

21250 Stevens Creek Blvd. Cupertino, CA 95014 408-864-5678 www.deanza.edu

Energy Management and Building Science *Certificate of Achievement*

The Certificate of Achievement - 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 and 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).

Student 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.

E S 58	Introduction to Green Building	1
E S 69 E S 70	Energy Reliability and Your Organization	1
2070	Technology	1
E S 70B	Advanced Energy Management Technology	2
E S 71	The Building Envelope	1
E S 72	Heating, Ventilating and Air Conditioning	
	(HVAC) Systems	1
E S 72B	Advanced Heating, Ventilating and Air	
	Conditioning (HVAC) Systems	2
E S 74	Lighting Distribution Systems	1
E S 75	Electric Power Systems	1
E S 75B	Advanced Electric Power Systems	2
E S 78 E S 81	Energy Management Systems and Controls Leadership in Energy and Environmental	1
	Design / Sustainability Codes	2
E S 82	Proj Management and Technical Reports	2
E S 95B	Environmental Studies Internship	2
Total Units Required		

Energy Management and Building Science Certificate of Achievement-Advanced

The Certificate of Achievement-Advanced 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).

Student 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. 20
- 2. Meet the requirements for this certificate level.
 - 3. Complete the following.

E S 64	AB 32 (CA Global Warming	
	Solutions Act of 2006)	1
E S 71B	Advanced Building Envelope	2
E S 74B	Advanced Lighting Distribution Systems	2
E S 76	Energy Star Products	1
E S 76A	Solar Thermal Systems	1
E S 78B	Advanced Energy Management Systems	
	and Controls	2
E S 79	Renewable and Alternative Energy Systems	1
E S 83	Energy Management Return on Investment	2
E S 84	Residential Solar Design and Installation	1
Total Units Required		

Energy Management and Building Science A.S. Degree

The Associate in Science Degree - 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).

Student 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.
- 2. Meet the A.A./A.S. degree requirements.
- 3. Complete the following.

Complete 17 units:

17

33

Introduction to Environmental Studies (4)	
Environmental Resource Management	
and Pollution Prevention: Air, Water	
and Land (3)	
Environmental Management Tools: CEQA	
and Environmental Impact Report (EIRs) (3)	
Environmental Management Tools:	
Industrial Ecology and Sustainable	
Design Principles (3)	
Environmental Leadership (1)	
Introduction to Environmental Careers (1)	
Environmental Studies Internship (1)	
Environmental Studies Internship (3)	
Environmental Studies Internship (4)	
Environmental Science (4)	
Introduction to Photovoltaic (PV)	
Technology (3)	
College Math Preparation Level 3:	
Intermediate Algebra (5)	
Weather and Climate Processes (5)	
Concepts of Physics (5)	
Energy Management and Building Science	50
General Education (31-42 units)	
Elective courses required when major	
units plus GE units total is less than 90	
Total Units Required	.90
	Introduction to Environmental Studies (4) Environmental Resource Management and Pollution Prevention: Air, Water and Land (3) Environmental Management Tools: CEQA and Environmental Impact Report (EIRs) (3) Environmental Management Tools: Industrial Ecology and Sustainable Design Principles (3) Environmental Leadership (1) Introduction to Environmental Careers (1) Environmental Studies Internship (1) Environmental Studies Internship (3) Environmental Studies Internship (3) Environmental Studies Internship (4) Environmental Science (4) Introduction to Photovoltaic (PV) Technology (3) College Math Preparation Level 3: Intermediate Algebra (5) Weather and Climate Processes (5) Concepts of Physics (5) Energy Management and Building Science General Education (31-42 units) Elective courses required when major units plus GE units total is less than 90 Total Units Required

2016-2017 DE ANZA COLLEGE

CATALO

E S 82	Project Managment and Technical Rep	port	
	Writing for	Energy Professionals	2
E S 95B	Environmental Studies Internship	2	
	Total Unit	s Required	

Energy Management and Building Science

Certificate of Achievement-Advanced

The Certificate of Achievement-Advanced 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 (EMA) including Eacilities Professional (SER)

(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).

Student 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 knoweldge 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. 20
- 4. Meet the requirements for this certificate level.
- 5. Complete the following.

AB 32 (CA Global Warming		
Solutions Act of 2	2006)	1
Advanced Building Envelope	2	
Advanced Lighting Distribution Systems	2	
Energy Star Products	1	
Solar Thermal Systems	1	
Advanced Energy Management Systems		
and Controls		2
Renewable and Alternative Energy Systems	1	
Energy Management Return on Investment	2	
Residential Solar Design and Installation	1	
Total Units Req	uired	33
	AB 32 (CA Global Warming Solutions Act of Advanced Building Envelope Advanced Lighting Distribution Systems Energy Star Products Solar Thermal Systems Advanced Energy Management Systems and Controls Renewable and Alternative Energy Systems Energy Management Return on Investment Residential Solar Design and Installation Total Units Req	AB 32 (CA Global Warming Solutions Act of 2006) Advanced Building Envelope 2 Advanced Lighting Distribution Systems 2 Energy Star Products 1 Solar Thermal Systems 1 Advanced Energy Management Systems and Controls Renewable and Alternative Energy Systems 1 Energy Management Return on Investment 2 Residential Solar Design and Installation 1 Total Units Required

Energy Management and Building Science

A.S. Degree

The Associate in Science Degree - 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).

Student 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.
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- demonstrate knoweldge 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 envrionmental health and well being

17

- 1. Complete the Certificate of Achievement and the
Certificate of Achievement-Advanced requirements.33
- 2. Meet the A.A./A.S. degree requirements.
- 3. Complete the following.

Complete 17 units:

E S 1 E S 61A	Introduction to Environmental Studies (4) Environmental Resource Management and Pollution Prevention: Air, Water and L and (3)	
E S 62B	Environmental Management Tools: CEQA and Environmental Impact Report (EIRs) (3)	
E S 62D	Environmental Management Tools: Industrial Ecology and Sustainable Design Principles (3)	
E S 66	Environmental Leadership (1)	
E S 95	Introduction to Environmental Careers (1)	
E S 95A	Environmental Studies Internship (1)	
E S 95C	Environmental Studies Internship (3)	
E S 95D	Environmental Studies Internship (4)	
ESCI 1	Environmental Science (4)	
ESCI 61	Introduction to Photovoltaic (PV) Technology (3)	
MATH 114	College Math Preparation Level 3: Intermediate Algebra (5)	
MET 10	Weather and Climate Processes (5)	
PHYS 10	Concepts of Physics (5)	
Major GE Electives	Energy Management and Building Science General Education (31-42 units) Elective courses required when major units plus GE units total is less than 90	50
	Total Units Required	90