

Course Outline

REVISED: July/2006



Course Description:

This competency-based course provides students with an introduction to the following scientific concepts and applications: scientific method, physiology, linear and circular motion, forces, and gravity, conservation of energy and momentum, light and optics, Earth's place in the universe, and solar radiation and structure and composition of the atmosphere. This course will give students an opportunity to develop skills using scientific equipment to collect, store, and analyze data. This course has been approved to satisfy the "g" (elective) subject area of the UC/CSU "a-g" requirements for freshman admission.

Program:

Adult Literacy/High School Diploma

Course of Study:

High School Diploma

Course:

1:2003 Science

36-10-54

General Science/Integrated 4

Credits: 5

Hours: 60

Prerequisites:

1. A minimum reading level of 9.0 as measured by the TABE D9/10 reading comprehension test
2. Successful completion of (31-02-70) Algebra 1/A and (36-10-53) General Science/Integrated 3
3. Recommendation of an instructor and/or a counselor

After a student has completed this course, he/she may not be allowed to re-enroll in the course.

A MESSAGE to COMPETENCY-BASED COURSE OUTLINE USERS

This competency-based course outline is for use by students, teachers, counselors and school administrators, advisory committees, and all others having interest in the course.

Before enrolling, students can read the course competencies listed to help them (students) decide whether or not the course will meet their needs. After enrolling, a copy of the competencies can help a student track his/her progress through the course.

Teachers can use competency-based areas and statements to gain an overview of the course. The competencies can be used to develop lesson plans and teaching strategies. The Instructional Materials and Other Resources page provides teachers with instructional support in the form of textbook titles, media and technology options, as well as the names of advisory personnel. Many course outlines provide sample lesson plans written by experienced teachers of the course.

Counselors can use the course outline to explain course purpose, goals and content to students. Sharing competency lists with students will make the students aware of the minimal skills and knowledge they need to demonstrate after taking the course. This process can identify potential candidates for a course.

Principals can scan the competency-areas and statements to decide if the content of a course should be offered at their school in order to meet the needs of the community which it serves.

Competencies can be used to generate relevant questions and items for tests. The writing of individualized instructional contracts also needs to reflect the competency-based course outline components.

Clearly defined competency-based areas, statements, and minimal competencies are the points upon which curriculum, instruction, and assessment focus.

THE DEVELOPMENT of a COMPETENCY-BASED COURSE OUTLINE

Every approved CBE course outline is written by Los Angeles Unified School teachers who teach the course. All teacher/writers have been inserviced and certified by the Adult Curriculum Office to learn about competency-based education and the outline format.

New courses and course revisions are initiated by school and/or central office subject area departments. The schools and the subject area departments share the responsibility for approving the subject content, hours, credits, etc. Teacher/writers submit their first draft to the appropriate central office subject area supervisor, specialist, consultant or adviser.

Course outline draft copies are next submitted to the curriculum office. There information required by the District and the State is verified. The outlines are edited and entered into the course outline computer data base. One formatted copy of an outline, with every page stamped "Draft Copy Only", is either approved by the curriculum office or returned for clarification or improvement.

Once signed off by the curriculum office an outline is routed back to the department that submitted it. When approved there, it is routed to the office of the Director of Instructional Services and finally to the Division's Assistant Superintendent for approval. The curriculum office then requests the required approvals by the LAUSD Board of Education.

The curriculum office sends master file copies of every approved CBE outline to principals of all Community Adult Schools and Employment Preparation Centers. These masters are used to reproduce copies for counselors and teachers. Students, community members, and other interested parties may also request copies. The curriculum office maintains a limited inventory of all outlines for additional distribution.

Changing needs are reflected in the constant development and revision of course outlines. It is an ongoing process designed to support the various demands of students, teachers, and the communities we serve.

TOM CALDERON
Adult Curriculum Office
Instructional and Counseling Services

CBE *COMPETENCY BASED EDUCATION*

Course Outline Competency-Based Component Definitions

Course descriptions state the major emphasis and content of the course.

