure 1:	STME 4610 GRE general score	For research track seniors, only 1 missed next year's minimum score needed for verbal by 1 point; only 2 missed it for quants by 5 & 8 points respectively.	This year's seniors not yet held to the NJCSTM established minimum GRE scores, but SP14 seniors will be and it will be enforced hence creating incentive for preparation early on.
	Direct Measure 2:	STME 4610 Presentation SWR (Scored With Rubric)	Rubrics average scores that were subpar related to critical thinking as while problem statements were generally clearly defined, students showed some deficiencies in clearly identifying consequences and implications. Repeated in-class short talks and peer-reviewed practice talks resulted in generally satisfactory final presentations (oral delivery & visual aids).	Revise rubrics to distinguish between applied and integrated knowledge and in SP14 course work with students to identify consequences of results and the need for them to reflect on their own hypotheses.
	Direct Measure 3:	STME 5140 Lab Practical SWR	Lab practical rubric assessment for applied knowledge score average was 10.5 / 12 for 88%	No action needed.
	Direct Measure 4:	STME 5410-15 Paper and oral presentation SWR	Students' average score on rubric for assessing written project paper was 90 % (however rubric for written paper is less than ideal); for oral presentation on project was 82 %.	Encourage PIs of student master's projects to rehearse the oral talks with their students. Have AY 2013/14 see the full implementation of the new rubric for assessing written project papers that was piloted SP13 in STME 5400 be used in STME 5410-15.
	Indirect Measure:	Graduating Student Survey	The May 2013 GSS had 4 bachelor respondents & 2 master's respondents in this program option. Students	Work to increase participation of graduating students to complete the GSS perhaps by including it in the course syllabi for culminating courses.

			report high satisfaction with their academic experience including agreement in terms of program meeting SLOs.	
<b>SLO #2 (Holistic Knowledge)</b>	Direct Measure 1:	STME 1603 Lab Practical SWR	Lab practical rubric class average on “read & interpret” was 2.9 (scale of 0 to 5); “correct code” 3.14; and “create code “ 3.5.	Freshmen students show deficiencies in their ability to read & interpret code. Next academic year need to increase focus to stress reading & correcting complex codes over creation of simple codes.
	Direct Measure 2:	STME 3610 Poster SWR	Rubrics suggest that students need to place greater emphasis on critical thinking, in particular supporting their conclusions based on evidence, & also reflecting on their assumptions.	Rubrics must be revised to distinguish between applied knowledge vs. content knowledge vs. holistic knowledge.
	Direct Measure 3:	STME 4610 Presentation SWR	Rubrics average scores that were subpar related to critical thinking as while problem statements were generally clearly defined, students showed some deficiencies in clearly identifying consequences and implications. Repeated in-class short talks and peer-reviewed practice talks resulted in generally satisfactory final presentations (oral delivery & visual aids).	Revise rubrics to distinguish between applied and integrated knowledge and in SP14 course work with students to identify consequences of results and the need for them to reflect on their own hypotheses.
	Direct Measure 4:	STME 5410-15 Paper SWR	Students’ average score on rubric for assessing written project paper was 90 % (however rubric for written paper is less than ideal).	Have AY 2013/14 see the full implementation of the new rubric for assessing written project papers that was piloted SP13 in STME 5400 be used in STME 5410-15.

	Indirect Measure:	Graduating Student Survey	The May 2013 GSS had 4 bachelor respondents & 2 master's respondents in this program option. Students report high satisfaction with their academic experience including agreement in terms of program meeting SLOs.	Work to increase participation of graduating students to complete the GSS perhaps by including it in the course syllabi for culminating courses.
<b>SLO #3 (Critical Thinking)</b>	Direct Measure 1:	STME 1603 Lab Practical SWR	Lab practical rubric class average on "read & interpret" was 2.9 (scale of 0 to 5); "correct code" 3.14; and "create code " 3.5.	Freshmen students show deficiencies in their ability to read & interpret code. Next academic year need to increase focus to stress reading & correcting complex codes over creation of simple codes.
	Direct Measure 2:	STME 3610 Poster SWR	Rubrics suggest that students need to place greater emphasis on critical thinking, in particular supporting their conclusions based on evidence, & also reflecting on their assumptions.	Rubrics must be revised to distinguish between applied knowledge vs. content knowledge vs. holistic knowledge.
	Direct Measure 3:	STME 4610 Presentation SWR	Rubrics average scores that were subpar related to critical thinking as while problem statements were generally clearly defined, students showed some deficiencies in clearly identifying consequences and implications. Repeated in-class short talks and peer-reviewed practice talks resulted in generally satisfactory final presentations (oral delivery & visual aids).	Revise rubrics to distinguish between applied and integrated knowledge and in SP14 course work with students to identify consequences of results and the need for them to reflect on their own hypotheses.
	Direct Measure 4:	STME 5140 Lab Practical SWR	Lab practical rubric for assessing critical thinking average score was 9.1 / 12	Discuss with MS Biotech program coordinator ways in which critical thinking can be addressed in STME 5140 instructor

