**SYLLABUS**

**BIO 121- GENERAL BIOLOGY SPRING 2019**
**THREE RIVERS COMMUNITY COLLEGE**
**NORWICH, CONNECTICUT 06360**

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| **Tuesday/Thursday Lecture** | **5:00 to 6:15 P.M. D 128** |
| **Tuesday Lab** | **6:30 to 9:30 P.M. A 215** |
| **Office Hours:** | **By appointment** |

TRCC INSTRUCTOR: Joseph M. Hertz, D.P.M.

jhertz@trcc.commnet.edu Text/Cell Phone: 860-983-5880

## Course Prerequisites:

Current enrollment or passing grade ("C" or better) in English 101 or an equivalent course. A semester of college chemistry with lab, or current enrollment in a college chemistry course with a lab.

## Course Description:

This course stresses the unifying themes in biology including the life processes common to all organism and their strategies for survival. Topics include scientific method, evolution, chemical basis for life, cell components and processes, cell cycles, molecular genetics and patterns of inheritance. A complete listing of concepts covered ***(A GENERAL STUDY GUIDE)*** is attached.

## Course Objectives:

Upon completion of this course, the student will be able to recognize terminology, specific biological facts, and utilize general principles associated with the structural and functional organization of living things. The student will also obtain a more fully developed series of computer-based skills. This course also stresses critical thinking skills which are designed to allow the student to: develop more meaningful learning beyond rote memorization; extend beyond lower levels of learning (knowledge and comprehension) to higher levels of learning (application, analysis, synthesis and evaluation); apply concepts and principles to real world experience and situations; and enhance problem solving skills.

## Methods of Instruction:

These will include lecture, laboratory, and may include on-line forum, computer activities, demonstration and/or multimedia presentation. Exam material will be taken from topics covered in the textbook or from the lecture. A schedule of lectures, exams, and laboratories is attached (Subject to change at the professor's discretion.)

**Text: Campbell Biology 11th edition** (The Website code is not required, but very helpful and has an E-text)

## Methods of Evaluation and Testing for Lecture and Lab

Your final course grade will be based on:
3 Exams-approximately 100 points each
Laboratory write-ups- up to 25 points each (This may change)
Weekly quizzes ~10 points each
1 final exam- 200 pts.
Homework or additional activities may be assigned
Total: ~1000 points (May vary significantly from this amount)

**A #2 pencil is required for each class as well as for quizzes and exams.** This item will not be supplied; you must bring pencils to each class and Lab. **Colored pencils will be needed in Lab.**

## Exams

Each **exam** may consist of multiple choice, true/false, short answer or essay questions. The cumulative **final** will consist of similar questions. You will have a pre-determined amount of time to complete each exam. All exams will be collected. The final exam must be taken to pass this course.

**LAB WRITE-UPS** will be due the week following completion of the lab. Pages from each lab packet will be assessed for points.

**Late activities are not accepted** (they are all due at the start of lecture on the date assigned). All but one of the assignments (your "oops it's late" assignment) must be turned in on time. If more than one assignment is late, the work will not be graded unless the instructor has been notified prior to the due date.

## Make-ups

**No make-up exams will be given without prior request to the instructor.** The final exam must be taken to pass this course.

**Lab work and lab practical exams *cannot* be made up** because there is set up of equipment which is only available week by week. **A missed unit test** can be made up on the night of the final by special arrangement with the instructor or at the testing center by a pre-arranged time. **It is the student's responsibility to contact the testing center and make arrangements** to make-up the exam. The available slots are limited as will the time allowed to make up the test. Missing more than one exam is unacceptable. Please let me know if you need to miss an exam ahead of time. Quizzes cannot be made up. If you miss a unit test, or a lab practical, you cannot pass the course.

