UNITED STATES MILITARY ACADEMY
WEST POINT

Chemical Engineering

Course and Program AAR, AY25-1

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Agenda

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

CH350 AAR

- **Course average: 91.2%; TEE average: PENDING**

Sustain:

- ✓ **Detailed derivation of governing equation for bioreactors across various scenarios helped cadets understand how changes in mass balance occur.**
- ✓ **Focusing on kinetics from a biological perspective helped cadets understand the key differences between chemical engineering and biological approaches.**

Improve:

- ✓ **Continuous improvement of problems in the Problem Set, WPRs, and TEE is necessary to better align with the learning objectives.**
- ✓ **A stronger introduction to organic chemistry concepts in Block 1 is needed, as they are essential for understanding key bioengineering concepts later introduced in the textbook.**

CH363 AAR

- **Sustain: Capstone, NTU calculations**
- **Improve: Problems sets were the focus for this AY, improving/reviewing labs need to be the focus for next AY**
- **Do we want to re-energize the Bayway trip (or similar)? Do we have the connections still?**

CH365 AAR

- Response to AY24 course assessment:
  - Efficiencies found – rubric method – fillable forms for feedback; capstone IPR pass-fail. Used Wacom tablet to help with speed grading.
  - Excess Gibbs energy added to capstone.
  - Adjustments to course objectives completed.
- CDP: changed CDP to individual and used Perry's data instead of ebulliometer.
- Writing skills – several exercises on plotting.
- Writing assignment (sustain) – resumes, iterative. Cadets are uncomfortable saying what they have learned in their courses.
- Performance on exams was strong. Averages: WPRs 89.2% ± 11% compared to 85.5% ± 10% in AY23. TEE: 82.2 ± 15% versus 83.92 ± 8% in AY23.
- Course assessment incomplete as of 12-16-24. Blackboard surveys 100%. Tracking performance in FEE for thermo topic.
- Sustain change from last two years – rubric grading with resubmission. Forces cadets to examine homework to find mistakes. Cadets must make corrections to initial submission and describe what they did wrong.
- Videos added to lesson modules.
- Machine-learning exercises added to homework, capstone, and enrichment.

CH459 AAR

- WPR1 tests round robin 1 material & WPR2 tests round robin 2 material.
  - WPR1 Average = 78% (AY24-1: 86.2%)
  - WPR2 Average = 82% (AY24-1: 84.3%)
- SWE Executed as EXSUM on DIST for second AY in a row
- Same cadet groups for both round robins
- More emphasis on depth in controls: identify/choose one automatic control variable to conduct Laplace

Improve

- Emphasize first resort for cadets on sample calculations with full units and governing equations either in MMA or digital/handwritten notes before reverting to Excel.
- Despite emphasis on roles within groups, cadets minimized free energy and chose to not work on all aspects of lab deliverables. Impacts performance on WPRs & TEE.

Sustain

- 2 Instructors/section! Helps with coverage of topics and interaction with groups.
- Technical Communication in Unit Op Controls: Emphasis on P&IDs on Lucid Chart with automatic control loops and transfer of units by connecting to Laplace block
- Continue daily IPRs with groups and final graded IPR before submission – helps with final deliverable.

CH485 AAR

Previous changes maintained
Changes made 25-1
Recommended changes 26-1

- Course average: 87.96% (after TEE), AY23-1: 85.25%
- 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
- Increased number of problem sets to 10 (50 points each)
  - PS1 new; 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
  - Gave cadets previously collected data due to equipment maintenance issues
- Conduct thorough maintenance on lab apparatus
  - Delivered experimental data to cadets for Labs 4, 5, 6, and 7 due to equipment issues
  - Develop / re-start backup labs (membrane air separator, LL Extractor, WW column)

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 Hbook) 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 AY25-2!

ABET Accreditation

- Record Year AY26
- Self-Study Submitted 01JULY2026
- Program Evaluator Feedback from Visits Fall 2026 (AY27-1)
  - Appropriate engineering standards
  - Constituents of PEOs
  - Document waivers (irregularities for graduation)
  - Criterion 4: need to use direct indicators and algin indicators with outcomes
  - Address all "words" or "aspects of all student outcomes
  - Focus Areas: Bioengineering Electives for Majors, FEE Performance, and Program/Course Assessments

Advisory Board on 11APR25

- Dinner with Board members on 10APR25
- Meeting is on 1-Day on 11APR (Coordinate for support from ChemEs in CH101)
- Dr. Nagelli coordinating with board members & IPR with COL Burpo/COL James
- MAJ Tobergte (Primary) & CPT Golonski & CPT Rogers (Assistants)

Bioengineering Update

- Minor is live and approved!
- CH300, CH350, and CH450 seats for minor managed at program level.

AIChE Club (OIC: CPT(P) Lowell and CIC: CDT Eddie Chen)

- Trip Section events for AY25-2 for cadets in Club:
  - Bayway Refinery (POC: CPT(P) Lowell)
- Chocolate Club and Study Halls are going strong!