Name: LTC Matthew Armstrong Date: 25AUG2021

2021 Faculty Surveys

This is our annual faculty program assessment survey for academic year 2021 (2020-2021). The survey is required for all chemical engineering faculty members and is **very important** for our program assessment and future re-accreditation effort in 2026. The survey does three things. First, it documents that you have been made aware of the performance of our cadets on our program's student outcomes. Second, it serves to document your opinions of that performance. Third, it allows us to use your collective knowledge and experience to identify areas where we might need improvement. Thus, the completed surveys are your collective "thumbs up or down" to the various performance indicators we are tracking.

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- Add your digital signature in the space below:

ARMSTRONG.MATTHEW.JOHN.1027486980 Digitally signed by ARMSTRONG.MATTHEW.JOHN.1027486980 Date: 2021.08.25 07:47:54 -04'00'

Name: LTC Matthew Armstrong Date: 25AUG2021

The mission of the chemical engineering program is to prepare commissioned leaders of character who are proficient in applying chemical and engineering principles to solve problems in a complex operational environment.

Chemical Engineering Program Objectives: During a career as commissioned officers in the United States Army and beyond, program graduates:

- Demonstrate effective leadership and chemical engineering expertise.
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- Succeed in graduate school or other advanced study programs.
- Advance their careers through clear and precise technical communication.

Chemical Engineering General Program Outcomes (Outcomes 1-7): On completion of the chemical engineering program, our graduates demonstrate an ability to:

- [Student Outcome 1] Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- Communicate effectively with a range of audiences.
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- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

Chemical Engineering Curriculum Outcomes (Outcome 8): The program provides the graduate with a thorough grounding and working knowledge of the chemical sciences, including:

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- Thermodynamics of physical and chemical equilibria
- Heat, mass, and momentum transfer
- Chemical reaction engineering
- Continuous and staged separation operations
- Process dynamics and control
- Modern experimental and computing techniques
- Process design

Name: LTC Matthew Armstrong Date: 25AUG2021

Part I. Student Outcomes. Review the data and then check the box in the column that most closely represents your opinion.

The cadets in the program are able to:	Strongly Disagree		Neutral		Strongly Agree
• Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	☐	☐	☐	☐	☒
• Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	☐	☐	☐	☐	☒
• Communicate effectively with a range of audiences.	☐	☐	☐	☒	☐
• Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	☐	☐	☐	☐	☒
• Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	☐	☐	☐	☐	☒
• Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.	☐	☐	☐	☐	☒
• Acquire and apply new knowledge as needed, using appropriate learning strategies.	☐	☐	☐	☐	☒
• Have attained a thorough grounding in and working knowledge of the chemical engineering curriculum.	☐	☐	☐	☐	☒

Name: LTC Matthew Armstrong Date: 25AUG2021

Part II. Program Objectives. Check the box that most closely represents your opinion.

	Strongly Disagree		Neutral		Strongly Agree
The program objectives are consistent with the USMA mission.	☐	☐	☐	☐	☒
The program objectives are consistent with the needs of the Army.	☐	☐	☐	☐	☒
The program curriculum supports the program objectives.	☐	☐	☐	☐	☒
The student outcomes are consistent with the program mission and objectives.	☐	☐	☐	☐	☒
The program has a process for periodically assessing the achievement of its student outcomes.	☐	☐	☐	☐	☒
The survey methods used by the program are effective.	☐	☐	☐	☐	☒
The cadets in the program are aware of the program objectives.	☐	☐	☐	☐	☒
The cadets are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒
The cadets are satisfied with the courses in the program.	☐	☐	☐	☒	☐
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒

Name: LTC Matthew Armstrong Date: 25AUG2021

Part III. Open Questions.

Are we teaching the right classes? Based on the assessment data or on your personal opinion, is there a course or content area that the program should add to the curriculum?
The chemical engineering program at USMA is teaching the right classes. There is not any course content that is required to be added. However, I would like to see additional and appropriate electives for our chemical engineers offered withing the Department, for example numerical methods of chemical engineering, bioengineering electives, etc.

Are we asking the right questions? Do you have any suggestions to improve the faculty survey for next year?
Perhaps we should ask more nuanced questions about the chemical engineers writing abilities, etc. Try to dig a bit deeper on the results of the Significant Writing Event (SWE)...that is perhaps currently buried in the MC312 results. We may be able to use the SWE results of our students to enhance our understanding of the chemical engineers technical writing ability.