Competency areas are units of instruction based on related competencies.

Competency statements are competency area goals that together define the framework and purpose of the course.

Competencies fall on a continuum between goals and performance objectives and denote outcome of instruction.

Competency-Based Philosophy Overview

Competency-based instruction tells a student before instruction what skills, or knowledge he/she will demonstrate after instruction.

A competency is stated as a minimum. This is the least a student has to demonstrate or know to be judged as competent. Stating competencies as minimums does not mean minimum instruction. Activities and opportunities should be provided for students to achieve maximum potential.

Competency-based education provides instruction that enables each student to attain individual goals as measured against pre-stated standards.

CBE instruction provides immediate and continual repetition and remediation. A student repeats tasks until achieving competence.

In competency-based education the curriculum, instruction, and assessment share common characteristics based on clearly stated competencies.

Curriculum, instruction and assessment in CBE are: explicit, known, agreed upon, integrated, performance-oriented, and adaptive.

COURSE OUTLINE COMPETENCY-BASED COMPONENTS

A course outline reflects the essential intent and content of the course described. Acceptable course outlines have six components. (Education Code Section 52506). Course outlines for all apportionment classes, including those in jails, state hospitals, and convalescent hospitals, contain the six required elements:

(EC 52504; 5CCR 10508 [b]; Adult Education Handbook for California [1977], Section 100)

Course Outline Components

Location

GOALS AND PURPOSES

Cover

The educational goals or purposes of every course are clearly stated and the class periods are devoted to instruction. The course should be broad enough in scope and should have sufficient educational worth to justify the expenditure of public funds.

The goals and purpose of a course are stated in the COURSE DESCRIPTION. Course descriptions state the major emphasis and content of a course, and are written to be understandable by a prospective student.

PERFORMANCE OBJECTIVES OR COMPETENCIES

pp. 7-10

Objectives should be delineated and described in terms of measurable results for the student and include the possible ways in which the objectives contribute to the student's acquisition of skills and competencies.

Performance Objectives are sequentially listed in the COMPETENCY-BASED COMPONENTS section of the course outline. Competency Areas are units of instruction based on related competencies. Competency Statements are competency area goals that together define the framework and purpose of a course. Competencies fall on a continuum between goals and performance objectives and denote the outcome of instruction.

Competency-based instruction tells a student before instruction what skills or knowledge they will demonstrate after instruction. Competency-based education provides instruction which enables each student to attain individual goals as measured against prestated standards.

Competency-based instruction provides immediate and continual repetition and In competency-based education the curriculum, instruction, and assessment share common characteristics based on clearly stated competencies. Curriculum, instruction and assessment in competency-based education are: explicit, known, agreed upon, integrated, performance oriented, and adaptive.

*COURSE OUTLINE COMPETENCY-BASED COMPONENTS
(continued)*

Course Outline Components Location

INSTRUCTIONAL STRATEGIES

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Instructional techniques or methods could include laboratory techniques, lecture method, small-group discussion, grouping plans, and other strategies used in the classroom.

Instructional strategies for this course are listed in the TEACHING STRATEGIES AND EVALUATION section of the course outline. Instructional strategies and activities for a course should be selected so that the overall teaching approach takes into account the instructional standards of a particular program, i.e., English as a Second Language, Programs for Older Adults, Programs for Adults with Disabilities.

UNITS OF STUDY, WITH APPROXIMATE HOURS ALLOTTED FOR EACH UNIT

Cover

The approximate time devoted to each instructional unit within the course, as well as the total hours for the course, is indicated. The time in class is consistent with the needs of the student, and the length of the class should be that it ensures the student will/earn at an optimum level.

pp. 7-10

Units of study, with approximate hours allotted for each unit are listed in the COMPETENCY AREA STATEMENT(S) of the course outline. The total hours of the course, including work-based learning hours (community classroom and cooperative vocational education) is listed on the cover of every CBE course outline. Each Competency Area listed within a CBE outline is assigned hours of instruction per unit.

