



ENGINEERING ACCREDITATION COMMISSION

### **Summary of Accreditation Actions**

2020–2021 Accreditation Cycle

United States Military Academy  
West Point, NY, United States

**Chemical Engineering (Bachelor of Science)**  
**Civil Engineering (Bachelor of Science)**  
**Electrical Engineering (Bachelor of Science)**  
**Engineering Management (Bachelor of Science)**  
**Environmental Engineering (Bachelor of Science)**  
**Mechanical Engineering (Bachelor of Science)**  
**Nuclear Engineering (Bachelor of Science)**  
**Systems Engineering (Bachelor of Science)**

Accredit to September 30, 2027. A request to ABET by January 31, 2026 will be required to initiate a reaccreditation evaluation visit. In preparation for the visit, a Self-Study Report must be submitted to ABET by July 1, 2026. The reaccreditation evaluation will be a comprehensive general review.



ENGINEERING ACCREDITATION COMMISSION

**UNITED STATES MILITARY  
ACADEMY**

WEST POINT, NY, UNITED STATES

**FINAL STATEMENT OF ACCREDITATION**  
2020-21 ACCREDITATION CYCLE

# UNITED STATES MILITARY ACADEMY

West Point, NY, United States

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ABET ENGINEERING ACCREDITATION COMMISSION

## FINAL STATEMENT

VISIT DATES: NOVEMBER 16-19, 2020

ACCREDITATION CYCLE CRITERIA: 2020-2021

## INTRODUCTION & DISCUSSION OF STATEMENT CONSTRUCT

The Engineering Accreditation Commission (EAC) of ABET has evaluated the Chemical Engineering (Bachelor of Science), Civil Engineering (Bachelor of Science), Electrical Engineering (Bachelor of Science), Engineering Management (Bachelor of Science), Environmental Engineering (Bachelor of Science), Mechanical Engineering (Bachelor of Science), Nuclear Engineering (Bachelor of Science), and Systems Engineering (Bachelor of Science) programs at the United States Military Academy.

The statement that follows consists of two parts: the first addresses the institution and its overall educational unit, and the second addresses the individual programs.

A program's accreditation action is based upon the findings summarized in this statement. Actions depend on the program's range of compliance or non-compliance with the criteria. This range can be construed from the following terminology:

- **Deficiency** A deficiency indicates that a criterion, policy, or procedure is not satisfied. Therefore, the program is not in compliance with the criterion, policy, or procedure.
- **Weakness** A weakness indicates that a program lacks the strength of compliance with a criterion, policy, or procedure to ensure that the quality of the program will not be compromised. Therefore, remedial action is required to strengthen compliance with the criterion, policy, or procedure prior to the next review.
- **Concern** A concern indicates that a program currently satisfies a criterion, policy, or procedure; however, the potential exists for the situation to change such that the criterion, policy, or procedure may not be satisfied.
- **Observation** An observation is a comment or suggestion that does not relate directly to the current accreditation action but is offered to assist the institution in its continuing efforts to improve its programs.

## INFORMATION RECEIVED AFTER THE REVIEW

- **Seven-Day Response** No information was received in the seven-day response period.
- **30- Day Due- Process Response** No information was received in the 30- day due- process

response period.

## INSTITUTIONAL SUMMARY

The United States Military Academy (USMA) at West Point, established in 1802, is the nation's oldest service academy and first school of engineering. The first graduates from this institution helped build the nation's infrastructure in the early 1800's. The West Point experience is designed to prepare cadets for leadership as commissioned officers on active duty in the U.S. Army through a 47-month comprehensive leader development process consisting of Character, Academic, Physical, and Military programs. Graduates have a long history of duty and service to the country.

The Academic Program of USMA consists of 13 academic departments, 37 academic majors, and 566 faculty members. This review evaluated eight engineering programs across six departments. These six departments have 217 faculty members, including 165 senior and rotating military faculty members and 52 civilian faculty members.

USMA has a total enrollment of 4,520 cadets, with 1,535 students across the six departments. There were 1,133 total graduates in the past year, including 550 from majors in the six departments. Academy graduates are awarded a Bachelor of Science degree and a commission as a second lieutenant in the U.S. Army, serving a minimum of five years on active duty. Enrollment was opened to women in 1976, and today women comprise 23 percent of cadets. Cadets are from all U.S. states and territories and represent all segments of society.

