



**Course Meeting Time and Location: Wednesday evenings, 6-9 pm; Crawford 305**

**Prerequisites:** Honors Director's Permission

**Instructor:** Prof. R. Marshall Werner  
Crawford 327  
635-2281  
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**Office Hours:**

Monday	Tuesday	Wednesday	Thursday	Friday
9AM-12PM	8-10AM	Appt.	Appt.	Appt.

**Required Texts & Materials:**

- Bound composition notebook

**Provided Texts & Materials:**

- DNA: The Secret of Life, 2003, James D. Watson, Alfred A. Knopf, New York, ISBN: 0965739694

**Course Description:**

**DNA: The Secret of Life HONR 302 (3,0)**

While the importance of DNA for the existence of life on Earth is without question, there are numerous moral, political, legal, and ethical questions that arise with our increasing understanding and manipulation of the genetic material. This course will provide students with a basic understanding of the structure and function of DNA, but more importantly, it will allow students to critically evaluate issues surrounding the “Pandora’s Box” that the study of DNA represents. Topics investigated will include early genetics and the discovery of the structure of DNA, genetic manipulation in biotechnology and agriculture, what genomes tell us about evolution, DNA criminal evidence, and the genetic basis and treatments of many diseases.

**Course Overview:** This course will be designed to give enough technical background that students from all disciplines will appreciate and understand how DNA works. A detailed knowledge of biochemistry will not be required. In addition, both science and non-science majors will benefit from detailed discussions regarding the ethical, legal, and moral aspects surrounding this topic. Unfortunately, most science classes do not address these issues. For example, the recent Supreme Court decision that prevents the patenting of human genes such as BRCA1 and BRCA2, genes involved in the development of breast and ovarian cancer, provides a springboard to discuss the numerous issues surrounding genetic research and testing.

General Topics will include: Beginnings of Genetics, Eugenics and Genetic Discrimination, History of The Double Helix, Deciphering the Genetic Code, Genetic Engineering, Biotechnology and DNA, Genetically Modified Agriculture, The Human Genome Project, The Genetic basis of Evolution, DNA and our Human Past, Law and DNA, DNA and Genetic Disease, Modifying our Genetic Code, DNA and the Mind.

**HONR 302, DNA: The Secret of Life, Objectives:**

Upon completion of this class students will be able to:

- Demonstrate multi-faceted knowledge of the legal, moral, ethical, and political issues surrounding the study and manipulation of DNA.
- Use critical thinking skills to evaluate what the study of DNA has informed us about evolution, disease, and our both our human history and future.

- Understand that the study of DNA can be used for good or ill purposes and identify the risks that are posed if genetic information is misused or misunderstood.
- Develop lucid opinions regarding genetic issues through writing persuasive essays.

**Grading Information and Policies:**

Class Participation/Attendance	30%
Short Persuasive Essays (composition book)	30%
Topic Debate	10%
Creative Project	10%
Book Review	10%
Final (Major topic Essays)	10%

**Grading Scale:**

98-100	A+	70-77	C
92-97	A	68-69	C-
90-91	A-	66-67	D+
88-89	B+	62-65	D
82-87	B	60-61	D-
80-81	B-	0-59	F
78-79	C+		

**Course Policies / Information:**

1. **Attendance:** Class attendance is mandatory and will be recorded for this course. Students may have no more than 3 unexcused absences for the semester. Students with more than 3 unexcused absences for the semester may be advised to withdraw or may receive a failing grade for the course at the teacher’s discretion. LSSU sanctioned travel related absences (athletics, conference presentations, conference attendance) are approved by the Provost and the instructor shall accommodate students in these situations. However, students are expected to make arrangements with the instructor before the travel occurs. Failure to do so may result in “F” grades being assigned for the missed work.
2. **Reading Assignments:** Please perform reading assignments BEFORE attending class on Wednesday evenings. These assignments are listed in the syllabus on the last page. The first week of class, there is no reading assignment since you will receive your books in the first lecture. However, you should read Chapter 1 from J.D. Watson’s book “DNA: The Secret of Life”, before coming to the second class. This will prepare you for the second week’s lecture that will focus on Chapter 1 material. For subsequent weeks, we will be covering the general material in each chapter assigned. We will all get much more out of this class if you do your readings before class.
3. **Writing Assignments:** We will be using a bound composition notebook to write out short essays, definitions, and sketches. You will write these by hand putting your best effort forward. We will discuss the format of writings in the first lecture. In general, we will explore topics using a persuasive essay format where you will investigate a topic and form an opinion regarding that topic. Obviously, there will be no “wrong” answers; however, your writing style and the logic of your arguments should be strong. I will collect and grade these composition books before spring break and before finals week.