EVALUATION PROCEDURES

p. 14

The evaluation describes measurable evaluation criteria clearly within the reach of the student. The evaluation indicates anticipated improvement in performances as well as anticipated skills and competencies to be achieved.

Evaluation procedures are detailed in the TEACHING STRATEGIES AND EVALUATION section of the course outline. Instructors monitor students' progress on a continuing basis, assessing students on attainment of objectives identified in the course outline through a variety of formal and informal tests (applied performance procedures, observations, simulations), paper and pencil exams, and standardized tests.

REPETITION POLICY THAT PREVENTS PERPETUATION OF STUDENT ENROLLMENT

Cover

After a student has completed all the objectives of the course, he or she should not be allowed to reenroll in the course. There is, therefore, a need for a statement about the conditions for possible repetition of a course to prevent perpetuation of students in a particular program for an indefinite period of time.

ACKNOWLEDGMENTS

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Thanks to TOM CALDERON for editing and preparing this course outline as competency-based.

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CALIFORNIA SCIENCE CONTENT STANDARDS
for the General Science/Integrated 4 Course

INVESTIGATION AND EXPERIMENTATION:

- 1.0 Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing this content in the other four strands, students should develop their own questions and perform investigations.
(a, b, c, d, e, f, g, h, i, j, k, l, m, n)

EARTH SCIENCE:

Earth's Place in the Universe

- 1.0 Astronomy and planetary exploration reveal the solar system's structure, scale, and change over time. (a, b, c, d, e, f)
- 2.0 Earth based and space based astronomy reveal the structure, scale, and changes in stars galaxies, and the universe over time. (a, b, d, f)

Energy in the Earth System

- 4.0 Energy enters the Earth system primarily as solar radiation and eventually escapes as heat. (a, b, c)
- 5.0 Heating of Earth's atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents. (a, b, c, e)
- 6.0 Climate is the long term average of a region's weather and depends on many factors. (a, b, c)

Structure and Composition of the Atmosphere

- 8.0 Life has changed Earth's atmosphere, and changes in the atmosphere affect conditions for life.
(a, b, c)

PHYSICS:

Motion and Forces

- 1.0 Newton's laws predict the motion of most objects. (a, b, c, d, e, f, g)

Conservation of Energy and Momentum

- 2.0 The laws of conservation of energy and momentum provide a way to predict and describe the movement of objects. (a, b, c, d)

Waves

- 4.0 Waves have characteristic properties that do not depend on the type of wave. (e)

BIOLOGY /LIFESCIENCES:

Physiology

- 9.0 As a result of the coordinated structures and functions of organ systems, the internal environment of the human body remains relatively stable (homeostatic) despite changes in the environment.
(a, b, c, d, e)

CBE
Competency-Based Education

COMPETENCY-BASED COMPONENTS
for the General Science/Integrated 4 Course

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES
<p>A. INTRODUCTION</p> <p>Understand how personal skill development-including positive attitude, honesty, self-confidence, time management, and other positive traits-contribute to academic success.</p> <p>(1 hour)</p>	<ol style="list-style-type: none"> 1. Demonstrate an understanding of classroom policies and procedures. 2. Discuss competency area and minimal competencies for the course. 3. Discuss assignment grading and scoring policy. 4. Discuss importance of the following personal skills in the classroom/lab environment: <ol style="list-style-type: none"> a. positive attitude b. self-confidence c. honesty d. self-management/work ethic e. pride in product/work f. dependability 5. Prioritize tasks and meet deadlines. 6. Describe the importance of initiative and leadership. <p>COMPETENCIES</p> <p>Resources: Allocates Time</p> <p>Interpersonal: Participates as Member of a Team</p> <p>Information: Acquires and Evaluates Information/ Organizes and Maintains Information</p> <p>FOUNDATION</p> <p>Basic Skills: Reading/ Listening/ Speaking</p> <p>Thinking Skills: Knowing How to Learn</p> <p>Personal Qualities: Self-Management</p>

**B. THE SCIENTIFIC METHOD
(INVESTIGATION AND
EXPERIMENTATION 1.0)**

Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other four strands, students should develop their own questions and perform investigations.

1. Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data. (1a)
2. Identify and communicate sources of unavoidable experimental error. (1b)
3. Identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions. (1c)
4. Formulate explanations by using logic and evidence. (1d)
5. Solve scientific problems by using quadratic equations and simple trigonometric, exponential, and logarithmic functions. (1e)
6. Distinguish between hypothesis and theory as scientific terms. (1f)
7. Recognize the usefulness and limitations of model and theories as scientific representations of reality. (1g)
8. Read and interpret topographic and geological maps. (1h)
9. Analyze the locations, sequences, or time intervals that are characteristic of natural phenomena (e.g., relative ages of rocks, locations of planets over time, and succession of species in an ecosystem) (1i)
10. Recognize the issues of statistical variability and the need for controlled tests. (1j)
11. Recognize the cumulative nature of scientific evidence. (1k)
12. Analyze situations and solve problems that require combining and applying concepts from more than one area of science. (1l)
13. Investigate a science-based societal issue by researching the literature, analyze data, and communicate the findings. Examples of issues include irradiation of food, cloning of animals by somatic cell nuclear transfer, choice of energy sources, and land and water use decisions in California. (1m)
14. Know that when an observation does not agree with an accepted scientific theory, the observation is sometimes mistaken or fraudulent (e.g., the Piltdown Man fossil or unidentified flying objects) and that the theory is sometimes wrong (e.g., the Ptolemaic model of the movement of the Sun, Moon, and planets). (1n)

(5 hours)

<p>C. PHYSIOLOGY (BIOLOGY- Physiology: 9.0)</p> <p>Understand that, as a result of the coordinated structures and functions of organ systems, the internal environment of the human body remains relatively stable (homeostatic), despite changes in the outside environment.</p> <p>(12 hours)</p>	<ol style="list-style-type: none"> 1. Explain how the complementary activity of major body systems provides cells with oxygen and nutrients, and removes toxic waste products such as carbon dioxide. (9a) 2. Explain how the nervous system mediates communication between different parts of the body and interactions with the environment. (9b) 3. Identify how feedback loops in the nervous and endocrine systems regulate conditions within the body. (9c) 4. Explain the functions of the nervous system, and the role of neurons in transmitting electrochemical impulses. (9d) 5. Explain the roles of sensory neurons, inter-neurons, and motor neurons in sensation, thought, and response. (9e)
<p>D. LINEAR MOTION AND CIRCULAR MOTION, FORCES AND GRAVITY (PHYSICS- Motion and Forces: 1.0; Conservation of Energy and Momentum: 2.0}</p> <p>Understand that Newton's laws predict the motion of most objects.</p> <p>(9 hours)</p>	<ol style="list-style-type: none"> 1. Solve problems involving constant speed and average speed. (1a) 2. Explain Newton's First Law: an object at rest remains at rest and an object in motion maintains its velocity unless the object experiences an unbalanced force. (1b) 3. Apply Newton's Second Law ($F=ma$) to solve one-dimensional motion problems involving constant forces. (1c) 4. Explain when one object exerts a force on a second object, the second object always exerts an equal magnitude and in the opposite direction. (Newton's Third Law). (1d) 5. Explain the relationship between the Universal Law of Gravitation and the effect of gravity on an object at the surface of the Earth. (1e) 6. Recognize that when a force is applied to an object perpendicular to the direction of its motion this force causes the object to change direction but not speed (for example, the Earth's gravitational force causes a satellite in a circular orbit to change direction but not speed). (1f) 7. Recognize circular motion requires the application of a constant force directed toward the center of the circle and that the direction is changed, but not the speed. (1g) 8. Know that how to calculate momentum as the product mv. (2d)

