

Genetics & You (PLSC 111)

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Office Hours: By appointment (send email)

Class Hours: 9:30-10:20 TR
Credits: 2

Course Description

In this course we will provide/discuss the basic principles of genetics and relate them to everyday occurrences/issues. Class will be divided into five groups of six students to discuss issues/topics regularly during the semester. Students are expected to understand and discuss current ethical/moral issues relating to genetics.

Objectives

- 1. Have a broad background in understanding genetics**
- 2. Have a base for continued study in genetics**
- 3. Better understand the genetic principles as it relates to societal issues**

Educational Philosophy

The **background** of the students in the course is **very diverse**. Therefore, I will give many examples in human genetics with the thought this would be of interest to all. However, we also will try to have examples in plants and animals so that, hopefully, I sometime will discuss an organism that is of special interest to you. Specifically, try to extrapolate the principle to the organism of your interest. The lecture outline is the "**syllabus**" and **handouts**. I will be taking questions for the tests from information in the outline and/or given in lecture. I realize that many people are in lecture, but I encourage you to **stop me to ask questions or if you wish a concept to be repeated**. **My purpose for being in the class is to help you in understanding genetics.**

Assessments

1. A mid-term exam worth 100 points (Thursday March 9, 2005)
2. A final exam worth 100 points (Wednesday May 10, 2005 at 8:00 am – 10:00 am)
3. In class discussions of ethical issues as they related to genetics 100 points
4. Extra credits (in class quiz)

Grades

The grading is by letter grades determined by total points of the exams and discussion points

A	270 to 300
B	240 to 269
C	210 to 239
D	180 to 209
F	less than 180

Cancellations

I will consider that a university cancellation of a class meeting time automatically delays all the scheduled activities (lectures AND tests) to the NEXT regularly scheduled meeting time.

Special Needs

A student with special needs for lecture and/or testing should obtain documentation from student Health or an appropriate office so that I can assist in meeting those needs.

Dishonesty

The College of Agriculture has an Honor System which believes that a student has the privilege and responsibility to perform honestly and responsibly. An indication of dishonesty will be referred to the Honor's Commission made up of students. I, also, retain the privilege of deducting points from a test if I deem the action is warranted. Appropriate methods are available for appeal.

Schedule

- I. Introduction
- II. Introduction to genetics and scientific inquiry
- III. Genes
- IV. Mendelian genetics
- V. Chromosome theory of inheritance
- VI. Extensions of Mendelian analysis
- VII. Linkage
- VIII. DNA and genes
- IX. Central dogma
- X. DNA testing
- XI. Genetics Testing
- XII. Manipulation of natural genetic variation
- XIII. Exam I

Schedule

- XIV. Moral philosophy/Discussion principles
- XV. Harvest of Fear
- XVI. Embryo testing, genetic counseling and abortion
- XVII. Genetic Testing for disease
- XVIII. Cloning
- XIX. The GMO issue
- XX. Patenting life
- XXI. Gene Hunters
- XXII. Final Exam

— Blue indicates discussion topics

— Green indicates video and discussion

Introduction

- Living systems are highly ordered islands in a universe that naturally tends toward disorder and disarray
- The key to life is found in the chemical behavior of biological structures called **genes**
- **Genes are the fundamental units that control heredity**
- Genetics is the branch of science that is devoted to the study of the genes
- Because the genes play such a central role in the process of life, genetics has become a keystone that supports and ties together many areas of biology

Introduction

Under the appropriate conditions, genes are able to generate faithful copies of themselves

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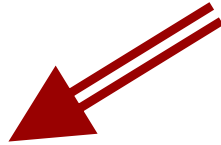
Replication

Introduction

Under the appropriate conditions, genes are able to generate faithful copies of themselves



Replication



Each living system possesses instructions, handed down from its remote ancestors

Introduction

Two major findings of genetics have been monumentally significant in the unification of biology into a coherent science



1. The staggering variety of life forms on earth (plants, fungi, insects, and) **share a common ancestor** that changed and evolved
2. Genetics has shown that **all life forms are based on a common system** for storing, duplicating, copying, and translating information

Introduction

Examples:

