

Introductory Physical Science 101

Syllabus

- I. **Catalog Description:** PHSC 101. Introductory Physical Science I. (3-2-2). Prerequisite: Math 101 eligibility strongly recommended. An interdisciplinary approach to the laws and principles applied to matter and energy. (40.0101).
- II. **Semester:** Fall 2004
- III. **Professor:** Martha K. Newchurch
Office 122 Beauregard Hall
Phone: 985-448-4503
email: Martha.newchurch@nicholls.edu
Office Hours: 10:00-11:30 am MWF and 9:30-11:30 a.m. and 1:30-3:30 p.m. T.Th.
By appointment
- IV. **Required Texts and other materials:**
Physical Science Sixth Edition by Bill W. Tillery/McGraw Hill Publisher
A packet of course material is available at Copy Connection on Hwy 1 in Thibodaux.
- V. **Course Goals:** Students will develop an understanding of
- Scientific inquiry SI-M-A1-A8
 - Properties and changes of properties of matter.
 - Motions and forces, and
 - Transformations of energy.
- IV **Student Outcome Objectives:** Upon completion of this course, students will:
- Describe and graph the motions of objects, PS-M-B1; PS-E-B1, SI-M-A1-A8
 - Identify and describe different forces and their effects (gravity, electrical, magnetic). PS-E-B2, PS-M-B2, PS-E-C4, PS-E-C5
 - Explain when an object is not being subjected to a force, it will continue to move at a constant speed and in a straight line, PS-E-B1-B4
 - Describe how forces acting on an object will reinforce or cancel one another, depending upon their direction and magnitude,
 - Explain that unbalanced forces will cause changes in the speed or direction of an object's motion PS-M-B5, PS-H-E1, PS-H-E2
 - Compare properties of different substances that are independent of the amount of the substance, PS-M-A1
 - Infer relationships among temperature, molecular motion, phase changes and physical properties of matter, PS-E-C3
 - Describe the movement of heat and effects of heat in objects and systems, PS-M-C5
 - Identify and compare the characteristics of different types of energy, PS-M-C1
 - Explain different kinds of energy transformations and the fact that energy can be neither destroyed nor created, PS-M-C2
 - Describe the types of energy that can be involved, converted, or released in electrical circuits. PS-M0C6
 - Compare the uses of different energy resources and their effects upon the environment. PS-M-C8
 - Identify questions that can be used to design a scientific investigation. SI-E-B1-B6
 - Recognize that mathematics, technology, and scientific techniques used in an experiment can limit or enhance the accuracy of scientific knowledge, SI-M-B3
 - Design and conduct a scientific investigation, SI-H-A2
 - Use mathematics and appropriate tools and techniques to gather, analyze, and interpret data, SI-H0A3
 - Use graphs to describe and explain data and information gathered during investigations,
 - Develop models and predictions using the relationship between data and explanations,
 - Compare alternative explanations and predictions, SI-H-B3, SI-H-B4
 - Communicate scientific procedures, information, and explanations and SI-H0B3

U. Demonstrate safety procedures during scientific investigations. SI-M-A8

VII. Course Content:

- A. The World Around You (Chapter 1)
 - 1. Quantifying Properties
 - 2. Standard Units for the Metric System
 - 3. The Nature of Science
- B. Motion (Chapter 2)
 - 1. Measuring Motion
 - 2. Forces and Acceleration
 - 3. Falling Objects
- C. Newton's Laws of Motion (Chapter 3)
 - 1. Law of Inertia
 - 2. Law of Acceleration
 - 3. Law of Action/Reaction
 - 4. Momentum
 - 5. Impulse vs. changes in momentum
 - 6. Newton's Law of Gravitation
- D. Energy (Chapter 4)
 - 1. Work
 - 2. Motions, Position and Energy
 - 3. Energy Conservation
 - 4. Power
 - 5. Simple Machines and Efficiency
- E. Heat and Temperature (Chapter 5)
 - 1. The Kinetic Molecular Theory
 - 2. Temperature
 - 3. Heat
 - 4. Energy transfers
 - a. Conduction
 - b. Convection
 - c. Radiation
 - 5. First Law of Thermodynamics
 - 6. Second Law of Thermodynamics
- F. Electricity and Magnetism (Chapter 7)
 - 1. Electric charge
 - 2. Static Electricity
 - 3. Coulomb's Law
 - 4. Electric current
 - 5. Electrical Power and & Work
 - 6. Magnetism
 - 7. The Source of Magnetic fields
 - 8. Application of Electromagnets

VIII. Course Requirements:

- A. Required readings: Chapters 1-5& Chapters 7.
- B. Required written work
 - 1. Activity journal
 - 2. Inquiry Project and presentation
 - 3. Concept Map
 - 4. Historical figure report and presentation
 - 5. Field Experiences/Internet assignment.
- C. Exams:
 - 1. Test 1: Chapter 1-3
 - 2. Test 2: Chapter 4-5
 - 3. Test 3: Chapter 7

- IX Methods of evaluation:**
- A. Tests: (150 total points)
 - 1. Test 1-50 points
 - 2. Test 2-50 points
 - 3. Test 3-50 points
 - B. Journal (100 total points)
 - 1. Random entry 1:
 - 2. Random entry 2:
 - 3. Random entry 3: plus entire journal
 - C. Group concept map (30 Points)
 - D. Historical figure report and presentation (20 points)
 - E. Group enquiry activity and presentation (25 points)
 - F. Field Experiences (3 per semester) (30 points)
 - G. Grading Scale: based upon 350 points
 - 90-100% A
 - 80-89% B
 - 70-79% C
 - 60-69% D
- X. Make-Up Procedure:** Test must be made up within 2 class periods of returning to school. Evening classes must be made up the next class meeting or by prior arrangements made with the instructor. Failure to do so will result in a loss of points allotted for that test. Hands-on activities will **not** be made up: each student may drop one activity.
- XI. Academic Honest Policy:** Anyone suspected of cheating will be referred to the Dean of Arts and Sciences and university policy will be followed.
- XII. Attendance Policy:** Due to the nature of this course, many hands-on experiences will occur during most classes that cannot be made up. It is therefore very important that everyone make a commitment to attend class. **More than 2 absences will result in a lower grade in the course.**
- XIII. Final Date to Drop with a “W” is October 29, 2004. It is your responsibility to do so officially.**
- XIV. Disabilities:** Please notify the Instructor if you have a disability, so accommodations can be made. It is the general policy of Nicholls State University to assure equal opportunity for all qualified persons. Reasonable accommodations of qualified persons with disabilities will be made provided the students have self-identified with the Office of Disability Services and have provided the required documentation. Instructors will make every reasonable effort to modify the teaching methods, requirements and/or procedures of courses and examinations appropriately to accommodate the special needs of the students with disabilities, provided the academic integrity of the course or examination is not violated, and the health and welfare of all students are safeguarded.

Please do not hesitate to ask for help if you are having a problem.

Note: All parts of this syllabus are tentative and should not be construed as a contract. Students will be notified of any changes.