The following academic and support units were reviewed and found to adequately support the engineering programs: chemistry, mathematics, physics, physical geography, library, and student assistance center.

## INSTITUTIONAL STRENGTHS

1. Faculty members have diverse backgrounds and mentor and train students in distinctive ways. There are military and civilian faculty members. Military faculty members include both permanent and rotating members. Permanent military faculty are officers assigned to USMA. Rotating military faculty are career Army officers who attend civilian universities to earn an advanced degree followed by three-year tours at USMA to teach and conduct research. After their tour, they return to the Army for other assignments. Recently a conventional academic tenure system was established for civilian faculty, who provide breadth and depth of experience and expertise to their respective programs. The range of faculty members contribute in synergistic and supportive ways to all aspects of the leader development and career paths of cadets. USMA is ranked #1 by the Princeton Review for Most Accessible Professors.
2. A culture of improvement is intrinsic to the institution and evident in all programming and efforts, including a modernization effort known as USMA 2035. Through this effort, USMA will modernize its academic, military, and physical development facilities, capabilities, and infrastructure. An academic infrastructure upgrade includes the new Cyber and Engineering Academic Center (CEAC) planned to begin construction in FY21. CEAC will modernize USMA's engineering, technology, and cyber education capabilities. This 136,000 square-foot building

will house engineering laboratories for the Civil and Mechanical Engineering, Electrical Engineering and Computer Science, and Systems Engineering departments and include various spaces and advanced capabilities. CEAC will facilitate interdisciplinary work across academic disciplines to create the innovative training and education needed for a modern, technical Army.

# Chemical Engineering

## Bachelor of Science Program

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Evaluated under EAC Program Criteria for  
Chemical, Biochemical, Biomolecular and Similarly Named Engineering Programs

### INTRODUCTION

The Chemical Engineering (Bachelor of Science) program is administratively housed in the Department of Chemistry and Life Sciences. The department has 36 faculty members, 12 of whom provide instruction for the program. Of these, one full professor, three associate professors, and five assistant professors have doctoral degrees in chemical engineering, and three instructors have master's degrees. The program enrolled 57 students during fall 2020 and produced 30 graduates during the 2019-20 academic year.

### PROGRAM STRENGTH

The chemical engineering field has become increasingly dependent on simulation to test process conditions to ensure safe operation and to optimize process yield. The program utilizes a powerful simulation package, PetroSkills, for training students in plant operation. The software tool lets students visualize an actual process in real-time operation that gives them experience in process control and plant operations. Although process simulation tools such as Aspen and ChemCAD are common, these tools often represent steady state and only provide mass and energy balance information. PetroSkills offers a fully transient simulation of an operating process that allows students to function as a plant engineer to immediately see the impact of their decisions.

**No deficiencies, weaknesses, or concerns were found.**

# Civil Engineering

## Bachelor of Science Program

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Evaluated under EAC Program Criteria for  
Civil and Similarly Named Engineering Programs

### INTRODUCTION

The Civil Engineering (Bachelor of Science) program was initially accredited in 1985 and is housed in the Department of Civil and Mechanical Engineering. USMA is the oldest educational institution in the United States to offer formal academic instruction in the field of civil engineering. No advanced degrees are offered, and all graduating civil engineers complete the program in four years. There are 23 full-time faculty members (16 military and seven civilian) with rotation in ten of the military positions approximately every three years. All but seven members of the faculty are licensed professional engineers, and 65 percent possess a civil engineering related doctorate. The program currently enrolls 145 students and produced 33 graduates in the 2019-20 academic year.

### PROGRAM STRENGTHS

1. All new faculty in the program are required to participate in the Instructor Summer Workshop (ISW) jointly run by the civil and mechanical engineering programs. The workshop is a formal, collaborative experience designed to provide new faculty with the education and training to allow them to serve effectively as faculty members. The result is that new faculty are rapidly integrated into the culture and teaching style of the program at West Point. New faculty stated that the ISW provided them confidence in teaching and prepared them for success once they started their first fall at the Academy.
2. The Center for Innovation and Engineering is a center within the Department of Civil and Mechanical Engineering. Its purpose is to develop strong ties with the numerous agencies and laboratories within the Department of Defense, other federal agencies, and industry. Through these ties, the Center annually secures interdisciplinary design projects for the capstone design program and coordinates independent study projects and summer internships. The design projects provide three benefits to the program. First, they enhance the educational experience of the students by providing real-world, open-ended projects. Students gain experience from the interactions with engineering staff from the funding organizations. Second, faculty have an opportunity for professional development and outreach by working directly with new technologies being developed and engineering challenges faced by the funding organizations. Third, the program has leveraged the revenue from these projects to fund additional faculty positions.

