DEPARTMENT OF THE ARMY
UNITED STATES MILITARY ACADEMY
West Point, New York 10996

MADN-CBE 17 December 2025

MEMORANDUM FOR RECORD

SUBJECT: Chemical Engineering Program Assessment and AAR (AY26-1)

1. The junior and senior faculty of the chemical engineering program at the United States Military Academy met on 17 December 2025 to conduct a post-semester review of courses taught during Fall of 2025 and a program assessment. The faculty members in attendance were Prof. Andrew Biaglow, COL Corey James, LTC Sam Cowart, Dr. Enoch Nagelli, Dr. Simuck Yuk, MAJ Samuel Lowell, MAJ Louis Tobergte, MAJ Josh Frey, CPT(P) Liz Golonski, and CPT(P) Chris Stewart, and CPT Denis Gilinski. Chemical engineering faculty member not in attendance was MAJ Nijel Rogers.

2. Each course director presented topics and relevant assessments to their specific courses. These topics are outlined in more detail in the individual course assessments. These end of semester discussions serve as a tool to gauge effectiveness of course content and administration in meeting the ABET student outcomes specific to each course. Comments and questions from these discussions support the more formal content of the written course assessment packages that are completed at the end of each academic term. Ideas for course improvement and potential future changes are the focus of the discussions.

3. The following courses were discussed: CH350 Bioprocess Engineering, CH363 Separations Processes, CH365 Chemical Engineering Thermodynamics, CH459 Chemical Engineering Laboratory, and CH485 Heat and Mass Transfer were reviewed and thoroughly discussed by all attendees. Some of the topics led to broader discussions relevant to the entire program. These included: 1) Use of the Fundamentals of Engineering Reference Manual as an authorized reference for upper level major courses, 2) The level of group work and assessing individual contributions in CH459 Chemical Engineering Laboratory, 3) The re-structuring of a Term End Exam for CH459 Chemical Engineering Laboratory, 4) The need for additional Arnold Cell to continued the sustained effort and development of the labs for the CH485 course, and 4) Curriculum update to move CH363 Separations Processed to Firstie year in exchange with CH365 Chemical Engineering Thermodynamics to Cow year.

4. The point of contact for this document is the undersigned at enoch.nagelli@westpoint.edu or 845-938-3904.

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UNITED STATES MILITARY ACADEMY
WEST POINT

Chemical Engineering

Course and Program AAR, AY26-1

Dr. Enoch Nagelli & LTC Sam Cowart

Agenda

- CH350
- CH363
- CH365
- CH459
- CH485
- Chemical Engineering Program AAR Comments

CH350 AAR

- Course average: 86.9%; TEE average: 81%

Sustain:

- ✓ Providing various scenarios that merge multiple concepts for in-class activities / problem sets helped cadets understand the relationship between mass balance and cell growth and effects of modifying the system
- ✓ Focusing on kinetics and energy from a biological perspective helped cadets understand the key differences between chemical engineering and biological approaches.

Improve:

- ✓ Incorporate more outside texts (pdf) to cover Block I: Biomolecular Considerations
- ✓ Consider merging lessons to be able to incorporate more material from Shuler *et al*
- ✓ Continuous improvement of problems in the Problem Set, WPRs, and TEE is necessary to better align with the learning objectives.

CH363 AAR

- **Sustain:**

  Capstone – this exercise, although it has been in existence for many years, is sufficiently rigorous and helps with the transition from graphical column characterization to digital characterization (ChemCAD)

  General Course Sequence – the course is organized well and flows in a logical manner

- **Improve:**

  NTUs - Continue to insert the idea of NTUs anywhere that we can. This has improved and should prepare Cadets for CH459, but it can always be better.

  Thermo and Mass Transport – In order to teach this course in line with peer institutions, we should find a way to teach separations after thermodynamics and mass transport. Separations would be better understood if we changed the sequence.

- **Do we want to re-energize the Bayway trip (or similar)? Do we have the connections still?**

CH365 AAR

- Response to AY25 course assessment:
  - Efficiencies found – Added videos to help with absentees.
  - Excess Gibbs energy calculations added and expanded.
  - Rubric for CDP not developed.
- AY26 course assessment:
  - Project - needs additional data sets and expand gE calcs.
  - Exams: performance was strong.
    - WPRs 89.0% ± 8% compared to 89.2% ± 10% in AY24.
    - TEE: xx.x ± xx% versus 82.2 ± 15% in AY24.
  - Course assessment incomplete as of 12-15-25.
  - Watermark surveys 23/25.
  - Writing assignment (embedded indicator) – resumes, iterative.
  - Tracking performance in FEE for thermo topic
- Sustain: rubric grading with resubmission for homework. Cadets to find mistakes, make corrections and describe what they did wrong.
- Sustain – videos of lessons for government shutdown ops.