***Special Notice:* If you have a visible or hidden disability which may require classroom, lab and/or test-taking modifications, please contact TRCC's disability service providers; Elizabeth Wilcox 860-215-9289 for learning disabilities and Matt Liscum 860-215-9265 for medical disabilities****

**NO INDIVIDUAL EXTRA CREDIT ASSIGNMENTS WILL BE GIVEN!!!**
There may be a few Extra Credit questions on exams or other opportunities available to the class throughout the semester at the instructor's discretion.

## Class Attendance Policy

Attending lecture and lab is mandatory. Leaving lecture early counts as an absence. Your presence, questions, comments are an integral part of the teaching and learning process. Any in-class work, assignments/activities are designed to further your understanding of the material and cannot be made up. Handouts from class are given once that week. In short, your participation counts and will help you to learn more and earn a better grade. College policy is that the instructor is under no obligation to "catch up" any student who habitually misses class or lab. One absence is acceptable as things happen, however, habitual absences after that will impact your learning and grade. If you must miss a class, please notify your instructor prior to the date of absence.

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## To utilize your computer account at school

**Username:** Your student ID number (no @ sign) (ex. 123456789)
**Password:** The first 3 letters of your birth month (first letter capitalized, other two lower case), the "&" sign, the last four numbers of your social security number
(ex. Mmm&1234)

**Grade Determination:**
Your final grade will be based on percentage of the following:

**(Total Points earned/Total Points possible) X 100**
There may be adjustments to this along the way.
**Grade Scale:**

**100.00 -- 93.00 = A**
**92.00 -- 90.00 = A-**
**89.99 -- 87.50 = B+**
**87.49 -- 84.50 = B**
**84.49 -- 79.50 = B-**
**79.49 -- 77.50 = C+**
**77.49 -- 73.50 = C**
**72.49 -- 69.50 = C-**
**69.49 -- 63.50 = D+**
**63.49 -- 59.50 = D**
**59.49 -- 00.00 = F**

## Revisions to the Syllabus

The instructor reserves the right to change and revise grade determination, the objectives, topical outline, assignments, or academic schedule contained in this syllabus. Any changes will be announced in advance in class.

## Cell Phones

Out of respect for your fellow classmates and instructor, **Electronic devices (cell phones, PDA's, MP3's etc.) will be put in "Silent Mode" or turned off during both lecture and laboratory. No phone answering or calling, texting or tweeting.** Please, if you need to use your phone for any reason, take it outside! **All electronic devices are disallowed during any testing session.** According to editors of The Week magazine, the typical person checks his or her smartphone 150 times throughout the day. Think about what this does to one's ability to focus attention on any task at hand! Challenge yourself to observe good habits with your phone, and to make any changes to increase the amount of time you are paying attention and focusing on anything you're doing whether in class or in other areas of your life.

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**YOUR GRADE IS YOUR RESPONSIBILITY!!!!**

Students are responsible for defining and making progress toward their educational goals. If at any time you are having difficulties with course related materials, **PLEASE** come see me or talk to your advisor. There are a multitude of learning tools available to all students—we will just have to figure out which ones will be the most helpful for you.

**Academic dishonesty and plagiarism will not be tolerated.**

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## Academic and Classroom Misconduct:

The instructor has primary responsibility for control over classroom and/or laboratory behavior and maintenance of academic integrity and can request the temporary removal or exclusion from the classroom or laboratory of any student engaged in conduct that violates the general rules and regulations of the institution or any student engaged in conduct deemed hazardous in the laboratory. Extended or permanent exclusion from lecture or laboratory activities or further disciplinary action can only be affected through appropriate procedures of the institution.

## Plagiarism, cheating on quizzes or tests, or any form of academic dishonesty is strictly prohibited.

Students guilty of academic dishonesty directly or indirectly will receive a zero for the exercise or quiz or test and may receive an "F" grade for the course in addition to other possible disciplinary sanctions which may be imposed through the regular institutional procedures.

