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Academic Year **2016-2017**

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 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).

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.

- Meet the requirements for this certificate level.
- Complete the following.

E S 58	Introduction to Green Building	1
E S 69	Energy Reliability and Your Organization	1
E S 70	Introduction to Energy Management 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	Energy Management Systems and Controls	1
E S 81	Leadership in Energy and Environmental Design / Sustainability Codes	2
E S 82	Proj Management and Technical Reports	2
E S 95B	Environmental Studies Internship	2

Total Units Required 20

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.

- Complete the Certificate of Achievement requirements. 20
- Meet the requirements for this certificate level.
- 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		33

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. 33
2. Meet the A.A./A.S. degree requirements.
3. Complete the following.

Complete 17 units: 17

E S 1	Introduction to Environmental Studies (4)
E S 61A	Environmental Resource Management and Pollution Prevention: Air, Water and Land (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)

<i>Major</i>	<i>Energy Management and Building Science</i>	<i>50</i>
<i>GE</i>	<i>General Education (31-42 units)</i>	
<i>Electives</i>	<i>Elective courses required when major units plus GE units total is less than 90</i>	
Total Units Required.....		90