Name: LTC Matthew Armstrong Date: 22JUL20

2020 Faculty Surveys

This is our annual faculty program assessment survey for academic year 2020 (2019-2020). The survey is required for all chemical engineering faculty members and is **very important** for our program assessment and re-accreditation effort. 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: 2020.07.24 07:17:50 -04'00'

Name: LTC Matthew Armstrong Date: 22JUL20

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.

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- 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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- 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 Matthew Armstrong Date: 22JUL20

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: 22JUL20

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 have input into the development of the program objectives.	☐	☐	☐	☐	☒
The cadets are satisfied with the courses in the program.	☐	☐	☐	☒	☐
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty (past and present) have contributed to the development of the program objectives.	☐	☐	☐	☐	☒

Name: LTC Matthew Armstrong Date: 22JUL20

Part III. Open questions.

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

We are teaching the right classes on par with other contemporary chemical engineering programs. I would like to see a more robust set of chemical engineering focused electives for our cadets to choose from: numerical methods in chemical engineering; etc. Perhaps get the bioengineering three course sequence up and running. In addition I questions the efficacy of MC312, and would like to see the development of a introduction to chemical engineering transport class offered in the chemical engineering program. Perhaps maintain the MC311...but then transition to intro to chemical engineering transport taught in this program.

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

The questions are fine. However it is noted that the perception of cadet involvement to the cadets is often different than reality.

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

Add numerical methods...cover Mathematica, MATLAB, CHEMCAD and excel. As a program our cadets have always struggled with their technical writing. A 1 credit chemical engineering technical writing course would greatly benefit the cadets in our major.

ARMSTRONG.MATTHEW.JOHN.1027486980 Digitally signed by ARMSTRONG.MATTHEW.JOHN.1027486980 Date: 2020.07.22 09:10:27 -04'00'

Name: Andrew Biaglow Date: 23 July 20

2020 Faculty Surveys

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- Add your digital signature in the space below:

BIAGLOW.ANDREW.I.1230117248 Digitally signed by BIAGLOW.ANDREW.I.1230117248 Date: 2020.07.23 18:06:37 -04'00'

Name: Andrew Biaglow Date: 23 July 20

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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: Andrew Biaglow Date: 23 July 20

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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• 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: Andrew Biaglow Date: 23 July 20

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 have input into the development of the program objectives.	☐	☐	☐	☐	☒
The cadets are satisfied with the courses in the program.	☐	☐	☐	☐	☒
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty (past and present) have contributed to the development of the program objectives.	☐	☐	☐	☐	☒

Name: Andrew Biaglow Date: 23 July 20

Part III. Open questions.

Are we teaching the right classes? Based on the assessment data or on your personal opinion, is there a course that the program should add to the curriculum?
Yes. Should add CH401.

Are we asking the right questions? Do you have any suggestions to improve the faculty survey for next year?
Yes. No.

Please add any additional comments that you would like to make below.
None.

Name: Bull, Geoffrey Date: 8/10/2020

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- Add your digital signature in the space below:

BULL.GEOFFREY.ROBERT.1144437051

Digitally signed by BULL.GEOFFREY.ROBERT.1144437051
Date: 2020.08.10 14:12:56 -04'00'

Name:_Bull_____ Date:_____

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- Process design

Name: Bull Date:_____

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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• 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: Bull Date:_____

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 cadets in the program are aware of the program objectives.	☐	☐	☒	☐	☐
The cadets have input into the development of the program objectives.	☐	☐	☐	☒	☐
The cadets are satisfied with the courses in the program.	☐	☐	☐	☒	☐
The faculty are aware of the program objectives.	☐	☐	☐	☒	☐
The faculty (past and present) have contributed to the development of the program objectives.	☐	☐	☐	☐	☒

Name: Bull Date:_____

Part III. Open questions.

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

We need a better way of teaching technical communication. The experience with MC312 as the Signature Writing Event, where 9 chemical engineers were 'non-proficient' on the first attempt. This is unsatisfactory and I don't think the piecemeal way we are trying to integrate especially written communication through the entire curriculum is going to be successful. I think a dedicated 1.5 credit hour technical communication course would be very beneficial, especially if taught early in the program.

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

Not the survey, directly, but I might include the Signature Writing Event results from MC312 directly, as that is the Academy-level 'proficient/non-proficient' measure. I recognize these are Cows, not graduates, but I think it is an important individual result.

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

Name: CPT Jeffrey Chin Date: 31JUL20

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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: 2020.08.10 12:12:55 -04'00'

Name: CPT Jeffrey Chin Date: 31JUL20

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Name: CPT Jeffrey Chin Date: 31JUL20

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Name: CPT Jeffrey Chin Date: 31JUL20

Part III. Open questions.