**No deficiencies, weaknesses, or concerns were found.**

# Electrical Engineering

## Bachelor of Science Program

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Evaluated under EAC Program Criteria for  
Electrical, Computer, Communications, Telecommunication(s) and Similarly Named Engineering  
Programs

### INTRODUCTION

The Electrical Engineering (Bachelor of Science) program is housed in the Department of Electrical Engineering and Computer Science. The program currently enrolls 58 students and produced 17 graduates during the 2019-20 academic year. There are 23 faculty members. Fourteen staff members are shared among four programs in the department. The program offers the following five specialization areas: alternative energy, communications, cyber engineering, optical electronics, and robotics.

### PROGRAM STRENGTHS

1. The department leadership utilizes both senior civilian and military faculty to provide cultural and instructional leadership. These faculty members support faculty recruitment and on-boarding along with curriculum review after each semester. This enables the faculty as a whole to contribute to curriculum development and extensive and effective continuous improvement, resulting in a strong academic program focused on student outcomes and the methods to achieve them.
2. The laboratory and hands-on experiences are supported with excellent laboratory equipment and materials. Combined with high levels of faculty availability and faculty- student interaction, these laboratory experiences enhance student learning about concepts taught in lecture and how those concepts are applied in practice. The laboratory environment and faculty interaction provide many real-world, professional engineering experiences and help students achieve success.

**No deficiencies, weaknesses, or concerns were found.**



# Engineering Management

## Bachelor of Science Program

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Evaluated under EAC Program Criteria for  
Engineering Management and Similarly Named Engineering Programs

### INTRODUCTION

The Engineering Management (Bachelor of Science) program was first accredited in 1985. The program is administered by the Department of Systems Engineering. The program has 140 students, eight faculty members, and eight support staff members. The program awarded 47 bachelor's degrees in the 2019-20 academic year.

### PROGRAM STRENGTHS

1. Cadets in the program's two-semester culminating design sequence work with real-world clients on projects that span an array of U.S. Army and private industry applications and usually involve team members from multiple programs. During the sequence, each team submits its project to the General Donald R. Keith Memorial Capstone Conference, a peer reviewed competitive conference. These experiences help students to connect course work with real-world problems and to communicate their designs to external audiences.
2. All new instructors complete a six-week Faculty Development Workshop provided by the department prior to their first teaching experience. Instructors new to the program are paired with course directors to foster mentoring and continuity. The robust training combined with faculty rotation leads to a high-quality educational experience for students and a dynamic, energizing environment for faculty.

**No deficiencies, weaknesses, or concerns were found.**

# Environmental Engineering

## Bachelor of Science Program

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Evaluated under EAC Program Criteria for  
Environmental and Similarly Named Engineering Programs

### INTRODUCTION

The Environmental Engineering (Bachelor of Science) program is administered in the Department of Geography and Environmental Engineering. The program has an enrollment of 47 students and 14 full-time faculty members. Faculty in the program also teach students in the Environmental Science program, the environmental engineering core engineering sequence, and the core physical geography course (EV203). Nine students graduated in the 2019-20 academic year.

### PROGRAM STRENGTHS

1. The curriculum provides learning experiences in core and breadth areas of the environmental engineering discipline. Supporting courses complement the core course offerings. Design content is distributed throughout the environmental engineering course content. The flexibility to use partial lab content in lecture courses (for which 0.5 credit hour is included in the credits earned for these courses) is used to enhance the classroom learning. The program's curriculum coordinator oversees the integration of course content to ensure that critical content flows from science-based courses into the engineering courses. The organization of the curriculum provides an array of opportunities to engage students.
2. The program provides very good support for new instructors coming into the program. The New Instructor Training program introduces new instructors to campus traditions and requirements, the curriculum, and both training and practice in teaching the courses in the curriculum. The instructor training program enhances the quality of instruction and the learning experience for cadets.