4. **Book review:** You will select a book from a list of provided references related to DNA to read, summarize, and review. We will submit this review to the Amazon.com website as part of the assignment. More details to follow.
5. **Creative Project:** You will identify some topic of interest that relates to DNA and create a tangible object, item, program, video, image, painting, sculpture, dance, etc. that can be displayed for the entire class to view or experience. More details to follow.
6. **Class Debates:** You will randomly be given a topic related to a moral or ethical dilemma related to DNA, and participate in a debate with your peers. More details to follow.
7. **Missed Work:** Completing assignments on time, and keeping up with the class material is important for success in this course and in college. Generally, late or missed assignments will not be accepted except for legitimate (pre-approved when possible) reasons as determined by the instructor, or will be accepted for partial credit only at the teacher's discretion. Examples of legitimate reasons are: severe illness or death in family.
8. **Academic Dishonesty:** Students are expected to perform all assigned work themselves unless otherwise noted. Any form of cheating or plagiarism will be handled in accordance with the Honor Code Procedures. Violations of the Honor Code may result in an F for the course grade. Students who violate this Honor Code will be reported to the Academic Affairs Committee, with a possible result of expulsion from LSSU.
9. **Electronic Devices:** Use of devices will not be permitted unless specifically related to classroom activities. Texting and instant messaging in class will not be permitted. Generally, students will not be allowed to use cell phones in class, except for emergencies.

### University Policies and Statements:

#### **The Americans with Disabilities Act & Accommodations**

In compliance with Lake Superior State University policies and equal access laws, disability-related accommodations or services are available to students with documented disabilities.

If you are a student with a disability and you think you may require accommodations you must register with Disability Services (DS), which is located in the KJS Library, Room 103, (906) 635-2355 or x2355 on campus. DS will provide you with a letter of confirmation of your verified disability and authorize recommended accommodations. This authorization must be presented to your instructor before any accommodations can be made.

Students who desire such services should meet with instructors in a timely manner, preferably during the first week of class, to discuss individual disability related needs. Any student who feels that an accommodation is needed – based on the impact of a disability – should meet with instructors privately to discuss specific needs.

#### **IPASS (Individual Plan for Academic Student Success)**

If at mid-term your grades reflect that you are at risk for failing some or all of your classes, you will be contacted by a representative of IPASS. The IPASS program is designed to help you gain control over your learning through pro-active communication and goal-setting, the development of intentional learning skills and study habits, and personal accountability. You may contact 635-2887 or email [ipass@lssu.edu](mailto:ipass@lssu.edu) if you would like to sign up early in the semester or if you have any questions or concerns.

