SOUTHEAST COMMUNITY COLLEGE
DIVISION OF ARTS AND SCIENCES
Sciences
Revision Date: 07-01-19

I. CATALOG DESCRIPTION

Course Number:	BIOS2410
Course Title	General Genetics
Prerequisite(s):	1000 level bioscience course and one year of high school algebra or instructor permission.
Catalog Description:	An overview of the principles of plant and animal genetics including Mendelian heredity, modern concepts of heredity, genetic mechanisms of evolution and molecular genetics. Discusses fundamental information concerning prokaryotic and eukaryotic gene structure, gene expression, gene organization, gene regulation, gene transfer, cancer, recombinant DNA technology, human heritable diseases and population genetics. Lab is required concurrently.
Credit Hours:	4.0
Class Hours:	45
Lab Hours:	30
Total Contact Hours:	75

II. COURSE OBJECTIVES: *Course will*:

A. Lead to a greater understanding by the students of the causes and consequences of genetic variation and heredity.
B. Allow students to be able to identify and connect genetic changes at the whole organism level, the molecular level and the population level.
C. Increase knowledge of the terminology used by geneticists and biologists.
D. Improve the student's ability to understand and use biotechnology methods and databases.
E. Increase the problem-solving skills of students, especially in those areas related to genetics.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

A. Student Learning Outcomes: *Student will be able to*:

1. Understand and utilize genetic terminology.
2. Identify and understand mitosis and meiosis.
3. Identify and understand the basic concepts of heredity and Mendelian Genetics.
4. Connect Mendelian Genetics to mitosis and meiosis.
5. Identify and understand variations of Mendelian Genetics such as epistasis and sex-linked traits.
6. Identify and understand linkage, genetic and physical mapping and recombination.
7. Identify examples and the causes of new genetic variants.
8. Understand basic components of the structure of DNA.
9. Identify and understand the basic components of replication, transcription and translation.
10. Identify and understand basic concepts regarding control of genes.
11. Identify some of the current technologies used in genetics, especially in genomics.
12. Identify some of the effects of genetic variation on populations.
13. Identify some of the connections between genetics and evolution, medicine and agriculture.
14. Show evidence of improvement in analytical skills, especially regarding genetics.
15. Give oral presentations on an important area of genetics.

B. General Education Learning Outcomes

1. GELO 3: Critical Thinking & Problem Solving.

a. Collect, identify, interpret and analyze data.
b. Evaluate the validity of arguments, alternatives, data, outcomes, and/or impacts of actions.

2. GELO 5: Analytical, Quantitative, and Scientific Reasoning.

a. Understand and create logical arguments supported by quantitative and scientific evidence and communicate those arguments in a variety of formats.
b. Manipulate formulas, data sets, graphs, tables, etc. in a way to produce a meaningful outcome.

IV. CONTENT/TOPICAL OUTLINE (course outline may provide more detailed information)

A. The study of cell reproduction, mitosis and meiosis.
B. The study of the basic principles of heredity.
C. The study of the extensions and modifications of the basic principles of heredity.
D. The study of bacterial and viral genetic systems.
E. The study of chromosome variation.
F. The study of the structure and replication of DNA.
G. The study of transcription and translation.
H. The study of gene regulation.
I. The study of gene mutation, transposable elements and DNA repair.
J. The study of molecular genetic analysis, biotechnology and genomics.
K. The study of quantitative genetics.
L. The study of the population genetics.

V. INSTRUCTIONAL MATERIALS

A. Required Text(s):

1. Pierce, Benjamin A. *Genetic Essentials*, 3rd Edition, W.H. Freeman and Company, 2018, ISBN-13: 978-1-4292-9516-1.

B. Other Resources**:**

1. Lab activity handouts

VI. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:

1. Lecture
2. Lab
3. Demonstration
4. Computer-based database analysis

VII. METHODS OF EVALUATION

A. Methods of evaluation typically include a combination of the following:

1. Exams
2. Quizzes from lecture and lab
3. Homework from lecture and lab
4. In-class assignments
5. Oral presentation (lab)

B. SCC GRADING SCALE

A+	95-100	C+	75-79	F	59 or less
A	90-94	C	70-74		
B+	85-89	D+	65-69		
B	80-84	D	60-64		

VIII. SPECIFIC COURSE REQUIREMENTS

A. None**.**