DEPARTMENT OF ACADEMIC UPGRADING

COURSE OUTLINE FALL 2014

SCIENCE 0100

Chemistry, Physics, Astronomy, and Geology:

INSTRUCTOR:	NANCY FRASER	**PHONE:**	539 – 2980
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OFFICE HOURS:	AS POSTED ON MY OFFICE DOOR		

Genetics and Ecology:

INSTRUCTOR:	SAMANTHA EDGAR	**PHONE:**	539 – 2889
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PREREQUISITES/COREQUISITES(s): EN 0090 and MA 0090 or consent of instructor.

REQUIRED TEXT/

RESOURCE MATERIAL:

A Little Bit of Science by N. Fraser
Lab notebook
Lab manual

CALENDAR

DESCRIPTION: This course is meant to increase the pre-high school student's understanding of connections between science, technology and society. You will be introduced to basic ideas about science, technology, biology, chemistry, physics, ecology, scientific method, along with related social issues.

CREDIT/CONTACT HOURS: SC0100 is 5 hours per week. (5-0-0)

DELIVERY MODE(s): Lecture, power point presentations, and videos will be the main method of delivery. There is also a large laboratory component in this course.

OBJECTIVES: **Course Content**

Chemistry **Time: 3 weeks**

Unit 1: Introduction to Chemistry

On completing this section, you should be able to:

i) Explain the scientific method.
v) Define density, mass, volume and know the formula that relates them. You should also know the units for each variable.
vi) Distinguish between mass and weight
vii) Classify matter as homogeneous matter, heterogeneous matter, compounds, elements, pure substances &/or solutions.
viii) Define state of matter, and state changes.
ix) Define and distinguish between physical, and chemical properties, and physical and chemical changes

UNIT 2: Atomic Structure:

On completing this section, you should be able to:

i) Define a proton, an electron and a neutron and know where the are found in an atom.
ii) State the hypotheses Dalton made about the structure of an atom. You should also be able to state the laws of definite proportions and of multiple proportions.
iii) Define atomic number, atomic mass number.
iv) Draw the atomic structure diagrams of atoms or ions for the first 20 elements.

Unit 3: Periodic Table:

On completing this section, you should be able to:

i) State the chemical symbols for the elements and know the names of the elements. You should also have MEMORIZED the first twenty elements in periodic table format.
ii) See trends in the periodic table and state the periodic law.
iii) Draw the electron dot diagrams of atoms for the first 20 elements.
iv) Define and distinguish between groups and periods.
v) Define, distinguish and state characteristics of metals, nonmetal, and metalloids and be able to find them on the periodic table.

Unit 4: Inorganic Nomenclature:

On completing this section, you should be able to:

i) Single valence metals
ii) Two nonmetals

Computer assignment: There is a website called "FREE RICE". The website sponsors send the rice you earn to needy people around the world. One of the subject that you can practice on this site is nomenclature. Choose the **BASIC CHEMISTRY** subject. While you are practising nomenclature you can earn rice for other people. You may use a periodic table. Each day when you are finished print your last page and give it to Natasha. She will keep them and when you have donated **10000** gains of rice bring them to me and I will give you 5% for the chemistry component.

Physics Time:2 weeks

Unit 1: Introduction:

On completing this section, you should be able to:

i) Define physics
ii) Become familiar with several instrument for measuring length.

Unit 2: Kinematics:(As time permits.)

On completing this section, you should be able to:

i) Solve problems related to distance, speed, and time.

Unit 3: Light: (As time permits.)

On completing this section, you should be able to:

i) Describe the nature of light.
ii) State the law of reflection, and draw and label related diagrams.
iii) Explain refraction of light, and draw and label related diagrams.
iv) Describe how holograms are made. (If time permits)

Astronomy Time: 2 weeks

Unit 1: Introduction to Astronomy

On completing this section, you should be able to:

i) Define astronomy
ii) Define universe, galaxy, star, comets, meteor, meteoroid and meteorite.

Unit 2: Our Solar System

On completing this section, you should be able to:

i) Label the layers of the sun on a diagram.
ii) State Ptolemy's model of the solar system. (Geocentric Model)
iii) State the refinements that Copernicus made to Ptolemy's model. (Heliocentric Model)
iv) State Galileo's contributions to astronomy.
v) State Kepler's three laws of planetary motion.
vi) State the refinements that Kepler made to Copernicus' model.
vii) State the order of the planets starting from the sun.

Unit 3: The Moon

On completing this section, you should be able to:

i) Name phases of the moon.
ii) Explain how tides are formed.

Unit 4: Whatever topic(s) interest students.

Expectations depend on topics selected by students.
i) Discuss fun stuff such as – blockholes, supernovae, red giants, reading star charts.

Geology Time: 2 weeks

Unit 1: Introduction to Geology

On completing this section, you should be able to:

i) Define geology.