			for a 76 %	as well as STME 5170 instruction.
	Direct Measure 5:	STME 5410-15 Paper and oral presentation SWR	Students' average score on rubric for assessing written project paper was 90 % (however rubric for written paper is less than ideal); for oral presentation on project was 82 %.	Encourage PIs of student master's projects to rehearse the oral talks with their students. Have AY 2013/14 see the full implementation of the new rubric for assessing written project papers that was piloted SP13 in STME 5400 be used in STME 5410-15.
	Indirect Measure:	Graduating Student Survey	The May 2013 GSS had 4 bachelor respondents & 2 master's respondents in this program option. Students report high satisfaction with their academic experience including agreement in terms of program meeting SLOs.	Work to increase participation of graduating students to complete the GSS perhaps by including it in the course syllabi for culminating courses.
<b>SLO #4 (Ethics)</b>	Direct Measure 1:	GE 2024 Paper and presentation SWR	Annotated bibliography plagiarism score was 21%, but after in-class training, it dropped to 10 % for rough draft then 9 % for final draft review paper. The % is the similarity scored determined by turnitin.com hence the low score post training is acceptable due to software constraints.	No action needed.
	Direct Measure 2:	STME 5020 Certificate of completion of NIH training course on human participants in research	All enrolled students in the Bioethics course submitted satisfactory completion of the NIH training online.	No action needed.
	Indirect Measure:	Graduating Student Survey	The May 2013 GSS had 4 bachelor respondents & 2 master's respondents in this program option. Students report high satisfaction with their academic experience	Work to increase participation of graduating students to complete the GSS perhaps by including it in the course syllabi for culminating courses.

			including agreement in terms of program meeting SLOs.	
<b>SLO #5 (Communication)</b>	Direct Measure 1:	GE 2024 Paper and presentation SWR	For written paper rubric scores were acceptable, even the lower scores seen in “Genre/Audience” (3.63/5.0) & “Grammar/Mechanics” (3.75/5.0). For the oral presentation rubric, all averaged scored were acceptable, with the lowest seen in “Fluency” (3.57/5.0).	ForSP14, GE 2024 instructor will change to use of Grademark feature in Turnitin.com for correcting the rough drafts and affording more analysis of student writing.
	Direct Measure 2:	STME 3610 Poster SWR	Rubrics suggest that students need to place greater emphasis on critical thinking, in particular supporting their conclusions based on evidence, & also reflecting on their assumptions.	Rubrics must be revised to distinguish between applied knowledge vs. content knowledge vs. holistic knowledge.
	Direct Measure 3:	STME 4610 Presentation SWR	Rubrics average scores that were subpar related to critical thinking as while problem statements were generally clearly defined, students showed some deficiencies in clearly identifying consequences and implications. Repeated in-class short talks and peer-reviewed practice talks resulted in generally satisfactory final presentations (oral delivery & visual aids).	Revise rubrics to distinguish between applied and integrated knowledge and in SP14 course work with students to identify consequences of results and the need for them to reflect on their own hypotheses.
	Direct Measure 4:	STME 5410-15 Paper and oral presentation SWR	Students’ average score on rubric for assessing written project paper was 90 % (however rubric for written	Encourage Pls of student master’s projects to rehearse the oral talks with their students. Have AY 2013/14 see the full implementation of the new rubric for

			paper is less than ideal); for oral presentation on project was 82 %.	assessing written project papers that was piloted SP13 in STME 5400 be used in STME 5410-15.
	Indirect Measure:	Graduating Student Survey	The May 2013 GSS had 4 bachelor respondents & 2 master's respondents in this program option. Students report high satisfaction with their academic experience including agreement in terms of program meeting SLOs.	Work to increase participation of graduating students to complete the GSS perhaps by including it in the course syllabi for culminating courses.