<p>E. CONSERVATION OF ENERGY AND MOMENTUM (PHYSICS -Conservation of Energy and Momentum: 2.0)</p> <p>The laws of conservation of energy and momentum provide a way to predict and describe the movement of object.</p> <p>(9 hours)</p>	<ol style="list-style-type: none"> 1. How to calculate kinetic energy by using the formula $E=(1/2)mv^2$. (2a) 2. Know how to calculate changes in gravitation potential energy near Earth by using the formula (change in potential energy) = mgh (h is the change in the elevation). (2b) 3. Know how to solve problems involving conservation of energy in simple systems, such as falling objects. (2c)
<p>F. LIGHT AND OPTICS (PHYSICS- Waves: 4.0)</p> <p>Understand the characteristic properties of light.</p> <p>(8 hours)</p>	<ol style="list-style-type: none"> 1. Know that radio, waves, light and X-rays are different wavelength bands in the spectrum of electromagnetic waves whose speed in a vacuum is approximately 3×10^8 m/s (186,000 miles/second) (4e)
<p>G. EARTH'S PLACE IN THE UNIVERSE (EARTH SCIENCES: Earth's Place in the Universe 1.0, 2.0)</p> <p>Astronomy and planetary exploration reveal the solar system's structure, scale, and change over time.</p> <p>Earth-based and space-based astronomy reveal the structure, scale and changes in stars, galaxies, and the universe over time.</p>	<ol style="list-style-type: none"> 1. Know how the differences and similarities among the sun, the terrestrial planets, and the gas planets may have been established during the formation of the solar system. (1a) 2. Recognize that the evidence from Earth and moon rock indicates that the solar system was formed from a nebular cloud of dust and gas approximately 4.6 billion years ago. (1b) 3. Know that the evidence from geological studies of Earth and other planets suggest that the early Earth was very different from Earth today. (1c) 3 Understand that evidence indicates that the planets are much closer to Earth than the stars are. (1d) 4. Know that the Sun is a typical star and is powered by nuclear reactions, primarily the fusion of hydrogen to form helium. (1e) 5. Understand the evidence for the dramatic effects that asteroid impacts have had in shaping the surface of planets and their moons and in mass extinctions of life on Earth. (1f) 6. Recognize that our solar system is located in an outer edge of the disc-shaped Milky Way Galaxy, which spans 100,000 light years. (2a) 7. Recognize that galaxies are made up of billions of stars and form most of the visible mass of the universe. (2b)