**Important Dates** (From the Website)

***PLEASE NOTE THAT FOR ANY STATE HOLIDAY NOT LISTED IN THE BELOW SESSION INFORMATION, CLASSES ARE HELD.***

## FALL 2019 STANDARD 15 WEEK SESSION

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|---|---|
| **Aug 26** | Registration deadline and last day to drop classes for full tuition refund |
| **Aug 27** | Classes begin, add and drop periods begin |
| **Sep 2** | **Labor Day - college closed** and last day for students to add a class - online **(Aug 30 in person)** |
| **Sep 3-6** | Welcome Week |
| **Sep 9** | Last day to drop classes and partial tuition refund |
| **Sep 17** | Constitution Day observed (classes in session) |
| **Sep 20** | Professional Day (classes in session) |
| **Sep 24** | Last day to select audit option |
| **Oct 21** | Mid-term Grades Due |
| **Oct 22** | Reading Day *See Additional Notes |
| **Nov 4** | Advising day (classes in session) |
| | Registration begins for Winter '19 Intersession and registration begins for Spring '20 Semester for Continuing Degree-Seeking Students and New Students with Veteran Status |
| **Nov 5** | Advising day (classes in session) Last day to withdraw from classes, last day to select pass/fail option, and last day to submit incomplete work from Spring '19 and Summer '19 |
| **Nov 8** | Registration begins for New Student and Non-Degree-Seeking Student Registration for Winter '19 Intersession and Spring '20 Semester, and last day to apply for spring graduation (May '20) |
| **Nov 27** | College open - no classes in session |
| **Nov 28-Dec 1** | **Thanksgiving recess** |
| **Dec 15** | Last day of 15 Week Session |
| **Dec 17** | Final grades due to Registrar's office (by noon) |
| **Dec 20** | Grades available on web |
| **Dec 23** | Semesters end for CC |
| **Dec 25** | **Christmas Day - college closed** |

***Please Note -** Reading Days are to be used as study days, and/or optional make-up class time at the discretion of faculty members. No faculty member will be assigned additional duty during the scheduled reading days and no student shall be penalized for not attending any activities/classes on a reading day

## Procedure for Dropping the Course

*** College's Withdrawal Policy***

Any student who finds it necessary to discontinue this course **MUST** complete a withdrawal form in the Registrar's Office at the time of the withdrawal. If you can't withdraw in person you may call the Registrar's Office and provide them with the appropriate information.

Students may withdraw from the course anytime during the first 14 weeks of class, **without** written authorization from the instructor or their academic advisor. * **Once you withdraw from class you are no longer eligible to continue attending class or take any remaining quizzes or test.** Students who don't withdraw and stop attending will be assigned an "F" grade in this course. Verbal withdrawals **CANNOT** be accepted.

**From Rob Farinelli, Academic Dean**

"Any student who has difficulty affording groceries or accessing sufficient food to eat every day or who lacks a safe and stable place to live and believes this may affect their performance in the course, is urged to contact the student services office for support. Furthermore, please notify me (or your professor) if you are comfortable in doing so. This will enable me to provide any other resources that I (we) may possess."

**BOARD OF REGENTS FOR HIGHTER EDUCATION AND CONNECTICUT STATE COLLEGES AND UNIVERSITIES POLICY REGARDING SEXUAL MISCONDUCT REPORTING, SUPPORT SERVICES AND PROCESSES POLICY**

**Statement of Policy for Public Act No. 14-11: An Act Concerning Sexual Assault, Stalking and Intimate Partner Violence on Campus:**
"The Board of Regents for Higher Education (BOR) in conjunction with the Connecticut State Colleges and Universities (CSCU) is committed to insuring that each member of every BOR governed college and university community has the opportunity to participate fully in the process of education free from acts of sexual misconduct, intimate partner violence and stalking. It is the intent of the BOR and each of its colleges or universities to provide safety, privacy and support to victims of sexual misconduct and intimate partner violence."