Please add any additional comments that you would like to make below.
Perhaps moving forward the chemical engineering program can assess our cadets in CH459 for the SWE. Allow the cadets to stay in teams of 2-3 for the data; but then write their own lab document. This would allow us to manage the process for our chemical engineering cadets here in our program. Would also like to see the bioengineering electives all through until the point of Redbook entry: submit paperwork to curriculum for permanent addition to Redbook; the gain the 3.0 engineering topic validation from independent review outside the program. Push this effort into an bioengineering minor with in 2-3 vear

Name: Andrew Biaglow Date: 25 Aug 21

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- Add your digital signature in the space below:

BIAGLOW.ANDREW.I.1230117248

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Date: 2021.08.25 07:34:25 -04'00'

Name: Andrew Biaglow Date: 25 Aug 21

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Name: Andrew Biaglow Date: 25 Aug 21

Part I. Student Outcomes. Review the data and then check the box in the column that most closely represents your opinion.

The cadets in the program are able to:	Strongly Disagree		Neutral		Strongly Agree
• Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	☐	☐	☐	☐	☒
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• Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.	☐	☐	☐	☐	☒
• Acquire and apply new knowledge as needed, using appropriate learning strategies.	☐	☐	☐	☐	☒
• Have attained a thorough grounding in and working knowledge of the chemical engineering curriculum.	☐	☐	☐	☐	☒

Name: Andrew Biaglow Date: 25 Aug 21

Part II. Program Objectives. Check the box that most closely represents your opinion.

	Strongly Disagree		Neutral		Strongly Agree
The program objectives are consistent with the USMA mission.	☐	☐	☐	☐	☒
The program objectives are consistent with the needs of the Army.	☐	☐	☐	☐	☒
The program curriculum supports the program objectives.	☐	☐	☐	☐	☒
The student outcomes are consistent with the program mission and objectives.	☐	☐	☐	☐	☒
The program has a process for periodically assessing the achievement of its student outcomes.	☐	☐	☐	☐	☒
The survey methods used by the program are effective.	☐	☐	☐	☐	☒
The cadets in the program are aware of the program objectives.	☐	☐	☐	☐	☒
The cadets are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒
The cadets are satisfied with the courses in the program.	☐	☐	☐	☐	☒
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒

Name: Andrew Biaglow Date: 25 Aug 21

Part III. Open Questions.

Are we teaching the right classes? Based on the assessment data or on your personal opinion, is there a course or content area that the program should add to the curriculum?
Based on assessment, we need more solids handling.

Are we asking the right questions? Do you have any suggestions to improve the faculty survey for next year?
Probably OK but I wrote it.

Please add any additional comments that you would like to make below.
Keep working on bioengineering courses to solidify this thread.

Name: Bowers, Patrick D Date: 08/25/2021

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- Add your digital signature in the space below:

BOWERS.PATRICK.DEAN.1298949292
Digitally signed by BOWERS.PATRICK.DEAN.1298949292
Date: 2021.09.07 14:52:58 -04'00'

Name: Bowers, Patrick D Date: 08/25/2021

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- Process design

Name: Bowers, Patrick D Date: 08/25/2021

Part I. Student Outcomes. Review the data and then check the box in the column that most closely represents your opinion.

The cadets in the program are able to:	Strongly Disagree		Neutral		Strongly Agree
• Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	☐	☐	☐	☐	☒
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• Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.	☐	☐	☐	☒	☐
• Acquire and apply new knowledge as needed, using appropriate learning strategies.	☐	☐	☐	☒	☐
• Have attained a thorough grounding in and working knowledge of the chemical engineering curriculum.	☐	☐	☐	☐	☒

Name: Bowers, Patrick D Date: 08/25/2021

Part II. Program Objectives. Check the box that most closely represents your opinion.

	Strongly Disagree		Neutral		Strongly Agree
The program objectives are consistent with the USMA mission.	☐	☐	☐	☐	☒
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The student outcomes are consistent with the program mission and objectives.	☐	☐	☐	☐	☒
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The survey methods used by the program are effective.	☐	☐	☐	☐	☒
The cadets in the program are aware of the program objectives.	☐	☐	☐	☐	☒
The cadets are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒
The cadets are satisfied with the courses in the program.	☐	☐	☐	☐	☒
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒

Name: Bowers, Patrick D Date: 08/25/2021

Part III. Open Questions.