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

I think that given the constraints of the core curriculum, including military and physical requirements not commonly found in undergraduate programs, and time available the right classes are being taught to cadets. The cross-over curriculum with the civil and mechanical engineering department is a huge positive factor because of the interdicisplinary gains and networking benefit of interacting with engineering major cadets outside of the smaller ChemE cohort. The flexability of the 3EA available elective courses is more than sufficient to stimulate individual specialty study aspirations.

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

In my opinion and experience having been a cadet that graduated through the program the questions are satisfactory for evaluating the ChemE program.

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

From my experience my opinion is that the program objectives are clearly aimed at producing well rounded chemical engineers capable of critical problem solving in a complex world.

Name: MAJ Trevor Corrigan Date: 22JUL20

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- Add your digital signature in the space below:

CORRIGAN.TREVOR.JOSH.1274821392

Digitally signed by CORRIGAN.TREVOR.JOSH.1274821392
Date: 2020.07.22 10:42:07 -04'00'

Name: MAJ Trevor Corrigan Date: 22JUL20

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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: MAJ Trevor Corrigan Date: 22JUL20

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: MAJ Trevor Corrigan Date: 22JUL20

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 have input into the development of the program objectives.	☐	☐	☐	☒	☐
The cadets are satisfied with the courses in the program.	☐	☐	☐	☒	☐
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty (past and present) have contributed to the development of the program objectives.	☐	☐	☐	☐	☒

Name: MAJ Trevor Corrigan Date: 22JUL20

Part III. Open questions.

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

I believe we are teaching the correct courses to achieve our stated objectives.

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

No.

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

I believe that when we think about faculty recruitment we should also consider impact to student recruitment.

Having junior rotators who are passionate Chem E's teaching CH101/151 will directly lead to a higher number of Chem Eng Majors. As witnessed this last year, on the contrary not having that Chem E presence in the CH101 classroom results in significantly lower enrollment in the major.

Name: LTC Sam Cowart Date: 22 July 20

2020 Faculty Surveys

This is our annual faculty program assessment survey for academic year 2020 (2019-2020). The survey is required for all chemical engineering faculty members and is **very important** for our program assessment and re-accreditation effort. 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

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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 31 July 2020**. 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:

COWART.SAMUEL.VERLON.1113821287

Digitally signed by COWART.SAMUEL.VERLON.1113821287
Date: 2020.07.22 16:16:26 -04'00'

Name: LTC Sam Cowart Date: 22 July 20

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.

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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 Sam Cowart Date: 22 July 20

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 Sam Cowart Date: 22 July 20

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 have input into the development of the program objectives.	☐	☐	☒	☐	☐
The cadets are satisfied with the courses in the program.	☐	☐	☒	☐	☐
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty (past and present) have contributed to the development of the program objectives.	☐	☐	☐	☐	☒

Name: LTC Sam Cowart Date: 22 July 20

Part III. Open questions.

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

It appears that we have addressed the gaps in historical FEE performance with the addition of CH365, CH367, and CH400. A course in unit operations may help to futher ensure program outcomes are being addressed while also reinforcing multiple topics found in the FEE.

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

Add questions to student surveys regarding their exposure to the program outcomes, their involvement in development of program outcomes, and their satisfaction with the program. Although we may discuss program outcomes with cadets, it is difficult to judge their satisfaction with respect to the program outcomes without specific input.

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

The chemical engineering program has grown in student, faculty, and course size since the initial ABET accreditation. It is encouraging to see continual development in the program to increase student efficacy in chemical engineering skills.

Name: LTC James Date: 10 AUG 20

2020 Faculty Surveys

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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 31 July 2020**. 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: 2020.08.10 13:13:24 -04'00'

Name: LTC James Date: 10 AUG 20

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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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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- 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 James Date: 10 AUG 20

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 James Date: 10 AUG 20

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 have input into the development of the program objectives.	☐	☐	☐	☐	☒
The cadets are satisfied with the courses in the program.	☐	☐	☐	☒	☐
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty (past and present) have contributed to the development of the program objectives.	☐	☐	☐	☐	☒

Name: LTC James Date: 10 AUG 20

Part III. Open questions.

Are we teaching the right classes? Based on the assessment data or on your personal opinion, is there a course that the program should add to the curriculum?
The sequence courses are fine but we need electives. Numerical methods, explosives design, catalysis, etc.