**UNITED STATES DEPARTMENT OF EDUCATION AND OFFICE OF CIVIL RIGHTS TITLE IX STATEMENT OF POLICY:**
"Title IX of the Education Amendments of 1972 (Title IX) prohibits discrimination based on sex in education programs and activities in federally funded schools at all levels. If any part of a school district or college receives any Federal funds for any purpose, all of the operations of the district or college are covered by Title IX.

Title IX protects students, employees, applicants for admission and employment, and other persons from all forms of sex discrimination, including discrimination based on gender identity or failure to conform to stereotypical notions of masculinity or femininity. All students (as well as other persons) at recipient institutions are protected by Title IX – regardless of their sex, sexual orientation, gender identity, part-or full-time status, disability, race, or national origin-in all aspects of a recipient's educational programs and activities."

If any student experiences sexual misconduct or harassment, and/or racial or ethnic discrimination on Three Rivers Community College Campus, or fears for their safety from a threat while on campus, please contact Edward A. Derr, the Diversity Officer and Title IX Coordinator:

Edward A. Derr
Title IX Coordinator and Diversity Officer
Admissions Welcome Center * Office A116
574 New London Turnpike, Norwich CT 06360
860.215.9255 * EDerr@trcc.commnet.edu

*Course Objectives:*

1. Distinguish between living organisms and non-living things by describing the features and characteristics of life.

2. Using the procedure and terminology, describe the scientific method through examples.

3. Identify the principal elements that make up the body, give their chemical symbols and summarize the main functions of each.

4. Demonstrate knowledge of the atomic structure and its relationship to the interaction of atoms to form molecules.

5. Demonstrate knowledge of ionic, covalent and hydrogen bonds and give examples of each, compare them in terms of the mechanisms by which they are formed and their relative bond strengths.

6. Define pH in terms of hydrogen ion concentration and be able to identify any given pH as acid, base, or neutral and discuss their properties. Describe how pH changes are minimized by buffers.

7. Describe the types and functions of organic and inorganic compounds found in the body.

8. Demonstrate knowledge of the cell organelles and their functions.

9. Demonstrate knowledge of the various mechanisms of active and passive transport relative to the plasma membrane.

10. Discuss the effect of the first and, second taws of thermodynamics and relate how they affect organisms and the ecosphere.

11. Explain the composition, classification, and function of enzymes. Explain and describe factors influencing an enzymes regulation.

12. Define and explain anabolic and catabolic mechanisms. Explain how anabolic and catabolic reactions are essential to a cell.

13. Explain how chemical energy (ATP) is released by respiratory processes (anaerobic and aerobic).

14. Explain the process of photosynthesis

15. Demonstrate knowledge, and comprehension of mitosis and meiosis

16. Explain the role of genes in inheritance and how they are passed from one generation to the next.

17. Demonstrate a knowledge of the Mendelian Laws of Genetics and solve genetic problems involving monohybrid and dihybrid crosses.

18. Demonstrate a knowledge of the various forms of gene interaction.

19. Demonstrate basic knowledge of genetic engineering.

20. Discuss some common forms of human genetic disease.

21. Explain the role of DNA and RNA in inheritance, protein productivity and life processes.

## *Topic Outline.*

I. Life and science
- a. Life
- b. Characteristics of life
- c. The scientific method
- d. Development of the scientific attitude
- e. Biology today
- f. Biology as a science

II. Chemistry
- a. Matter and elements
- b. How elements differ
- c. Structure of matter
- d. Election arrangement
- e. Electron arrangement vs. Reactivity
- f. Chemical bonding
    1. Ionic bonding
    2. Covalent bonding
        a) polar
        b) non-polar
    3. Hydrogen bonding
    4. Van der Waals Forces
- g. Inorganic compounds
    1. Acids
    2. Bases
    3. Salts
    4. Water

II. Chemistry (continued)
    h. Organic compounds
        1. Carbohydrates
        2. Lipids
        3. Proteins
        4. Nucleic acids