Are we teaching the right classes? Based on the assessment data or on your personal opinion, is there a course or content area that the program should add to the curriculum?
I believe we are teaching the right classes. I feel the program as a whole teaches the required material (and beyond) required for chemical engineering. The program is in keeping with other top-rated programs across the country.

Are we asking the right questions? Do you have any suggestions to improve the faculty survey for next year?
I believe the survey asks the correct questions. No recommendations for future surveys at this time.

Please add any additional comments that you would like to make below.

Name: MAJ Jeffrey Chin Date: 3SEP21

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- Add your digital signature in the space below:

CHIN.JEFFREY.ANDREW FONG.1290936485 Digitally signed by CHIN.JEFFREY.ANDREW FONG.1290936485 Date: 2021.09.07 11:33:00 -04'00'

Name: MAJ Jeffrey Chin Date: 3SEP21

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Name: MAJ Jeffrey Chin Date: 3SEP21

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The faculty are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒

Name: MAJ Jeffrey Chin Date: 3SEP21

Part III. Open Questions.

Are we teaching the right classes? Based on the assessment data or on your personal opinion, is there a course or content area that the program should add to the curriculum?
IAW Cadet feedback from the FEE, it may be beneficial to add a block of content focusing on biology concepts into CH400 with enough material that they would be capable of problem solving through biology related questions but not so much material that it would be all of CH275 (biology) in a few condensed lessons.

Are we asking the right questions? Do you have any suggestions to improve the faculty survey for next year?
Questions seem adequate at this time.

Please add any additional comments that you would like to make below.

Name: LTC Cowart, Sam Date: 8/27/2021

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COWART.SAMUEL.VERLON.1113821287

Digitally signed by COWART.SAMUEL.VERLON.1113821287
Date: 2021.08.27 08:57:15 -04'00'

Name: LTC Cowart, Sam Date: 8/27/2021

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- Demonstrate effective leadership and chemical engineering expertise.
- Contribute to the solution of infrastructure or operational problems in a complex operational environment.
- Succeed in graduate school or other advanced study programs.
- Advance their careers through clear and precise technical communication.

Chemical Engineering General Program Outcomes (Outcomes 1-7): On completion of the chemical engineering program, our graduates demonstrate an ability to:

- [Student Outcome 1] Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- Communicate effectively with a range of audiences.
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

Chemical Engineering Curriculum Outcomes (Outcome 8): The program provides the graduate with a thorough grounding and working knowledge of the chemical sciences, including:

- Chemistry
- Material and energy balances
- Safety and environmental factors
- Thermodynamics of physical and chemical equilibria
- Heat, mass, and momentum transfer
- Chemical reaction engineering
- Continuous and staged separation operations
- Process dynamics and control
- Modern experimental and computing techniques
- Process design

Name: LTC Cowart, Sam Date: 8/27/2021

Part I. Student Outcomes. Review the data and then check the box in the column that most closely represents your opinion.

The cadets in the program are able to:	Strongly Disagree		Neutral		Strongly Agree
• Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	☐	☐	☐	☐	☒
• Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	☐	☐	☐	☒	☐
• Communicate effectively with a range of audiences.	☐	☐	☐	☐	☒
• Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	☐	☐	☐	☒	☐
• Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	☐	☐	☐	☐	☒
• Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.	☐	☐	☐	☐	☒
• Acquire and apply new knowledge as needed, using appropriate learning strategies.	☐	☐	☐	☐	☒
• Have attained a thorough grounding in and working knowledge of the chemical engineering curriculum.	☐	☐	☐	☐	☒

Name: LTC Cowart, Sam Date: 8/27/2021

Part II. Program Objectives. Check the box that most closely represents your opinion.

	Strongly Disagree		Neutral		Strongly Agree
The program objectives are consistent with the USMA mission.	☐	☐	☐	☐	☒
The program objectives are consistent with the needs of the Army.	☐	☐	☐	☐	☒
The program curriculum supports the program objectives.	☐	☐	☐	☐	☒
The student outcomes are consistent with the program mission and objectives.	☐	☐	☐	☐	☒
The program has a process for periodically assessing the achievement of its student outcomes.	☐	☐	☐	☐	☒
The survey methods used by the program are effective.	☐	☐	☐	☐	☒
The cadets in the program are aware of the program objectives.	☐	☐	☐	☐	☒
The cadets are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☒	☐
The cadets are satisfied with the courses in the program.	☐	☐	☐	☒	☐
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒

Name: LTC Cowart, Sam Date: 8/27/2021

Part III. Open Questions.

