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Academic Year  
**2022 - 2023**

Environmental Studies

# Energy Management and Building Science

Biological, Health and  
Environmental Sciences Division  
Kirsch Center, Room 228  
408-864-8773

Find your counselor at  
deanza.edu/our-counselors

Please visit the Counseling and Advising Center to apply for degrees and for academic planning assistance.

### Certificate of Achievement Requirements

- Completion of all major courses with a C grade or higher.

Note: A maximum of six quarter units may be transferred from other academic institutions.

### Certificate of Achievement-Advanced Requirements

- Completion of all major courses with a C grade or higher.
- Demonstrated proficiency in English and mathematics as evidenced by eligibility for EWRT 1A, EWRT 1AH, EWRT 1AS with EWRT 1AT, or ESL 5 and eligibility for MATH 114.

Note: A maximum of 18 quarter units may be transferred from other academic institutions.

### A.A./A.S. Degree Requirements

1. Completion of all General Education (GE) requirements (32-43 quarter units) for the A.A./A.S. degree. GE units must be completed with a minimum 2.0 GPA (C average).
  2. Completion of all major courses with a C grade or higher. Major courses can also be used to satisfy GE requirements (except for Liberal Arts degrees).
- Note: A maximum of 22 quarter units from other academic institutions may be applied toward the major.
3. Completion of a minimum of 90 degree-applicable quarter units (GE and major units included). All De Anza courses must be completed with a minimum 2.0 GPA (C average). All De Anza courses combined with courses transferred from other academic institutions must be completed with a minimum 2.0 GPA (C average).

Note: A minimum of 24 quarter units must be earned at De Anza College.

## Energy Management and Building Science Certificate of Achievement

The Certificate of Achievement in Energy Management and Building Science will prepare students for new and emerging career opportunities in energy management technology, building energy audit, facilities management, building design and sustainability and renewable energy systems. Completion of the Certificate of Achievement provides an introduction to energy efficiency techniques and principles and prepares students for careers in managing and monitoring energy efficient buildings. The certificate curriculum is aligned with professional certifications offered by the International Facilities Management Association (IFMA), including Facilities Management Professional (FMP) and Sustainable Facilities Professional (SFP). Students will also be well prepared for the certification test for Renewable (Solar) Energy Professional offered by the North American Board of Certified Energy Practitioners (NABCEP).

*Program Learning Outcomes: Upon completion, students will be able to*

- Investigate and analyze energy use and its relationship to non-renewable energy extraction, production, distribution, consumption and greenhouse gas emissions
- Apply an understanding of energy management and building science principles, techniques and strategies, the laws of thermodynamics and the sustainable use of resources supporting the built environment

1. Meet the requirements for this certificate level.
2. Complete the following.

ES 4	Energy, the Environment, and Society	4
ES 58	Introduction to Green Building	1
ES 64	Climate Change Mitigation and Adaptation in California	4
ES 69	Energy Management Within Your Organization	1
ES 70	Introduction to Energy	1
ES 71	Introduction to Sustainable Buildings	1
ES 76	Energy Star Products	1
ES 78	Introduction to Energy Management Systems and Controls	1
ES 79	Renewable and Alternative Energy Systems	1
ES 81	Leadership in Energy and Environmental Design/Sustainability Codes	2
ES 82	Project Management and Technical Report Writing for Energy Professionals	2
ES 83	Energy Management Return on Investment	2
	<b>Total Units Required</b>	<b>21</b>

## Energy Management and Building Science

### Certificate of Achievement-Advanced

The Certificate of Achievement-Advanced in Energy Management and Building Science will prepare students for new and emerging career opportunities in energy management technology, building energy audit, facilities management, building design and sustainability and renewable energy systems. Completion of the Certificate of Achievement-Advanced provides an intermediate level of analysis in energy efficiency principles and prepares students for careers in managing and monitoring energy efficient buildings. The certificate curriculum is aligned with professional certifications offered by the International Facilities Management Association (IFMA), including Facilities Management Professional (FMP) and Sustainable Facilities Professional (SFP). Students will also be well prepared for the certification test for Renewable (Solar) Energy Professional offered by the North American Board of Certified Energy Practitioners (NABCEP).