## Tentative Course Outline (subject to adjustment)

Week	Date	Topic	Reading	Assignments for Week
1	W 1/15	<b>Course Introduction</b> <b>Persuasive Writing</b> Movie: GATTACA	Article on genetic manipulation	<b>Comp. Book:</b> GATTACA questions. <b>Essay:</b> Should we be able to choose traits of offspring?
2	W 1/22	Beginnings of Genetics: from Mendel to Hitler	Watson: Ch. 1	<b>Comp. Book:</b> define "Eugenics" <b>Essay:</b> Do you feel that Eugenics has any real basis, and describe one major social impact of eugenic thinking.
3	W 1/29	The Double Helix: This is Life Build Double Helix Model	Watson: Ch. 2	<b>Comp. Book:</b> define "Life" and vitalism <b>Essay:</b> Do you agree with the statement, "the discovery of DNA was the death knell for vitalism"?
4	W 2/5	Reading the Code: Bringing DNA to Life <b>Choose Book to Review</b>	Watson: Ch. 3	<b>Choose Book to Review – List distributed in class</b> <b>Comp. Book:</b> define "Central Dogma of Biology" <b>Essay:</b> Discuss your opinion about the origin of life on earth and do you agree that the presence of RNA must have allowed life to form on our planet?
5	W 2/12	Playing God: Synthetic Life?	Watson: Ch. 4	<b>Comp. Book:</b> What was the "Asilomar Conference"? <b>Essay:</b> Was public backlash to Boyer and Cohen's DNA cloning technique justified?
6	W 2/19	Biotechnology and Agriculture: Pandora's Cereal Box	Watson: Ch. 5+ 6	<b>Comp. Book:</b> Summarize the biotech companies Genentech and Monsanto. <b>Essay:</b> Do you agree with Watson's distinction on patent's of methods vs. products? (pg. 124) <b>Essay:</b> Do you think there is a difference between selective breeding and growing GMOs?
7	W 2/26	The Human Genome: Blueprint for a Human <b>Turn in Composition Books</b> <b>Submit Creative Project idea</b>	Watson: Ch. 7	<b>Turn in Composition Books</b> <b>Submit Creative Project idea</b>
8	W 3/5	<b>Spring Break</b>	<b>Cont. Reading Book for Review</b>	<b>Outline:</b> The major players in the "Human Genome Project" <b>Essay:</b> Do you agree with Watson's assessment that gene sequences should not be patented?
9	W 3/12	Comparing Genomes: The Genetic basis of Evolution	Watson: Ch. 8	<b>Comp. Book:</b> define "genome", "proteome", "transcriptome" <b>Essay:</b> IF possible, would it be ethical to create a new form of life never before seen on our planet? (pg. 210) <b>Essay:</b> Does analysis of different genomes say anything about the relationships of species or about Darwinian evolution?
10	W 3/19	Out of Africa: DNA and our Human Past	Watson: Ch. 9	<b>Comp. Book:</b> define mtDNA, sketch the human family tree (pg. 237) <b>Essay:</b> Would you consider or hesitate in submitting a sample of your DNA for analysis to Bryan Sykes "Oxford Ancestors"?
11	W 3/26	Law and DNA: Fingerprinting to Patents	Watson: Ch. 10	<b>Comp. Book:</b> define genetic fingerprinting and sketch how it works. <b>Essay:</b> Should all people be "DNA fingerprinted" at birth? <b>Essay:</b> Is there a difference between using DNA data for criminal investigation vs. paternity testing?
12	W 4/2	Gene Hunting: DNA and Genetic Disease	Watson: Ch. 11	<b>Comp. Book:</b> Summarize Nancy Wexler's research <b>Essay:</b> Would you want to be tested for the BRCA1 gene, and how would the results change your life?
13	W 4/9	Defying Disease: Modifying our Genetic Code	Watson: Ch. 12	<b>Submit Book Review</b> <b>Essay:</b> Would you consider genetic testing before you get married or before conceiving a child? Do you agree with Wexler's statement, "genetic knowledge can be a scary prospect"? <b>Essay:</b> If possible to cure a disease, is gene therapy ethical?
14	W 4/16	DNA and the Mind: Nature vs. Nurture <b>Present Creative Projects</b>	Watson: Ch. 13 + CODA	<b>Present Creative Projects</b> <b>Comp. Book:</b> define Epigenetics, Summarize Lysenko. <b>Essay:</b> Does who you are depend more on your genetic sequence or on the experiences/exposures you have in life? <b>Essay:</b> What do you make of claims such as a "violence gene" "grammar gene", or "God gene" and do you agree with GATTACA's claim that, "There is no gene for the human spirit?"
15	W 4/23	<b>Present Class Debates</b> <b>Turn in Composition Books</b>	As assigned	<b>Present Class Debates</b> <b>Turn in Composition Books</b>
16	W 4/30	<b>Final Exam</b> 6-8 pm , Final Topic Essay	As assigned	Final Topic Essays