Are we teaching the right classes? Based on the assessment data or on your personal opinion, is there a course or content area that the program should add to the curriculum?
I think that we cover all important aspects of a comprehensive chemical engineering curriculum at the undergraduate level. Performance on the FEE has been above the national average for the past 10 years.

Are we asking the right questions? Do you have any suggestions to improve the faculty survey for next year?
Add a question about faculty opinions of the cadets survey results for each student outcome. This question would be aimed at the faculty who teach the program's courses; their opinion of how students can perform with respect to a student outcome may be different than the students opinions of their competence on that outcome. As an example, I strongly agree that the cadets can communicate effectively with a range of audiences (SO 3). The end-of-semester and exit surveys from cadets indicate that they are less convinced that they meet that outcome.

Please add any additional comments that you would like to make below.
(continued from previous section) The additional question could be worded, "The cadets' surveys regarding this outcome are representative of their true abilities," with (SD/D/N/S/SA) choices.

Name: LTC Corey James Date: 10 SEP 21

2021 Faculty Surveys

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Instructions

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- Finally, there are some open questions in Part III where you can comment on the quality of the curriculum, the process itself or any other items you would like us to address.
- Submit the completed document to Dr. Biaglow by COB **Friday 10 September 2021**. Please be prompt.
- Direct any questions about the data or survey to Dr. Biaglow.
- Your responses will be consolidated, discussed at our program assessment meeting, and archived in our annual report.
- Add your digital signature in the space below:

JAMES.COREY.MATTHEW.1127038666 Digitally signed by JAMES.COREY.MATTHEW.1127038666 Date: 2021.09.13 12:15:27 -04'00'

Name: LTC Corey James Date: 10 SEP 21

The mission of the chemical engineering program is to prepare commissioned leaders of character who are proficient in applying chemical and engineering principles to solve problems in a complex operational environment.

Chemical Engineering Program Objectives: During a career as commissioned officers in the United States Army and beyond, program graduates:

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- Process dynamics and control
- Modern experimental and computing techniques
- Process design

Name: LTC Corey James Date: 10 SEP 21

Part I. Student Outcomes. Review the data and then check the box in the column that most closely represents your opinion.

The cadets in the program are able to:	Strongly Disagree		Neutral		Strongly Agree
• Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	☐	☐	☐	☐	☒
• Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	☐	☐	☐	☒	☐
• Communicate effectively with a range of audiences.	☐	☐	☐	☐	☒
• Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	☐	☐	☐	☐	☒
• Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	☐	☐	☐	☐	☒
• Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.	☐	☐	☐	☐	☒
• Acquire and apply new knowledge as needed, using appropriate learning strategies.	☐	☐	☐	☐	☒
• Have attained a thorough grounding in and working knowledge of the chemical engineering curriculum.	☐	☐	☐	☐	☒

Name: LTC Corey James Date: 10 SEP 21

Part II. Program Objectives. Check the box that most closely represents your opinion.

	Strongly Disagree		Neutral		Strongly Agree
The program objectives are consistent with the USMA mission.	☐	☐	☐	☐	☒
The program objectives are consistent with the needs of the Army.	☐	☐	☐	☐	☒
The program curriculum supports the program objectives.	☐	☐	☐	☐	☒
The student outcomes are consistent with the program mission and objectives.	☐	☐	☐	☐	☒
The program has a process for periodically assessing the achievement of its student outcomes.	☐	☐	☐	☐	☒
The survey methods used by the program are effective.	☐	☐	☐	☐	☒
The cadets in the program are aware of the program objectives.	☐	☐	☐	☐	☒
The cadets are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒
The cadets are satisfied with the courses in the program.	☐	☐	☐	☒	☐
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒

Name: LTC Corey James Date: 10 SEP 21

Part III. Open Questions.

Are we teaching the right classes? Based on the assessment data or on your personal opinion, is there a course or content area that the program should add to the curriculum?
Yes. A second semester of design would align us better with the curriculum at peer institutions.

Are we asking the right questions? Do you have any suggestions to improve the faculty survey for next year?
Yes

Please add any additional comments that you would like to make below.

