I. Description of Course:

1. Department/Course: CNET - 114
2. Title: How Technology Works
3. Cross Reference:
4. Units: 4
   Lec Hrs: 3
   Lab Hrs: 3
5. Repeatability: No
6. Grade Options: Letter Grade, May Petition Credit/No Credit (GC)
7. Degree/Applicability: Credit, Degree Applicable, Transferable - CSU (T)
8. General Education:
9. Field Trips: May be Required
10. Requisites:
    Advisory: Eligible for ENGL-151B, ENGL-163, MATH-151
11. Catalog Description:
    This course is intended for students of all disciplines who are interested in how everyday things work. Introduction to some of the fundamental science concepts underpinning high technology, emphasizing everyday devices and practical experience, for the development of scientific and computer literacy. Students will experiment with technology to discover principles of science. Concepts such as force, work, energy, power, liquids and gasses, heat transfer, electricity, magnetism, electronics, light, materials science, and time are explored through experimentation and observation. Students will experience through class demonstrations and hands-on laboratories the concepts presented by the instructor. Phenomena such as how computers convert data, iPods transmit sound, electronic thermometers measure temperature, solar heating panels capture heat, and how GPSs use microwaves. A laboratory session is included which offers students a chance to do experiments. Field trips to local tech industry displays are required.

12. Class Schedule Description:
    Experiment with everyday technology to discover principles of science and engineering.

13. Counselor Information:
    This course was specifically developed for students interested in a two-year Associated Degree in a technology related field or transfer. The laboratory work is of a fairly demanding level and meets the requirements of University of California and State Universities for a Physical Science (lec/lab) general education transfer. Note: This course will be cross-referenced with ENGI 114.

II. Student Learning Outcomes
The student will:
1. Understand and apply scientific principles as used in common technological systems.
2. Formulate hypotheses and develop empirical knowledge based on observation, experimentation, and deconstruction.
3. Demonstrate increased science and technical literacy, including and increased technical vocabulary.
4. Identify the contributions of science and technology to everyday life.
5. Communicate technical ideas orally and in writing by interpreting graphical data, constructing graphs to communicate ideas, and evaluate the information content of Internet resources.
6. Construct technical information into a logical framework for decision making.
7. Establish a frame of mind where quantitative reasoning is embraced.
8. Work effectively in a group to solve complex problems.

III. Course Outline:

A. The Laws of Motion and the Mechanics of Movement.
   1. Falling Balls
   2. Ramps
   3. Seesaws
   4. Wheels
B. Simple Mechanical Objects
   1. Spring Scales
C. Heat
   1. Electric and Solar Heating
   2. Incandescent Light Bulbs
D. Electric and Magnetic Forces
   1. Electronic Air Cleaners
   2. Xerographic Copiers
   3. Magnetically Levitated Trains
E. Electrodynamics
   1. Flashlights
   2. Electric Power Distribution
   3. Tape Recorders
F. Electronics
   1. Audio Amplifiers
   2. Computers
G. Electromagnetic Waves
   1. Radio and Wireless Networks
   2. Television
   3. Microwave Ovens
H. Light
   1. Sunlight
   2. Fluorescent Lamps
   3. Lasers
   4. LED light emitters
I. Optics
   1. Cameras
   2. Eyeglasses
   3. Compact Disc Players
   4. Telescopes and Microscopes
J. Bio Physics
   1. Bio Sensors
   2. Bioelectric Phenomenon
   3. Medical Imaging and Radiation
K. Technology and the Environment
   1. Water Purification
   2. Pollution Control
   3. Alternative Fuels
L. Automation
   1. Robotics

IV. Course Assignments:
   A. Reading Assignments
      1. Textbook, web pages, and instructor handouts
   B. Projects, Activities, and other Assignments
      1. Hands-on labs, presentation of lab findings, field trips
   C. Writing Assignments
      1. Short term paper and lab write ups

V. Methods of Evaluation/Assessment:
   A. Objective quizzes and exams
   B. Performance-based assessments.

VI. Methods of Instruction:
   A. Lecture
   B. Laboratory

VII. Textbooks:
   Required
      ISBN: 039593873

   Optional

VIII. Supplies:

   CID 1903