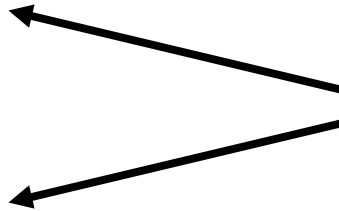
Agriculture

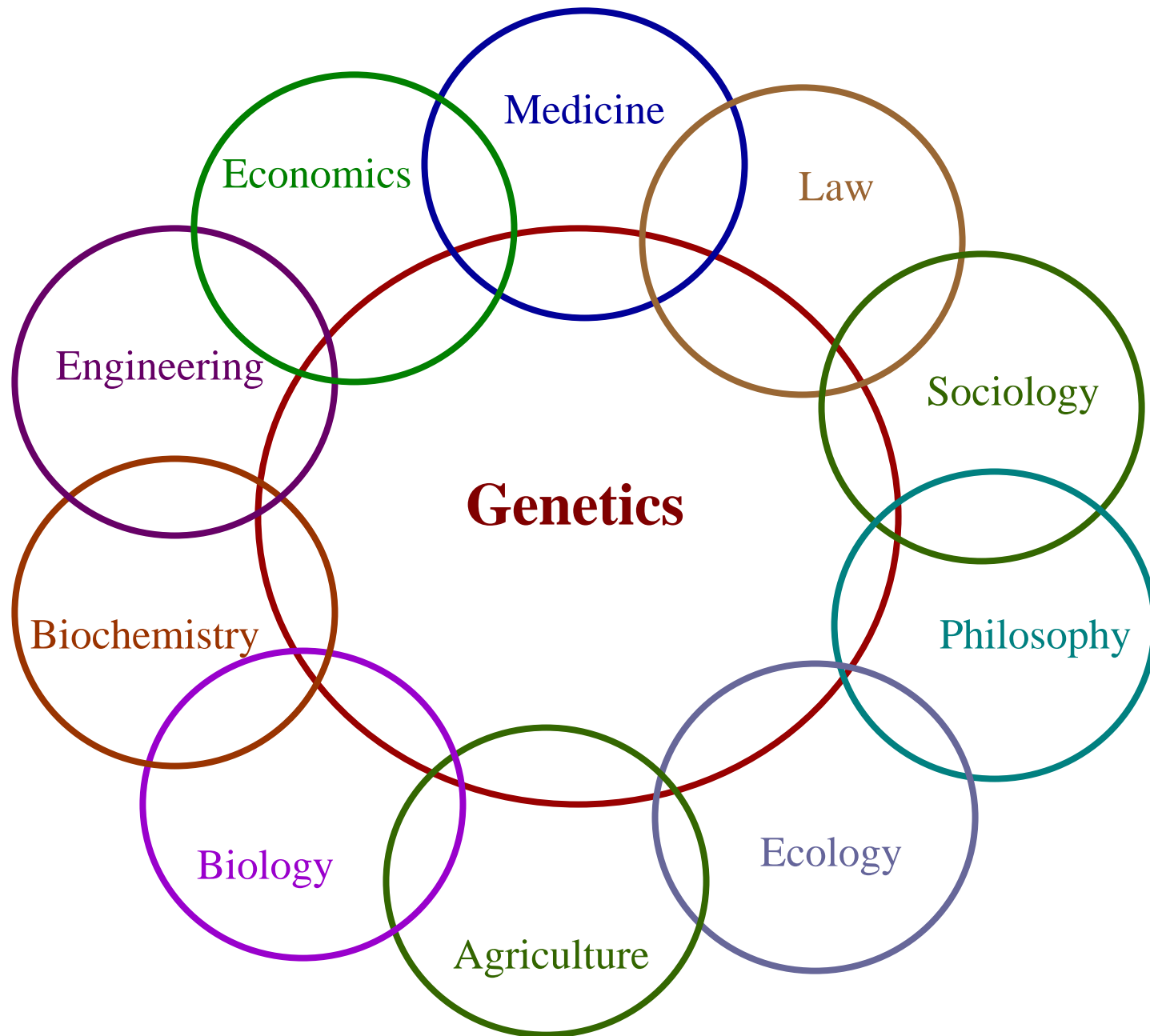
Animal husbandry

Selection

Yield

greater vigor,
nutritional quality





The findings of genetics have powerful impacts on many interacting areas of human endeavor