Name: Galen Mandes Date: 08/25/2021

2021 Faculty Surveys

This is our annual faculty program assessment survey for academic year 2021 (2020-2021). The survey is required for all chemical engineering faculty members and is **very important** for our program assessment and future re-accreditation effort in 2026. The survey does three things. First, it documents that you have been made aware of the performance of our cadets on our program's student outcomes. Second, it serves to document your opinions of that performance. Third, it allows us to use your collective knowledge and experience to identify areas where we might need improvement. Thus, the completed surveys are your collective "thumbs up or down" to the various performance indicators we are tracking.

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- The survey also asks additional questions pertaining to the program objectives. These questions are found in "Part II." For this part of the survey, we are interested in your opinion of the relevance of the objectives and their consistency with the Academy mission and needs of the Army.
- Finally, there are some open questions in Part III where you can comment on the quality of the curriculum, the process itself or any other items you would like us to address.
- Submit the completed document to Dr. Biaglow by COB **Friday 10 September 2021**. Please be prompt.
- Direct any questions about the data or survey to Dr. Biaglow.
- Your responses will be consolidated, discussed at our program assessment meeting, and archived in our annual report.
- Add your digital signature in the space below:

MANDES.GALEN.THOMAS.1298945980 Digitally signed by MANDES.GALEN.THOMAS.1298945980 Date: 2021.08.25 11:02:45 -04'00'

Name: Galen Mandes Date: 08/25/2021

The mission of the chemical engineering program is to prepare commissioned leaders of character who are proficient in applying chemical and engineering principles to solve problems in a complex operational environment.

Chemical Engineering Program Objectives: During a career as commissioned officers in the United States Army and beyond, program graduates:

- Demonstrate effective leadership and chemical engineering expertise.
- Contribute to the solution of infrastructure or operational problems in a complex operational environment.
- Succeed in graduate school or other advanced study programs.
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Chemical Engineering General Program Outcomes (Outcomes 1-7): On completion of the chemical engineering program, our graduates demonstrate an ability to:

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- Communicate effectively with a range of audiences.
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- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

Chemical Engineering Curriculum Outcomes (Outcome 8): The program provides the graduate with a thorough grounding and working knowledge of the chemical sciences, including:

- Chemistry
- Material and energy balances
- Safety and environmental factors
- Thermodynamics of physical and chemical equilibria
- Heat, mass, and momentum transfer
- Chemical reaction engineering
- Continuous and staged separation operations
- Process dynamics and control
- Modern experimental and computing techniques
- Process design

Name: Galen Mandes Date: 08/25/2021

Part I. Student Outcomes. Review the data and then check the box in the column that most closely represents your opinion.

The cadets in the program are able to:	Strongly Disagree		Neutral		Strongly Agree
• Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	☐	☐	☐	☐	☒
• Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	☐	☐	☐	☐	☒
• Communicate effectively with a range of audiences.	☐	☐	☒	☐	☐
• Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	☐	☐	☐	☐	☒
• Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	☐	☐	☐	☐	☒
• Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.	☐	☐	☐	☐	☒
• Acquire and apply new knowledge as needed, using appropriate learning strategies.	☐	☐	☐	☐	☒
• Have attained a thorough grounding in and working knowledge of the chemical engineering curriculum.	☐	☐	☐	☐	☒

Name: Galen Mandes Date: 08/25/2021

Part II. Program Objectives. Check the box that most closely represents your opinion.

	Strongly Disagree		Neutral		Strongly Agree
The program objectives are consistent with the USMA mission.	☐	☐	☐	☐	☒
The program objectives are consistent with the needs of the Army.	☐	☐	☐	☐	☒
The program curriculum supports the program objectives.	☐	☐	☐	☐	☒
The student outcomes are consistent with the program mission and objectives.	☐	☐	☐	☐	☒
The program has a process for periodically assessing the achievement of its student outcomes.	☐	☐	☐	☐	☒
The survey methods used by the program are effective.	☐	☐	☐	☐	☒
The cadets in the program are aware of the program objectives.	☐	☐	☐	☐	☒
The cadets are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒
The cadets are satisfied with the courses in the program.	☐	☐	☐	☐	☒
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒

Name: Galen Mandes Date: 08/25/2021

Part III. Open Questions.

Are we teaching the right classes? Based on the assessment data or on your personal opinion, is there a course or content area that the program should add to the curriculum?
We are teaching the right classes.