Are we asking the right questions? Do you have any suggestions to improve the faculty survey for next year?
Yes, no.

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

Name: Dr. Enoch Nagelli Date: 29JULY20

2020 Faculty Surveys

This is our annual faculty program assessment survey for academic year 2020 (2019-2020). The survey is required for all chemical engineering faculty members and is **very important** for our program assessment and re-accreditation effort. 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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- 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.
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- Direct any questions about the data or survey to Dr. Biaglow.
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- Add your digital signature in the space below:

Name:_____ Date:_____

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

Name: Dr. Enoch Nagelli Date: 29JULY20

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: 29JULY20

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.	☐	☐	☐	☐	☒
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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 have input into the development of the program objectives.	☐	☐	☐	☐	☒
The cadets are satisfied with the courses in the program.	☐	☐	☐	☒	☐
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty (past and present) have contributed to the development of the program objectives.	☐	☐	☐	☐	☒

Name: Dr. Enoch Nagelli Date: 29July20

Part III. Open questions.

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

In orde to help address the lower trending average on the FEE topic of Mass transfer and separation, I would prefer to swap/replace CH363 and CH485 where they are taught in the curriculum. It would be more meaningul for the cadets to concurrently take CH485 (fundamentals of heat and mass with momentum, see below) together with MC311 in their 8TAP to further align concepts of transport phenomena from a chemical engineering perspective with fluids. Offering CH363 firstie year first semster concurrently with CH365 will help apply thermodynamics of phase behavior in Separations and effectively teach mass transfer for FEE

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

N/A

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

Integrating momentum with heat and mass in CH485 to re-brand the class as a general "Chemical Engineering Transport Phenomena" course will help address the "student outcome 8 average academic transcript GPA" for the topic of transport phenomena since the avergage was overall the lowest amongst the 5 years. Having a standalone chemical engineering transport phenomena course (cover momentum, heat, and mass transfer topics in the context of chemical engineering processes) will be a benficial option for cadets without having to introduce a brand new course into the 8TAP. Offering CH485 during cow year first semester will help address this low 5 year average GPA

Name: CPT Caspar C. Yi Date: 07/31/2020

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- 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:

Name: CPT Caspar C. Yi Date: 07/31/2020

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- Demonstrate effective leadership and chemical engineering expertise.
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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 C. Yi Date: 07/31/2020

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 C. Yi Date: 07/31/2020

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 have input into the development of the program objectives.	☐	☐	☐	☐	☒
The cadets are satisfied with the courses in the program.	☐	☐	☐	☒	☐
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty (past and present) have contributed to the development of the program objectives.	☐	☐	☐	☐	☒

Name: CPT Caspar C. Yi Date: 07/31/2020

Part III. Open questions.

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

Although the electrical engineering course is important, reinforcing EE301 concepts in an Electrochemistry elective course for the department would be worthwhile. I believe this will gravitate students toward real world applications for alternative energy sources. An applications in Electrochemistry course would nest thermodynamics, fluid dynamics, and electrical engineering concepts.

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.

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

As a returning graduate of the Chemical Engineering Program, I believe the program is on a positive and upwards trajectory. I believe exposing cadets to all disciplines within chemical engineering is important for their further educational experiences.

Name: Simuck F. Yuk Date: 07/31/20

2020 Faculty Surveys

This is our annual faculty program assessment survey for academic year 2020 (2019-2020). The survey is required for all chemical engineering faculty members and is **very important** for our program assessment and re-accreditation effort. 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 - 20 July 2020." The data pertain to the level of achievement of our cadets for AY2020. 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 31 July 2020**. 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: 2020.07.31 16:27:29 -04'00'

Name: Simuck F. Yuk Date: 07/31/20

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: 07/31/20

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: 07/31/20

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 have input into the development of the program objectives.	☐	☐	☐	☒	☐
The cadets are satisfied with the courses in the program.	☐	☐	☐	☐	☒
The faculty are aware of the program objectives.	☐	☐	☐	☐	☒
The faculty (past and present) have contributed to the development of the program objectives.	☐	☐	☐	☒	☐

Name: Simuck F. Yuk Date: 07/31/20

Part III. Open questions.

Are we teaching the right classes? Based on the assessment data or on your personal opinion, is there a course that the program should add to the curriculum?
I don't believe there should be additional courses which needed to be added into the curriculum since the existing courses cover the necessary core concepts in chemical engineering.

Are we asking the right questions? Do you have any suggestions to improve the faculty survey for next year?
It is possible that we do need to add the questions related to virtual teaching environment since all the courses will be affected by the presence of COVID-19 this and next coming years.

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