Northern Marianas College
CURRICULUM ACTION REQUEST

Course: NS101 Physical Science

Effective Semester / Session: Fall 2023

Type of Action:

__	New
X	Modification
__	Move to Inactive (Stop Out)
__	Cancellation

Course Alpha and Number: NS101

Course Title: Physical Science

Reason for initiating, revising, or canceling:
Additional compensation of 1 credit is being added to the course guide for the extra time and effort associated with the lab preparation

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Lorna B. Liban
Lorna B. Liban (Sep 12, 2023 11:29 GMT+10)

Lorna B. Liban — Sep. 10, 2023

Proposer — Date

Velma C. Deleon Guerrero (Sep 12, 2023 11:35 GMT+10)

Velma C. Deleon Guerrero — Sep 12, 2023

Department Chair/Director — Date

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Academic Council Vice Chair — Date

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Interim Dean of Academic Programs and Services — Date

1. **Department**
   Science, Mathematics, Health, and Athletics

2. **Purpose**
   This course will enable students to develop an understanding of the major concepts in physical science and acquire appropriate laboratory techniques and skills. NS101 helps students who intend to transfer to four year colleges and universities and need to complete educational requirement for careers as engineers, chemists, physicists, geophysicists, meteorologists, astronomers, and numerous STEM-field related occupations.

3. **Description**

   A. Required/Recommended Textbook(s) and Related Materials
   Required:

   Tillery, Bill W. 2022. *Physical Science.* 13th ed. New York, U.S.A. McGraw Hill.

   Tillery, Bill W. 2022*. Laboratory Manual to Accompany Physical Science.* 13th ed. New York, U.S.A. McGraw Hill.

   B. Contact Hours
   1. **Lecture:** 3 hours per week / 45 hours per semester
   2. **Lab:** 3 hours / 45 hours per semester"
   3. **Other:** Occasional labs maybe replaced with field trips or seminars by guest speaker

   C. Credits
   1. **Number:** 4
   2. **Type:** Regular Degree Credits

   D. Catalogue Course Description
   This is a course covering the fundamental concepts of physical science such as scientific method & measurement, motion, energy, heat & temperature, wave motions & sound, electricity, light, atomic structure, chemical bonds, chemical reactions, water & solutions, organic chemistry, nuclear reactions, the universe, the solar system, earth in space, rocks & minerals, the earth's atmosphere, weather & climate, and the earth's water. Prerequisites: EN101 and MA091 (Offered Fall and Spring)

   E. Degree or Certificate Requirements Met by Course
   This course satisfies the general education requirement for all NMC degree programs requiring physical science with a laboratory.

F. Course Activities and Design

Course activities include lectures, discussions, homework assignments, quizzes, tests, laboratory investigations, oral-reports, field trips or seminars by guest speakers, group-presentations, and lab research projects.

4. Course Prerequisite(s); Concurrent Course Enrollment

Prerequisites: EN101 and MA091
Concurrent Course Enrollment: None

Required English/Mathematics Proficiency Level(s)

English Placement Level: EN101
Mathematics Placement Level: MA091

5. Estimated Cost of Course; Instructional Resources Needed

Cost to the Student: Tuition for a 4-credit course, lab fees, cost of the textbook, lab manual, graphing calculator, and research project materials.

Cost to the College: Instructor's salary for 5 credits, encompassing 4 credits plus an additional 1 course credits to accommodate the instruction of a science lab.

Instructional resources needed for this course include chemistry classroom and laboratory space, whiteboard and markers, television and multimedia projectors, audio-visual programs/software, chemicals, laboratory apparatus, computer, internet connection, and reference materials.

6. Method of Evaluation

Student learning will be evaluated on the basis of homework assignments, quizzes, tests, laboratory reports, research projects, and oral presentations. NMC's grading and attendance policies will be followed.

7. Course Outline

This is a topical outline and does not necessarily indicate the sequence in which the material will be presented.

1.0 Physics
- 1.1 What is Science?
- 1.2 Motion
- 1.3 Energy
- 1.4 Heat and temperature
- 1.5 Wave motions and sound
- 1.6 Electricity and magnetism
- 1.7 Light

2.0 Chemistry
- 2.1 Atoms and periodic table
- 2.2 Chemical bonds
- 2.3 Chemical reactions
- 2.4 Water and solutions
- 2.5 Organic chemistry
- 2.6 Nuclear reactions

3.0 Astronomy
- 3.1 The universe
- 3.2 The solar system
- 3.3 Earth on space

4.0 Earth Science
- 4.1 Rocks and minerals
- 4.2 The atmosphere of earth
- 4.3 Weather and climate
- 4.4 Earth's waters

8. Instructional Goals

This course will introduce students to:

1.0 Scientific method and measurement;

2.0 Describing and measuring motion;

3.0 Calculating work, power, potential, and kinetic energy;

4.0 Laws of thermodynamics;

5.0 Concepts of wave motions, sound, electricity, and light;

6.0 Solve problems applying chemistry concepts;

7.0 Astronomy; and

8.0 Earth's meteorological, hydrologic, and oceanographic processes.

9. Student Learning Outcomes

Upon successful completion of this course, students will be able to:

1.0 Demonstrate safe laboratory techniques and appropriate use of common laboratory apparatus;

2.0 Apply scientific method in solving real-life problems;

3.0 Perform conversion of measurement units between measuring systems;

4.0 Explain the laws of motion, force, and momentum;

5.0 Describe energy kinds, forms, conservation, conversion, and the relationship of energy, work, and power;

6.0 Explain the laws of thermodynamics;

7.0 Evaluate the occurrence of heat transfers such as conduction, convection, and radiation;

8.0 Discuss the concept of wave motions and sound;

9.0 Explain the structure and composition of the universe, the solar system, earth in space, rocks, & minerals;

10.0 Explain the concepts of electricity and magnetism;

11.0 Describe the properties of light, reflection, refraction, diffraction, photoelectric effect, interference, and polarization;

12.0 Contrast the concept of atoms, elements, compounds, mixture, atomic number, atomic mass, mass number, atomic weight, isotopes, ions, chemical nomenclature, molecular formula, and molecular weights;

13.0 Balance and classify chemical reactions;

14.0 Solve problems involving concentration of solutions, acids & bases, organic compounds, and nuclear reactions; and

15.0 Discuss hydrologic, meteorological, and oceanographic processes.

10. Assessment Measures for Student Learning Outcomes

Assessment of student learning may include, but not be limited to, the following:

1.0 Homework/assignments;

2.0 Experiment and laboratory report sheets;

3.0 Research projects;

4.0 Class presentation; and

5.0 Quizzes, tests, and final exam.

NS101 FA23

Final Audit Report 2023-09-12

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