Are we asking the right questions? Do you have any suggestions to improve the faculty survey for next year?
We are asking the right questions. It may be helpful to have a "not observed" category on the survey as the junior rotators will only have a limited window into the more advanced ChE cirricula

Please add any additional comments that you would like to make below.

Name: Dr. Enoch Nagelli Date: 01SEP21

2021 Faculty Surveys

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- Finally, there are some open questions in Part III where you can comment on the quality of the curriculum, the process itself or any other items you would like us to address.
- Submit the completed document to Dr. Biaglow by COB **Friday 10 September 2021**. Please be prompt.
- Direct any questions about the data or survey to Dr. Biaglow.
- Your responses will be consolidated, discussed at our program assessment meeting, and archived in our annual report.
- Add your digital signature in the space below:

NAGELLI.ENOCH.A.1523357600
Digitally signed by NAGELLI.ENOCH.A.1523357600
Date: 2021.09.07 10:13:26 -04'00'

Name: Dr. Enoch Nagelli Date: 01SEP21

The mission of the chemical engineering program is to prepare commissioned leaders of character who are proficient in applying chemical and engineering principles to solve problems in a complex operational environment.

Chemical Engineering Program Objectives: During a career as commissioned officers in the United States Army and beyond, program graduates:

- Demonstrate effective leadership and chemical engineering expertise.
- Contribute to the solution of infrastructure or operational problems in a complex operational environment.
- Succeed in graduate school or other advanced study programs.
- Advance their careers through clear and precise technical communication.

Chemical Engineering General Program Outcomes (Outcomes 1-7): On completion of the chemical engineering program, our graduates demonstrate an ability to:

- [Student Outcome 1] Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
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- Heat, mass, and momentum transfer
- Chemical reaction engineering
- Continuous and staged separation operations
- Process dynamics and control
- Modern experimental and computing techniques
- Process design

Name: Dr. Enoch Nagelli Date: 01SEP21

Part I. Student Outcomes. Review the data and then check the box in the column that most closely represents your opinion.

The cadets in the program are able to:	Strongly Disagree		Neutral		Strongly Agree
• Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	☐	☐	☐	☐	☒
• Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	☐	☐	☐	☐	☒
• Communicate effectively with a range of audiences.	☐	☐	☐	☒	☐
• Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	☐	☐	☐	☐	☒
• Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	☐	☐	☐	☐	☒
• Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.	☐	☐	☐	☐	☒
• Acquire and apply new knowledge as needed, using appropriate learning strategies.	☐	☐	☐	☒	☐
• Have attained a thorough grounding in and working knowledge of the chemical engineering curriculum.	☐	☐	☐	☐	☒

Name: Dr. Enoch Nagelli Date: 01SEP21

Part II. Program Objectives. Check the box that most closely represents your opinion.

	Strongly Disagree		Neutral		Strongly Agree
The program objectives are consistent with the USMA mission.	☐	☐	☐	☐	☒
The program objectives are consistent with the needs of the Army.	☐	☐	☐	☐	☒
The program curriculum supports the program objectives.	☐	☐	☐	☐	☒
The student outcomes are consistent with the program mission and objectives.	☐	☐	☐	☐	☒
The program has a process for periodically assessing the achievement of its student outcomes.	☐	☐	☐	☐	☒
The survey methods used by the program are effective.	☐	☐	☐	☐	☒
The cadets in the program are aware of the program objectives.	☐	☐	☐	☐	☒
The cadets are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒
The cadets are satisfied with the courses in the program.	☐	☐	☐	☒	☐
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒

Name: Dr. Enoch Nagelli Date: 01SEP21

Part III. Open Questions.

Are we teaching the right classes? Based on the assessment data or on your personal opinion, is there a course or content area that the program should add to the curriculum?
As a consideration, prefer we teach chemical engineering transport phenomena as one of the core courses and use the Bird Stewart Lightfoot textbook.This course can replace MC312 in our cirruculum as it covers the fundamentals of heat, mass and momentum transport in one course. I would re-name CH485 as"Heat Exchangers" to be focused on application. Recommend push CH363 back to firstie year first semester to swap with CH365. This movement of courses is to introduce/teach the fundamentals of chemE first in the cirriculum and the courses with application focus be later to apply the fudamentals learned as firstie.

Are we asking the right questions? Do you have any suggestions to improve the faculty survey for next year?

