

NOUVEL CATHOLIC CENTRAL HIGH SCHOOL

HUMAN GENETICS

COURSE SYLLABUS

COURSE DESCRIPTION:	<p>This one-semester course for 10TH, 11th and 12th grade students is designed to introduce the history, science, and practical side of human genetics. Tenth grade students may enroll as long as they are concurrently enrolled in Chemistry. Students will be exposed to many different aspects of the field and will gain experience in many of its main tools—DNA structure, protein synthesis, patterns of inheritance, pedigree analysis, human genetic disorders, population genetics, and genetic technologies such as RFLP analysis, GMOs, DNA fingerprinting, gel electrophoresis, etc.</p> <p><i>Prerequisite: Successful completion of Biology and prior or concurrent enrollment in Chemistry.</i></p>
MAJOR COURSE GOALS:	<p>At the end of the semester, students will:</p> <ol style="list-style-type: none">1. Know the structure of DNA and RNA and be able to distinguish between them.2. Explain how DNA is transcribed and translated into proteins.3. Predict ratios of genotypes and phenotypes of offspring using Mendelian genetics and Punnett squares.4. Calculate the frequency of alleles in a population.5. Explain the causes, symptoms, treatments, and inheritance of common genetic disorders.6. Perform gel electrophoresis.7. Understand the basis of genetic technologies such as DNA fingerprinting, RFLP analysis, GMOs, and cloning, as well as the ethical concerns associated with them. How these technologies are viewed in the context of the teachings of the Catholic Church will also be addressed.
COURSE ASSESSMENT PLAN:	<p>◆ Daily work will include lecture, projects, homework, reading and writing assignments, and flipped lessons. Emphasis is placed on problem-solving and application of information.</p>

	<ul style="list-style-type: none"> ◆ Participation—Students are expected to be active participants in this course, asking and answering questions and engaging in the class discussions daily. ◆ Quizzes and tests—There will be a formal assessment at the end of each topic. Format of the assessments will vary depending on the topic, but may include multiple choice, short answer, problem solving, fill in the blank, and data analysis. ◆ Final Exam—The final exam will consist of two parts. Part one will be a typical pencil-and-paper, information-based test. The second part will be a project detailing a topic of particular interest to the student. Topics will vary and be determined as a result of conferences between student and teacher. ◆ Seniors will be excused from the paper-and-pencil part of the exam under the following conditions— <ul style="list-style-type: none"> *Must have a 90% or better for the first quarter of class and a 90% or better for the second quarter. A 90% average does not qualify. *Must have zero unexcused absences. *Must have fewer than 3 tardies in each quarter. *<i>The instructor reserves the right to consider special circumstances when making decision regarding exempting seniors from exams.</i> ◆ Grades will be determined based on total cumulative points. Final grades will be figured based on the following percentages (exact percentages may vary slightly): <ul style="list-style-type: none"> *40% Daily class work, mostly lab-based activities *45% Tests and quizzes *15% Projects ◆ Final semester grades are determined according to the policy set forth in the Student Handbook.
<p>SUPPLIES AND MATERIALS NEEDED:</p>	<ul style="list-style-type: none"> ◆ General—One-subject spiral notebook, pen (blue or black) and pencil, calculator, colored pencils. ◆ Project supplies—At different times throughout the semester, students may be required to provide supplies for various projects. Necessary supplies will vary depending on the project. If the cost of these supplies is beyond the means of a student, arrangements will be made to procure the supplies.
<p>EXTRA HELP:</p>	<p>Extra help is available before school (most days) and after school by appointment. Many questions can also be answered via email. If the student needs help with anything, do not wait until the last minute to seek it out!</p>
<p>INSTRUCTIONAL</p>	<p>Every student learns in a different way, and every effort is made to ensure that every student has an opportunity to operate within their comfort zone while still</p>

PHILOSOPHY:	stretching and pushing the student to do something new and different. Flexibility is a critical skill for the student to learn. The goal for this course is to give each student a working understanding of how traits are determined, passed on, and modified through manipulation of DNA.
MAJOR COURSE PROJECTS AND INSTRUCTIONAL ACTIVITIES:	<ul style="list-style-type: none"> ◆ Translation video project—Students will produce a video (live action, stop motion, or paper slide) showing the steps of translation. (<i>Major course goals #1, 2</i>) ◆ Mendelian genetics packet—Students will solve problems and perform calculations based on information provided. (<i>Major course goal #3, 4</i>) ◆ DNA Fingerprinting—Students will use gel electrophoresis equipment to test RFLP samples. (<i>Major course goals #6, 7</i>) ◆ Genetic disorder project—Students will learn about the origin, inheritance, symptoms, and treatment of a disorder and present their results to the class in a manner of the student’s choosing (<i>Major course goals #5</i>) ◆ Final project—Students will become an expert in a genetic technology topic and will write a paper outlining its origin, its current usage in modern society, and any ethical concerns (particularly in the context of the teaching of the Catholic Church).
CLASSROOM EXPECTATIONS:	<p>Everything that is expected of the student can be summed up in three simple statements:</p> <ol style="list-style-type: none"> 1. Be respectful of yourself and others. 2. Be respectful of any and all materials found in the classroom and in the possession of yourself or others. 3. Do as the teacher requests to the best of your ability. <p>Failure to abide by these guidelines will result in verbal reprimand, detention, or removal from class, depending on the severity and/or repetitive nature of the offense.</p> <p>***Please note school policy regarding excessive absences (found in the Parent-Student Handbook)—A student who exceeds 10 absences in a semester will lose credit for that class. This policy will be enforced.</p>
HOMEWORK POLICY AND GRADING SCALE:	<ul style="list-style-type: none"> ◆ Late work—Homework is expected to be turned in on time and be of high quality. Late work will be accepted only at the discretion of the instructor. ◆ Letter grades will be determined according to the scale published in the Student Handbook.

	<p>◆ Extra credit—The student will have an opportunity to earn a few extra points each quarter. The student is to find science news articles from a newspaper or a source such as www.sciencedaily.com and write a short summary of the article. The article and the summary must be turned in together for a maximum score of two points per article. The student may do more than one article per quarter as the total number of points allowed will vary by quarter. No magazine articles will be accepted.</p>
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	<i>Please note: E-mail is the most efficient mode of communication.</i>