CH459 AAR

- **AY26-1 CH459 Course Structure:**
  - Teams of 3-4 Cadets remained paired throughout both Round Robin cycles.
  - Course structure remained consistent with the previous AY to ensure stability for the ABET record year.

- **WPR1 tests round robin 1 material & WPR2 tests round robin 2 material.**
  - **WPR1 Average = 79.6%**
  - **WPR2 Average = 87.2%**

- **Emphasis in the Labs:**
  - Improve: Focus on conducting sample calculations to derive key parameters for experimental validation.
  - Sustain: Prioritize developing and labeling flow charts with correct process variables and units.
  - **Note: Comprehensive lab solutions were generated for every experiment..**

- **Overall, similar performance between C1D1 and E1F1 section.**
  - **To prevent Cadets from "boxing" themselves into fixed roles, participation in data collection was mandated for at least the first day.**
  - **Lower performing cadets were relying on teammates for calculations and ChemCad.**

CH485 AAR

Previous changes maintained
Changes made 26-1
Recommended changes 27-1

- Course average: 88.71% (before TEE), AY25-1: 87.96%
- Maintained high number of example problems for each lesson
  - FEE practice problems
  - Problems from other transport texts useful as new PS problems
- Maintained problem solving days before WPRs/ICPS
- Maintained formal discussion of radiation heat transfer
  - Included new ICPS, PS, and Lab problems that involved radiation
- Maintained number of problem sets to 10 (50 points each)
  - PS1 new (25-1); focused on fundamental transport relationships and solving basic differential equations; set the stage for the course
  - Shortened middle-of-semester PS; due more often and relevant to in-class material
- Changed Lab 7 to Convective & Radiative Heat Transfer
  - Cadets collected their own data (1 lab period) and conducted analysis (~1 week)
- Conduct thorough maintenance on lab apparatus
  - Develop / re-start backup labs (membrane air separator, LL Extractor, WW column)
- Develop new PS, ICPS, WPR problems for 27-1.

Chem E Prog AAR

End of Semester Close Out for CDs: End of Semester Archive/Course Assessments

- **End of Semester Archive DUE within 1 Week after posting final grades (IAW CD Handbook) for Course/Graded Events Folder content.**
  - **Department Sharepoint: All course materials in Course Folder; Graded events into GE folder**
- **Course Assessment DUE within 30 days of final grades posting! (IAW CD Hbook)**
- **Assistance on outcomes assessment worksheets (1/0)**
- **Submit to Dr. Biaglow for review.**

- **Please include only 6 years of data in your assessment packets.**

Example:

5. Course QPA (previous 6 years)

AY20-1	AY21-1	AY22-1	AY23-1	AY24-1	AY25-1
3.52	3.62	3.72	3.54	3.73	3.62

6. TEE History (previous 6 years)

AY20-1	AY21-1	AY22-1	AY23-1	AY24-1	AY25-1
86.1%	N/A	86.1%	75.0%	83.9%	82.8%

Chem E Prog AAR

Classroom Observations continue in AY26-2!

ABET Accreditation

- Record year AY26
- Self-Study submitted 01 July 2026
- Program evaluator visit: Fall 2026 (AY27-1)
- eCoursebooks for 26-2. CH300 and CH450 (full); core courses complete
- Full assessment rubrics for all graded events (1/0)
- Document waivers (irregularities for graduation) for Firsties

Advisory Board on 10APR26

- Dinner with Board members on 09 April 2026
- Meeting is on 10 April (1-Day); (Coordinate for support from ChemEs in CH101)
- Dr. Nagelli coordinating with board members & IPR with COL James/LTC Jaffett
- MAJ Rogers (Primary) & MAJ Frey & CPT Stewart (Assistants)

DAC updates

- Everyone will be a DAC in 27-1.
- Cadets managed by LTC Cowart, MAJ Lowell, MAJ Tobergte will be re-distributed ~ 1 Mar. (35 majors, 6 minors)

AIChE Club (OIC: MAJ Lowell and CIC: CDT Matt Ellsworth)

- Trip Section events for AY26-2 for Firsties:
  - Bayway Refinery (POC: MAJ Lowell)

Absences

- Coordinate with course director FIRST, then program leadership
- Block leave period: 22 Dec – 4 Jan. 5 Jan is Reorgy, 6 Jan classes start (2-Day)

Upcoming Events

- Dept. Head's Reception: 09 Jan (1800-2100); ChemE slotted for 2000-2100.
- Dept. social: 20 March (1600-1800); S&F and cadets; CPT Golonski (Primary), CPTs Glinski, Stewart (Asst.)
- Block leave period: 22 Dec – 4 Jan. 5 Jan is Reorgy, 6 Jan classes start (2-Day)