<p>(7 hours)</p>	<ol style="list-style-type: none"> 8. Recognize that stars differ in their life cycles and the characteristics of the electromagnetic radiation they emit, as revealed by telescopes that sense visual, radio, and x-ray portions of the spectrums. (2d) 9. Recognize that the evidence indicating that the color, brightness, and evolution of a star are determined by a balance between gravitational collapse and nuclear fusion. (2f)
<p>H. SOLAR RADIATION/ STRUCTURE AND COMPOSITION OF THE ATMOSPHERE (EARTH SCIENCES: Energy in the Earth System: 4.0, 5.0, 6.0; Structure and Composition of the Atmosphere: 8.0)</p> <p>Energy enters the Earth's atmosphere primarily as solar radiation and eventually escapes as heat.</p> <p>Heating of Earth's surface and atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents.</p> <p>Climate is the long-term average of a region's weather and depends on many factors.</p> <p>Life has changed Earth's atmosphere, and changes in the atmosphere affect conditions for life.</p> <p>(9 hours)</p>	<ol style="list-style-type: none"> 1. Compare the relative amount of incoming solar energy with Earth's internal energy and the energy used by society. (4a) 2. Explain the fate of incoming solar radiation in terms of reflection, absorption, and photosynthesis. (4b) 3. Identify the different atmospheric gases that absorb the Earth's thermal radiation, and explain the mechanism and significance of the greenhouse effect. (4c) 4. Know how differential heating of Earth results in circulation patterns in the atmosphere and oceans that globally distribute the heat. (5a) 5. Know that the relationship between the rotation of Earth and the circular motions of ocean currents and air in pressure centers. (5b) 6. Know that the origin and effects of temperature inversion. (5c) 7. Know that rain forests and deserts on Earth are distributed in bands at specific latitudes. (5e) 8. Know that the weather (in the short run) and climate (in the long run) involve the transfer of energy into and out of the atmosphere. (6a) 9. Know the effects on climate of latitude, elevation, topography and proximity to large bodies of water and cold or warm ocean currents. (6b) 10. Know how Earth's climate has changed over time, corresponding to changes in Earth's geography, atmospheric composition, and other factors, such as solar radiation and plate movement. (6c) 11. Explain the thermal structure and chemical composition of the atmosphere. (8a) 12. Know how the composition of Earth's atmosphere has evolved over geologic time and know the effect of outgassing, the variations of carbon dioxide concentration, and the origin of atmospheric oxygen. (8b) 13. Determine the location of the ozone layer in the upper atmosphere, its role in absorbing ultraviolet radiation and how it varies both naturally and in response to human activities. (8c)

DEFINITIONS of SCANS COMPETENCIES and FOUNDATION SKILLS

- Resources**
- Allocates Time: Selects goal-related tasks; prioritizes tasks; schedules work to meet deadlines.
 - Allocates Money: Uses or prepares budgets; forecasts costs; keeps records to track budget performance.
 - Allocates Material and Facility Resources: Acquires, stores, and distributes materials, supplies, equipment, parts, or products.
 - Allocates Human Resources: Assesses knowledge and skills and distributes work accordingly; evaluates performance; provides feedback.
- Information**
- Acquires and Evaluates Information: Identifies need for data, acquires data or creates data sources, and evaluates relevance of information.
 - Organizes and Maintains Information: Organizes, processes, and maintains written or computerized records; sorts, classifies or reformats information.
 - Interprets and Communicates Information: Selects and analyzes information; communicates the results to others using oral, written, graphic, or multi-media.
 - Uses Computers to Process Information: Uses computers to acquire, analyze, organize, and communicate information, including entering, modifying, storing, retrieving, and verifying data.
- Interpersonal**
- Participates as a Member of a Team: Works cooperatively with others; contributes ideas, suggestions and effort; encourages team members; listens and responds to contributions of others; resolves differences for the benefit of the team; takes responsibility for achieving goals and for doing own share of the work.
 - Teaches Others: Helps others learn by coaching or other means; conveys job information to others; provides constructive feedback.
 - Serves Clients/Customers: Works and communicates with clients and customers to satisfy their expectations; listens actively to determine needs; communicates in a positive manner; obtains additional resources to satisfy client or customer needs.
 - Exercises Leadership: Communicates to justify a position; encourages, persuades or motivates others; establishes credibility through competence and integrity; takes minority viewpoints into consideration.
 - Negotiates to Arrive at a Decision: Works toward agreement; clarifies problems and resolves conflicts; proposes and examines options; sets realistic goals; resolves divergent interests.
 - Works with Cultural Diversity: Works well with men and women and with a variety of ethnic and social groups; respects the rights of others; bases impressions on individual performance, not on stereotypes.
- Systems**
- Understands Systems: Knows how social, organizational, and technological systems work and operates effectively within them; knows who to ask for information and how to get resources.
 - Monitors and Corrects Performance: Monitors how procedures are working; predicts trends; diagnoses problems; takes action to maintain system performance.
 - Improves and Designs Systems: Makes suggestions for improving products or services; recommends alternatives; responsibly challenges the status quo.