III. Cells
    a. The cell theory
    b. The cell and its parts (structure and function)
        1. Membrane
        2. Endoplasmic reticulum
        3. Ribosomes
        4. Golgi complex
        5. Mitochondria
        6. Vacuoles
        7. Plastids
        8. Centrioles
        9. Cilia and flagella
        10. Nucleus
    c. Prokaryotic and eukaryotic cells
    d. Compare and contrast between plant an animal cells

IV. The cell membrane/wall
    a. The cell membrane/wall structure and function
    b. The transport of materials across the membrane
        1. Passive transport
            a) osmosis
            b) diffusion
            c) dialysis
        2. Active transport
        3. Endocytosis
            a) pinocytosis
            b) phagocytosis
            c) receptor mediated endocytosis
        4. Exocytosis
        5. Co-transport

**V.** Energy transformations

a. Chemical directions

1. The first law of thermodynamics
2. The second law of thermodynamics
3. Entropy and enthalpy

b. Cells energy

1. ATP

c. Metabolism

1. Anabolic reactions
2. Catabolic reactions

d. Enzymes

1. Characteristics
2. Chemical and physical properties
3. Classification
4. Action
5. Inhibition

e. Cell Communication: reception, transduction, response)

f. Cellular respiration

1. Glycolysis (aerobic and aerobic respiration)
1. Transfer reaction
2. Kreb's cycle (Citric acid cycle)
4. Electron transport chain and chemiosmosis
5. Fermentation

g. Photosynthesis

1. Requirements
2. Light reaction (photophosphorylation)
3. Dark reaction (carbon fixation)

VI. The cell cycle

a. Control of cycle

1. Cancer

b. Interphase

1. (GI) Gap I phase
2. (S) Synthesis phase
3. (GII) Gap II phase

c. Mitosis

1. Prophase
2. Metaphase
3. Anaphase
4. Telophase

d. Meiosis

1. Gametogenesis
   a) spermatogenesis
   b) oogenesis

VII. Genetics

a. Genes
    1. Composition
    2. Function

b. Chromosomes
    1. Structure
    2. Role
    3. Number

**c.** Mendelian inheritance
    1. Dominance
    2. Independent assortment
    3. Segregation

d. Monohybrid and dihybrid crosses
    1. Homozygous organism
    2. Heterozygous organism
    3. Genotype
    4. Phenotype
    5. Alleles
    6. Dominance
    7. Recessive

e. Laws of Probability
    1. The sum law
    2. The product law
    3. Application

f. Gene interaction
    1. Incomplete dominance
    2. Epistasis
    3. Codominance

g. Quantitative genetics
    1. Polygenic inheritance
    2. Multiple alleles
    3. Pleiotropy

h. Sex-linked traits
    1. The sex determining chromosome
    2. X-linked (and influenced) genes
        a) color blindness
        b) hemophilia
    3. Y-linked genes

VIII. Human genetics
- a. Chromosomal abnormalities
  1. Irregular numbers (aneuploid) (ploid vs somic)
  2. Monosomic cells
  3. Trisomic cells
- b. Genes and disease
  1. Sickle cell
  2. Cystic fibrosis
  3. Neurofibromatosis
  4. Huntington disease
  5. Tay-Sachs disease
  6. PKU
  7. Trisomy 21 (Down's syndrome)
  8. Turners syndrome
  9. Klinefelter syndrome
  10. Super male
  11. Meta female
- c. Chromosomal aberrations
  1. Mutation
  2. Deficiency
  3. Duplication
  4. Inversion
  5. Translocation

IX. DNA and the genetic cod
- a. Protein synthesis
  1. DNA
  2. Transcription
  3. Translation

X. Gene regulation (operon theory)
- a. Operator gene
- b. Promoter region
- c. Regulator gene
- d. Structural gene

XI. Genetic engineering
- a. Enzymes involved
- b. Common Techniques