Prepared by the Department of Natural Sciences & Life Fitness
Date of Departmental Approval: February 15, 2017
Date Approved by Curriculum and Programs: March 1, 2017 Effective: Fall 2017

1. **Course Number: ENV170**
   Course Title: Renewable Energy Sources

2. **Description:** This course provides an overview of renewable energies including solar energy, wind power, hydropower, biomass, hydrogen, and fuel cells. Students learn basic principles of each technology for new and existing construction. They study government regulations, analyze renewable energy systems, calculate savings, backup energy, and financing options. They investigate the potentials of renewable energy technologies to help solve environmental and economic problems within society.

3. **Student Learning Outcomes (instructional objectives; intellectual skills):**
   Upon successful completion of this course, students are able to do the following:
   - Explain the basic design principles and technologies of renewable energy systems, and their benefits and limitations.
   - Investigate the potentials of renewable energy technologies to help solve environmental and economic problems.
   - Calculate a variety of cost and savings analyses, and comparative pollutant output and other environmental analyses of renewable energy systems.
   - Discuss concepts and issues related to the renewable energy industry (i.e. distributed generation, regulations, politics, economics, public perception, barriers, and employment opportunities.)

4. **Credits:** 3 credits

5. **Satisfies General Education Requirement:** No

6. **Prerequisites:** MAT020 (Prealgebra) or MAT025 (Pre-Algebra) and ENL108 (Critical Reading & Thinking) or satisfactory basic skills assessment scores

7. **Semesters Offered:** Fall, Spring, Summer

8. **Suggested General Guidelines for Evaluation:** Research paper, notebook/journal, exams

9. **General Topical Outline:**

   Introduction
   - Overview of the energy situation including environmental, political, and economic issues

   Energy efficiency and conservation strategies
   - Economic and environmental analyses for renewable energy systems

   Solar: Solar Thermal, Passive Solar, PV
   Wind Power
   Biomass and Bio-fuels
   Hydrogen, Fuel Cells, and the hydrogen economy:
   Marketing and Sales Skills for Renewable Energies
   - Financing options
   - Researching products

   Case Studies: Economic and Environmental Analyses for Sample Renewable Energy Systems
   State of the Industry
   - Barriers to implementation of renewable energies and how to overcome them
   - Jobs and skills requirements
   - Life in the energy business