ENERGY MANAGEMENT AND BUILDING SCIENCE COURSE DECRIPTIONS

Effective September 2018 (Required Courses Only)

Certificate of Achievement (COA)

ES 4- Energy, the Environment, and Society (4 Units- 48 Hours Lecture)- Many issues faced in the world we live in are the result of the extraction, production, transmission, distribution and consumption of energy. Energy and its negative impacts know no social, economic, cultural, racial, gender, religious, political, geographic or environmental boundaries. This course examines how our energy demands and its ramifications affect everyone on the planet.

ES 58- Introduction to Green Buildings- (1 unit- 12 Hours Lecture)- An overview of strategies to implement a green building project within your organization. The strategies include model green building policy and guidelines including, sustainability principles, passive solar design, assembling a green team, assessing the impact of construction and buildings on society, and an overview of key stakeholders in the construction field.

ES 64- California's Approach to Global Warming/Global Climate Change (2 Units- 24 Hours Lecture)- Examines the various strategies and approaches being taken at the state and local levels to address both the root causes and the anticipated effects of global warming/global climate change. Particular emphasis is placed on examining implementation of state law AB32, California's Global Warming Solutions Act. Explores associated job and career opportunities in helping to address global warming/global climate change.

ES 69- Energy Management Within Your Organization (1 Unit- 12 Hours Lecture)- An overview of strategies to assist in preparing an energy management action plan for your organization and staff. Course covers how Measurement &Verification relates to the audit process, M&V planning, measurement boundaries, data collection tools and methods, savings calculations. Strategies include model board policy, administrative guidelines, assembling an energy management action team, assessing the impact of energy policy on society, and an overview of key stakeholders in the energy field.

ES 70- Introduction to Energy- (1 Unit- 12 Hours Lecture)-Provides a general overview of the field of Energy Management and its importance to society at all levels. In particular, the evaluation, operation, and maintenance of energy systems in residential and small commercial buildings will be looked at, including alternative and renewable energy sources, in order to improve efficiency, reduce costs, and minimize environmental impacts.

ES 71- Introduction to Sustainable Buildings (1 Unit- 12 Hours Lecture) -Presents a general overview of Energy Efficient Buildings with an emphasis on residential and small commercial buildings. Specific topics to be covered include: energy use in buildings, bio-climatic design, energy basics, heat transfer concepts, whole building thermal analysis, as well as other important building energy efficient issues.

ES 76- Energy Star Products (1 Unit- 12 Hours Lecture)-An introduction to Energy Star products including high efficiency, high performance commercial, industrial and residential equipment and appliances that reduce energy consumption and save money.

ES 78- Introduction to Energy Management Systems and Controls (1 Unit- 12 Hours Lecture)- Describes the most commonly used controls and energy management systems in commercial and institutional applications. Topics will include complex automatic systems for major energy-consuming equipment, as well as simple controls, including time clocks, occupancy sensors, photocells, and programmable thermostats. Computer-based energy management systems, as well as control systems to reduce peak electrical demand will be discussed.

ES 79- Renewable and Alternative Energy Systems (1 Unit- 12 Hours Lecture- An introduction to the potential for renewable and alternative energy systems when adding power generation capacity for a site or large facility. Life-cycle cost comparisons between renewable energy systems and conventional power generation and the added potential of reducing peak power demand will be emphasized. Topics include photovoltaic power systems, wind energy systems, and fuel cells.

ES 81- Leadership in Energy and Environmental Design/Building Codes (2 Units, 24 Hours Lecture)-This introductory course is designed for students and employees seeking to learn more about green building and how it can benefit their company. Topics covered will include the triple bottom line of sustainability, current market trends in green building, the Building Energy Code (Title 24, section 6), Appliance Code (Title 20), and the Green Building Code (Title 24, section 11). The class will include modules on simulation tools that can be used for code compliance, analysis of the potential impact for specific EE and DR measures, verification of energy savings efforts, and the process of greening existing energy portfolios.

ES 82-Project Management and Technical Report Writing- (2 Units- 18 Hours Lecture; 6 Hours Lab)- This course is focused on effective program and project management and writing compelling and accurate technical reports of audit findings for a non-technical audience. Course covers elements, formats, templates, structure, and graphics to support findings and to build a compelling and winning proposal.

ES 83-Energy Management Return on Investment- (2 Units- 24 Hour Lecture)-Course explores utility rate types and charges. Building benchmarking tools such as Energy Star Portfolio Manager. Methods for estimating costs, and calculating the financial benefits of recommended energy efficiency projects. Course includes examination of effective report generation and strategies to address internal decision makers.

Certificate of Achievement- Advanced (COA-A)

ES 51A- Sustainable Energy Systems (4 Units- 36 Hours Lecture, 36 Hours Lab)-Prerequisites- ES 70 and ES 79 Examines Energy Management Technology and the importance and applications of building performance, controls and monitoring using the Kirsch Center for Environmental Studies and other campus-wide buildings in a lab setting. An understanding of electric power, the electric power industry and the economics of distributed energy resources is

provided in the course. The essential characteristics of traditional and renewable energy systems such as wind, solar and fuel cells will also be examined.

ES 51B- Energy Efficient Buildings (3 Units-24 Hours Lecture, 36 Hours Lab)-Prerequisite-ES 71 - A general overview of Energy Efficient Buildings with an emphasis on residential and small commercial buildings is presented in this course. Specific topics to be covered include: energy use in buildings, bio-climatic design, indoor environmental quality, heat transfer concepts, load and energy calculations, HVAC systems and equipment, and natural and artificial lighting. A hands-on lab component will accompany the lecture presentations.

ES 51C- Building Automation Systems- (2 Units- 12 Hours Lecture, 36 Hours Lecture)-Prerequisite ES 78 - Examines detailed strategies and principles for building operation systems and controls. Course covers building automation systems including IP based solutions and looks at the financial return on investment of implementing a building management and control system. The Kirsch Center for Environmental Studies and other campus-wide buildings as a learning laboratory will be utilized.

ES 69A- Introduction to Facilities Management (3 Units- 36 Hours Lecture)-This course will introduce key concepts of Facility Management that range from the role the facility manager plays in the organization to the skill sets and competencies required to effectively perform the job. This course will give the facility manager a greater appreciation for what they manage in the workplace and the typical challenges they face on a daily basis.

ES 76A- Solar Thermal Systems (1 Unit- 12 Hours Lecture)- An overview of solar thermal systems including water heating technologies which reduce energy use to generate hot water including maintaining equipment and insulation, reducing hot water use and water temperatures, reducing heat losses from the system, and utilizing waste heat sources and renewable energy technologies, including solar.