**No deficiencies, weaknesses, or concerns were found.**

# Mechanical Engineering

## Bachelor of Science Program

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Evaluated under EAC Program Criteria for  
Mechanical and Similarly Named Engineering Programs

### INTRODUCTION

The Mechanical Engineering (Bachelor of Science) program was first accredited in 1985 and is housed in the Department of Civil and Mechanical Engineering. The program currently enrolls 230 students and has 29 faculty members. The program produced 76 graduates during the 2019-20 academic year.

### PROGRAM STRENGTHS

1. All new faculty members in the program are required to participate in the Instructor Summer Workshop (ISW) jointly run by the civil and mechanical engineering programs. The workshop is a formal, collaborative experience designed to provide new faculty with the education and training to serve effectively as faculty members. The result is that new faculty are rapidly integrated into the culture and teaching style of the mechanical engineering program at West Point. New faculty stated that the ISW provided them confidence in teaching and prepared them for success once they started their first fall at the Academy.
2. The Center for Innovation and Engineering is a center within the Department of Civil and Mechanical Engineering. Its purpose is to develop strong ties with the numerous agencies and laboratories within the Department of Defense, other federal agencies, and industry. Through these ties, the Center annually secures interdisciplinary design projects for the capstone design program and coordinates independent study projects and summer internships. The design projects provide three benefits to the program. First, they enhance the educational experience of the students by providing real-world, open-ended projects. Students also gain experience from the interactions with engineering staff from the funding organizations. Second, faculty have an opportunity for professional development and outreach by working directly with new technologies being developed and engineering challenges faced by the funding organizations. Third, the program has leveraged the revenue from these projects to fund additional faculty positions.

**No deficiencies, weaknesses, or concerns were found.**

# Nuclear Engineering

## Bachelor of Science Program

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Evaluated under EAC Program Criteria for  
Nuclear, Radiological, and Similarly Named Engineering Programs

### INTRODUCTION

The Nuclear Engineering (Bachelor of Science) program is administered by the Department of Physics and Nuclear Engineering. The program has 57 students, nine full-time faculty members, three part-time faculty members, one full-time professional staff member, and nine part-time professional staff members. The program awarded 17 bachelor's degrees in the 2019-20 academic year.

### PROGRAM STRENGTHS

1. This program introduces the use of computing early in the curriculum and uses it frequently at later stages. The dual-screen layout in the computing classroom is unique, providing instant feedback regarding student progress during class. In addition, their computational design course employs practical computing tools in a novel way. These innovations will help students apply the course content in practical settings.
2. This program offers a robust training program for instructors. All new instructors participate in a six-week, department-wide instructor training program that includes a discussion of modern pedagogical approaches and practice teaching. Considering the rotation of many instructors in this program, the training ensures the quality of teaching in all courses.

**No deficiencies, weaknesses, or concerns were found.**

# Systems Engineering

## Bachelor of Science Program

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Evaluated under EAC Program Criteria for  
Systems and Similarly Named Engineering Programs

### INTRODUCTION

The Systems Engineering (Bachelor of Science) program was established with the Department of Systems Engineering in 1989. There are 10 faculty members and eight staff members directly aligned with the program. Six faculty members are military officers on permanent or rotating assignment to USMA, and four faculty members are civilian employees. The program currently enrolls 129 students and produced 69 graduates during the 2019-20 academic year.

### PROGRAM STRENGTHS

1. The program uses principles and practices from the discipline of systems engineering for continuous improvement. This provides an active application of explore/exploit: exploit that which works well and explore for better ways. This engages the cadets in new learning activities as well as in a proactive process for making a good cadet learning experience into a better experience.
2. A culture of continual positive change is fostered through several channels, including the program's advisory board, the course feedback process, planned faculty rotation, and USMA's willingness to push the edge. These channels provide the program director with many ideas for controlled change, or change with purpose. These changes manifest in new teaching methods, new capstone focus areas, and new knowledge and skills to enhance the cadet's learning experience.
3. The program guides qualified and interested graduates into master's degree programs from which they return as faculty members under a planned rotation cycle. These officers eventually return to military duty after serving on the faculty. This arrangement provides a continual causal feedback loop of returning graduates, thus helping to realize student outcomes and increasing the quality of the learning experience.

**No deficiencies, weaknesses, or concerns were found.**