Please add any additional comments that you would like to make below.
I highly encourage if the cadets 8TAP and pre-requisites are met to take CH383 yearling year first semester. this provides flexibility for majors to focus in ChemE/engr electives cow year and beyond.The following is a proposed cow and first year core/amjor course 8TAP: Fall cow semester: CH365, MC311, EE301, MC300 Spring cow semester: CH364, CH367, CH3XX (new transport course) Fall Firstie semester: CH363, CH459, CH485 (Heat Exchangers), Engr elective 1 Spring Firstie semester: CH400, CH402, Engr elective 2, Engr Elective 3

Name: CPT Caspar Yi Date: 08/30/2021

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- Add your digital signature in the space below:

YI.CASPAR.CHAMIL.1298943740

Digitally signed by YI.CASPAR.CHAMIL.1298943740
Date: 2021.09.07 14:14:11 -04'00'

Name: CPT Caspar Yi Date: 08/30/2021

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Chemical Engineering Program Objectives: During a career as commissioned officers in the United States Army and beyond, program graduates:

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- Heat, mass, and momentum transfer
- Chemical reaction engineering
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- Process dynamics and control
- Modern experimental and computing techniques
- Process design

Name: CPT Caspar Yi Date: 08/30/2021

Part I. Student Outcomes. Review the data and then check the box in the column that most closely represents your opinion.

The cadets in the program are able to:	Strongly Disagree		Neutral		Strongly Agree
• Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	☐	☐	☐	☐	☒
• Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	☐	☐	☐	☒	☐
• Communicate effectively with a range of audiences.	☐	☐	☐	☒	☐
• Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	☐	☐	☐	☐	☒
• Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	☐	☐	☐	☐	☒
• Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.	☐	☐	☐	☒	☐
• Acquire and apply new knowledge as needed, using appropriate learning strategies.	☐	☐	☐	☒	☐
• Have attained a thorough grounding in and working knowledge of the chemical engineering curriculum.	☐	☐	☐	☒	☐

Name: CPT Caspar Yi Date: 08/30/2021

Part II. Program Objectives. Check the box that most closely represents your opinion.

	Strongly Disagree		Neutral		Strongly Agree
The program objectives are consistent with the USMA mission.	☐	☐	☐	☒	☐
The program objectives are consistent with the needs of the Army.	☐	☐	☐	☐	☒
The program curriculum supports the program objectives.	☐	☐	☐	☒	☐
The student outcomes are consistent with the program mission and objectives.	☐	☐	☐	☒	☐
The program has a process for periodically assessing the achievement of its student outcomes.	☐	☐	☐	☒	☐
The survey methods used by the program are effective.	☐	☐	☐	☐	☒
The cadets in the program are aware of the program objectives.	☐	☐	☐	☒	☐
The cadets are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒
The cadets are satisfied with the courses in the program.	☐	☐	☐	☒	☐
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒

Name: CPT Caspar Yi Date: 08/30/2021

Part III. Open Questions.

Are we teaching the right classes? Based on the assessment data or on your personal opinion, is there a course or content area that the program should add to the curriculum?
The department is heading in the right direction in teaching the right courses such as standing up the new Introduction to Bioengineering elective. More importantly, the content in the course should balance biological systems in additional to renewable energy and traditional chemical engineering processes.

Are we asking the right questions? Do you have any suggestions to improve the faculty survey for next year?
The program is asking the right questions and should emphasize the communication aspect and the ability to interpret, analyze, and articulate results in a concise, succinct manner. Cadets need work on working on their verbal and written skills.

Please add any additional comments that you would like to make below.

Name: Simuck F. Yuk Date: 08/29/21

2021 Faculty Surveys

This is our annual faculty program assessment survey for academic year 2021 (2020-2021). The survey is required for all chemical engineering faculty members and is **very important** for our program assessment and future re-accreditation effort in 2026. The survey does three things. First, it documents that you have been made aware of the performance of our cadets on our program's student outcomes. Second, it serves to document your opinions of that performance. Third, it allows us to use your collective knowledge and experience to identify areas where we might need improvement. Thus, the completed surveys are your collective "thumbs up or down" to the various performance indicators we are tracking.