DEFINITIONS of SCANS COMPETENCIES and FOUNDATION SKILLS
(continued)

- Technology
- Selects Technology: Chooses procedures, equipment, or computer programs to produce desired results.
 - Applies Technology to Task: Understands purpose and procedures for setting up and operating machines, including computers and their programs.
 - Maintains and Troubleshoots Technology: Prevents, identifies, or solves problems in machines, computers, and other technologies.

Definitions of SCANS Foundation Skills

- Basic Skills
- Reading: Locates, understands, and interprets written information in prose and documents -including manuals, graphs, and schedules -to perform tasks.
 - Writing: Communicates thoughts, ideas, information, and messages in writing; records information completely and accurately; checks, edits, and revises written material.
 - Arithmetic: Performs computations; uses numerical concepts in practical situations; uses tables, graphs, and diagrams to obtain or convey numerical information.
 - Mathematics: Approaches practical problems by choosing from a variety of mathematical techniques.
 - Listening: Receives, attends to, interprets, and responds to verbal and non-verbal messages.
 - Speaking: Organizes ideas and communicates oral messages appropriately in conversation, discussion, and group presentations; asks questions when needed.
- Thinking Skills
- Creative Thinking: Uses imagination; combines ideas or information in new ways; reshapes goals in ways that that reveal new possibilities.
 - Decision Making: Specifies goals and constraints, generates alternatives, considers risks, evaluates and chooses best alternative.
 - Problem Solving: Recognizes that a problem exists, devises and implements a plan to resolve it, evaluates and monitors progress, and revises plan as needed.
 - Seeing Things in the Mind's Eye: Organizes and processes symbols, pictures, graphs; visualizes outcomes from blueprints, diagrams, flow charts, recipes, etc.
 - Knowing How to Learn: Can use learning techniques to apply and adapt new knowledge and skills in both familiar and changing situations.
 - Reasoning: Uses underlying principles to solve problems; uses logic to draw conclusions.

SUGGESTED INSTRUCTIONAL MATERIALS and OTHER RESOURCES

TEXTBOOKS

Biggs, Alton, et al. Biology: The Dynamics of Life, New York, New York: Glencoe McGraw-Hill Publishing Company, 2000. (Student text and teacher's wrap-around edition)

Biggs, Alton, et al. Biology: The Dynamics of Life/Content Mastery, New York, New York: Glencoe McGraw-Hill Publishing Company, 2000.

Dobson, Ken, et al. Holt Science Spectrum: A Physical Approach, Austin, Texas: Holt, Rhinehart and Winston Publishing Company, 2001. (Student text and teacher's annotated edition).

Dobson, Ken, et al. Holt Science Spectrum: A Physical Approach/Basic Skills Worksheets. Austin, Texas: Holt, Rhinehart and Winston Publishing Company, 2001.

Dobson, Ken, et al. Holt Science Spectrum: A Physical Approach/Answer Keys. Austin, Texas: Holt, Rhinehart and Winston Publishing Company, 2001.

Assessments and Answer Keys- Adult Secondary Education Catalog #36-10-54.AK

MEDIA AND TECHNOLOGY

Video - Bill Nye The Science Guy: Momentum/Gravity, Elk Grove Village, Illinois: Disney Educational Productions.

RESOURCE PERSONS

Academic Supervisor

Subject area advisors

Mentor teachers

TEACHING STRATEGIES and EVALUATION

METHODS and PROCEDURES

- A. Lecture
- B. Group discussion
- C. Class readings
- D. Independent reading/research
- E. Laboratory observation/experiment
- F. Written assignments
- G. Written/oral class reports
- H. Films
- I. Field trips
- J. Individualized instruction
- K. Simulated laboratory experiments

EVALUATION

- A. Oral/written assignments
- B. Teacher observation
- C. Group/individual report
- D. Teacher/Division-made tests or quizzes developed from the competencies in this course outline

Statement for Civil Rights

All educational and vocational opportunities are offered without regard to race, color, national origin, gender, or physical disability.