*Program Learning Outcomes: Upon completion, students will be able to*

- Investigate and analyze energy use and its relationship to non-renewable energy extraction, production, distribution, consumption and greenhouse gas emissions
- Apply an understanding of energy management and building science principles, techniques and strategies, the laws of thermodynamics and the sustainable use of resources supporting the built environment
- Demonstrate knowledge of the above objectives and strategically conceptualize and implement efficient and sustainable energy management policies, procedures and systems in residential and commercial buildings

1. Complete the Certificate of Achievement requirements. 21
2. Meet the requirements for this certificate level.
3. Complete the following.

ES 51A	Sustainable Energy Systems	4
ES 51B	Energy Efficient Buildings	3
ES 51C	Building Automation Systems	2
ES 69A	Introduction to Facilities Management	3
ES 76A	Solar Thermal Systems	1
<b>Total Units Required .....</b>		<b>34</b>

## Energy Management and Building Science

### A.S. Degree

The A.S. degree in Energy Management and Building Science will prepare students for new and emerging career opportunities in energy management technology, building energy audit, facilities management, building design and sustainability and renewable energy systems. Completion of the degree program provides students with a skilled knowledge of energy efficiency principles and prepares them for careers in managing and monitoring energy efficient buildings. The program curriculum is aligned with professional certifications offered by the International Facilities Management Association (IFMA), including Facilities Management Professional (FMP) and Sustainable Facilities Professional (SFP). Students will also be well prepared for the certification test for Renewable (Solar) Energy Professional offered by the North American Board of Certified Energy Practitioners (NABCEP).

*Program Learning Outcomes: Upon completion, students will be able to*

- Investigate and analyze energy use and its relationship to non-renewable energy extraction, production, distribution, consumption and greenhouse gas emissions
- Apply an understanding of energy management and building science principles, techniques and strategies, the laws of thermodynamics and the sustainable use of resources supporting the built environment
- Demonstrate knowledge of the above objectives and strategically conceptualize and implement efficient and sustainable energy management policies, procedures and systems in residential and commercial buildings
- Engage with key stakeholders in energy management and building science occupations including the public, government agencies, public industry, manufacturing and non profits to enhance, improve and advocate for global, cultural, social and environmental health and well being

1. Complete the Certificate of Achievement and the Certificate of Achievement-Advanced requirements. 34
2. Meet the A.A./A.S. degree requirements.
3. Complete the following.

### Complete 18 units: 18

CIS 3	Business Information Systems (4.5)
CIS 79	Managing Technology Projects (4.5)
ES 1	Introduction to Environmental Studies (4)
ES 50	Introduction to Environmental Resource Management and Pollution Prevention (4)
ES 61B	Environmental Resource Management and Pollution Prevention: Energy, Chemicals and Waste (4)
ES 62C	Environmental Management Tools: Environmental Site Assessments (ESAs) (4)
ES 62D	Environmental Management Tools: Industrial Ecology and Sustainable Design Principles (4)
ES 84	Residential Solar Design and Installation (1)
ES 95	Introduction to Environmental Careers (1)
ESCI 1	Environmental Science (4)
MATH 109	Intermediate Algebra for Statistics (5)
or MATH 114	College Math Preparation Level 3: Intermediate Algebra (5)
or MATH 130	Intermediate Algebra for Precalculus (5)
MET 10	Weather and Climate Processes (5)
PHYS 10	Concepts of Physics (5)

<i>Major</i>	<i>Energy Management and Building Science</i>	52
<i>GE</i>	<i>General Education (32-43 units)</i>	
<i>Electives</i>	<i>Elective courses required when the major units plus GE units total is less than 90 units</i>	
<b>Total Units Required .....</b>		<b>90</b>