Instructions

- Put your name and date on the top of each page.
- Please review the data in the document "Program Assessment Data - 11 August 2021." The data pertain to the level of achievement of our cadets for AY2021. Answer the survey questions in "Part I" of this document based on your opinions of that data.
- The survey also asks additional questions pertaining to the program objectives. These questions are found in "Part II." For this part of the survey, we are interested in your opinion of the relevance of the objectives and their consistency with the Academy mission and needs of the Army.
- Finally, there are some open questions in Part III where you can comment on the quality of the curriculum, the process itself or any other items you would like us to address.
- Submit the completed document to Dr. Biaglow by COB **Friday 10 September 2021**. Please be prompt.
- Direct any questions about the data or survey to Dr. Biaglow.
- Your responses will be consolidated, discussed at our program assessment meeting, and archived in our annual report.
- Add your digital signature in the space below:

YUK.SIMUCK.1591450413 Digitally signed by YUK.SIMUCK.1591450413 Date: 2021.08.29 13:37:03 -04'00'

Name: Simuck F. Yuk Date: 08/29/21

The mission of the chemical engineering program is to prepare commissioned leaders of character who are proficient in applying chemical and engineering principles to solve problems in a complex operational environment.

Chemical Engineering Program Objectives: During a career as commissioned officers in the United States Army and beyond, program graduates:

- Demonstrate effective leadership and chemical engineering expertise.
- Contribute to the solution of infrastructure or operational problems in a complex operational environment.
- Succeed in graduate school or other advanced study programs.
- Advance their careers through clear and precise technical communication.

Chemical Engineering General Program Outcomes (Outcomes 1-7): On completion of the chemical engineering program, our graduates demonstrate an ability to:

- [Student Outcome 1] Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- Communicate effectively with a range of audiences.
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

Chemical Engineering Curriculum Outcomes (Outcome 8): The program provides the graduate with a thorough grounding and working knowledge of the chemical sciences, including:

- Chemistry
- Material and energy balances
- Safety and environmental factors
- Thermodynamics of physical and chemical equilibria
- Heat, mass, and momentum transfer
- Chemical reaction engineering
- Continuous and staged separation operations
- Process dynamics and control
- Modern experimental and computing techniques
- Process design

Name: Simuck F. Yuk Date: 08/29/21

Part I. Student Outcomes. Review the data and then check the box in the column that most closely represents your opinion.

The cadets in the program are able to:	Strongly Disagree		Neutral		Strongly Agree
• Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	☐	☐	☐	☐	☐+
• Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	☐	☐	☐	☐	☐+
• Communicate effectively with a range of audiences.	☐	☐	☐	☐+	☐
• Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	☐	☐	☐	☐+	☐
• Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	☐	☐	☐	☐	☐+
• Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.	☐	☐	☐	☐	☐+
• Acquire and apply new knowledge as needed, using appropriate learning strategies.	☐	☐	☐	☐+	☐
• Have attained a thorough grounding in and working knowledge of the chemical engineering curriculum.	☐	☐	☐	☐+	☐

Name: Simuck F. Yuk Date: 08/29/21

Part II. Program Objectives. Check the box that most closely represents your opinion.

	Strongly Disagree		Neutral		Strongly Agree
The program objectives are consistent with the USMA mission.	☐	☐	☐	☐	☒
The program objectives are consistent with the needs of the Army.	☐	☐	☐	☐	☒
The program curriculum supports the program objectives.	☐	☐	☐	☐	☒
The student outcomes are consistent with the program mission and objectives.	☐	☐	☐	☐	☒
The program has a process for periodically assessing the achievement of its student outcomes.	☐	☐	☐	☐	☒
The survey methods used by the program are effective.	☐	☐	☐	☒	☐
The cadets in the program are aware of the program objectives.	☐	☐	☐	☒	☐
The cadets are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒
The cadets are satisfied with the courses in the program.	☐	☐	☐	☒	☐
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty are given an opportunity to provide their opinion about the program objectives.	☐	☐	☐	☐	☒

Name: Simuck F. Yuk Date: 08/29/21

Part III. Open Questions.

Are we teaching the right classes? Based on the assessment data or on your personal opinion, is there a course or content area that the program should add to the curriculum?
In the future, it would be nice if we can add the course which prepares cadets for engineering graduate school since many of reseach cadets consider for attending graduate schools. Some of R1 level civilian universities have some sorts of advanced senior courses that help seniors for typical graduate school. A care must be taken for what kind of contents (i.e., programming or mathematical skills) we need to introduce to our cadets, though.

Are we asking the right questions? Do you have any suggestions to improve the faculty survey for next year?
For now, I don't think the questions being asked in the survey should be revised further.

Please add any additional comments that you would like to make below.