Unit 2: Rock and minerals

On completing this section, you should be able to:

i) Define the terms rock, and minerals.
ii) Define igneous, metamorphic, and sedimentary rocks are describe how they are formed.
iii) Distinguish between magma and lava.
iv) Give an example of each type of rock.
v) Draw the rock cycle.
vi) Define weathering, and erosion.

Unit 3: Structure of the Earth

On completing this section, you should be able to:

i) Label layers of the Earth and the atmosphere.
ii) Define plate tectonics.
iii) Define earthquake and state why they occur.
iv) Discuss volcanoes and state how they are formed.

Biology Time: 4 weeks

Upon completing this section, students should be able to:

i) Describe relationships between humans and their environments, and identify related issues and scientific questions
ii) Trace and interpret the flow of energy and materials within an ecosystem
iii) Monitor a local environment, and assess the impacts of environmental factors on the growth, health and reproduction of organisms in that environment
iv) Describe the relationships among knowledge, decisions and actions in maintaining life-supporting environments
v) Investigate plant uses; and identify links among needs, technologies, products and impacts

vi) Investigate life processes and structures of plants, and interpret related characteristics and needs of plants in a local environment

vii) Analyze plant environments, and identify impacts of specific factors and controls

viii) Identify and interpret relationships among human needs, technologies, environments, and the culture and use of living things as sources of food and fiber

ix) Describe the distribution and characteristics of water in local and global environments, and identify the significance of water supply and quality to the needs of humans and other living things

x) Investigate and interpret linkages among landforms, water and climate

xi) Analyze factors affecting productivity and species distribution in marine and freshwater environments

xii) Analyze human impacts on aquatic systems; and identify the roles of science and technology in addressing related questions, problems and issues

xiii) Investigate and interpret diversity among species and within species, and describe how diversity contributes to species survival

xiv) Investigate the nature of reproductive processes and their role in transmitting species characteristics

xv) Describe, in general terms, the role of genetic materials in the continuity and variation of species characteristics; and investigate and interpret related technologies

xvi) Identify impacts of human action on species survival and variation within species, and analyze related issues for personal and public decision making

xvii) Understand alternation of generation in plants

TRANSFERABILITY: ** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability.

GRADING CRITERIA: Regular attendance is expected of all students, and is crucial to passing this course. Students who miss classes will soon find themselves falling behind and failing. Lateness will **not** be tolerated as it interrupts the instructor and fellow classmates. As per Department Policy, if you miss more than 10 per semester

of classes in any course, you may be debarred from the final exam for that course.

A certificate (a doctor's or a note from the funeral home) will be required to make up the midterm or final exam.

Call if you are going to miss a test. There may be a deduction of 10% for test rewrites.

There will be a major chapter tests test the Friday after the conclusion of each section. Student failing to write ALL of the chapter tests will receive a grade of F in the course. The major test on the last unit will be during the final exam period. This date and time will be set by the registrar's office.

***Very important:** **Laboratory attendance to each specific experiment is compulsory; a passing grade in the laboratory component is required to pass the course.** There are **NO** 'make up' labs in this course. Being absent from an experiment will result in a grade of **ZERO** for that experiment.

Marking Scheme:

Chemistry and Physics:

Assignments:	15%
Labs:	15%
Quizzes:	5%
Free Rice:	5%
Unit Tests:	60%
	100%

Biology:

Assignments:	20%
Quizzes:	15%
Labs:	15%
Unit Tests:	50%
	100%

The Final grade will be determined based on 66% of chemistry and physics grades and 34% of the Biology grade.

GRANDE PRAIRIE REGIONAL COLLEGE			
GRADING CONVERSION CHART			
Alpha Grade	4-point Equivalent	Percentage Guidelines	Designation
A+	4	90 – 100	EXCELLENT
A	4	85 – 89	
A–	3.7	80 – 84	FIRST CLASS STANDING
B+	3.3	77 – 79	
B	3	73 – 76	GOOD
B–	2.7	70 – 72	
C+	2.3	67 – 69	SATISFACTORY
C	2	63 – 66	
C–	1.7	60 – 62	
D+	1.3	55 – 59	MINIMAL PASS
D	1	50 – 54	
F	0	0 – 49	FAIL
WF	0	0	FAIL, withdrawal after the deadline

STUDENT RESPONSIBILITIES:

Students will:

- be at class regularly and on time. (If you miss more than 10 per semester of classes in any course, you may be debarred from the final exam for that course.)
- complete all pre class and pre-lab assignments before arriving in class.
- keep up with course material.
- if experiencing difficulties with course material get help immediately.
- catch up on missed material before the next class. Get a phone number from someone in the class so you can keep up.
- provide documentation for missed midterms or finals.
- be aware of penalty for failing the lab component and not writing the final.

STATEMENT ON PLAGIARISM AND CHEATING:

Refer to the College Policy on Student Misconduct: Plagiarism and Cheating at

https://www.gprc.ab.ca/files/forms_documents/Student_Misconduct.pdf

**Note: all Academic and Administrative policies are available at

https://www.gprc.ab.ca/about/administration/policies/