

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



**COURSE OUTLINE**

**COURSE TITLE:** Introductory Human Genetics

**CODE NO. :** BIO131

**SEMESTER:** Winter 2007

**PROGRAM:**

**AUTHOR:** L. Uhlig

**DATE:** Jan. 2007

**PREVIOUS OUTLINE DATED:** January 2005

**APPROVED:**

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**DEAN**

\_\_\_\_\_  
**DATE**

**TOTAL CREDITS:** 3

**PREREQUISITE(S):** OAC Biology or Grade 12 U or C Biology or BIO122 or equivalent

**HOURS/WEEK:** 3

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*For additional information, please contact the Dean*  
*School of Health and Human Services*  
*(705) 759-2554, Ext. 2689*

**I. COURSE DESCRIPTION:**

This course is designed to introduce students to the fundamental concepts of genetics and to the application of those concepts to an understanding of human genetics. The role of both genes and the environment in the determination of human traits and diseases will be discussed. Emphasis will be placed on the development of analytical thinking and problem solving skills and will be facilitated by the discussion of human case studies.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

Upon successful completion of this course, the student will demonstrate the ability to:

1. Define the structure of genes and DNA.
2. Describe how DNA replicates and how genes are expressed.
3. Describe the mechanics of mitosis and meiosis and understand the functional significance of these events in the lives of cells and organisms.
4. Understand the various ways in which genes interact with one another to produce human traits in both health and disease; i.e. dominant/recessive, co-dominant, sex-linked inheritance patterns. Also understand the contributions/modifications made by the environment to these relationships.
5. Construct a pedigree chart detailing inheritance patterns of human traits using the correct conventions for symbols and organization. Make use of probability rules to estimate the likelihood/risk of inheriting particular alleles by a particular individual.
6. Analyze data from both pedigree and case study sources in order to ascertain, when possible, the inheritance patterns of human traits.
7. Define the various ways in which genetic testing is done and used to further knowledge of and treatment for genetic disease states in humans.
8. Understand the contributions that the research community and especially the human genome project is making towards expansion of knowledge about human genetics.

**III. TOPICS:**

1. Introduction to Genetics
2. The Cell Cycle; Mitosis and Meiosis
3. Mendelian Inheritance Patterns
4. Pedigree Analysis in Human Genetics
5. Beyond Mendel; Multiple Genes and Multifactorial Traits
6. Sex-Linked Inheritance
7. Why Do I Do That? Behavioural Genetics
8. DNA Structure and Replication
9. From DNA to Proteins: Gene Expression
10. Mutations and Chromosomal Structure
11. The Advent of Eutopia? Cloning, Biotechnology and Genomics
12. The Genetics of Immunity and Cancer
13. Gene Therapy and Genetic Counselling
14. The Human Genome Project: Progress to Date and Uses

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

*The following text package is available in the campus shop and includes both the text and study guide components packaged together under ISBN# 0495420492:*

1. Cummings, Michael R. (2006). *Human Heredity Principles and Issues*. 7e. Toronto, ON: Thomson/Brooks/Cole.
2. Shontz, Nancy N. (2006). *Study Guide for Cummings' Human Heredity*. 7e. Toronto, ON: Thomson/Brooks/Cole.

**V. EVALUATION PROCESS/GRADING SYSTEM:**

1. The pass mark for this course is 50%. It is composed of lecture tests, a term assignment and a final exam
2. Evaluation Methods:

	<b>% of Final Grade</b>
Term Test 1	20%
Term Test 2	20%
Term Test 3	20%
Term Assignment	20%
Final Exam	20%

**MIDTERM GRADES:**

The determination of midterm grades as "S" or "U" will be based on cumulative grades of all tests completed up to the date of submission of midterm grades. Any student who does not achieve a passing grade on the majority of graded work will receive a "U" grade at midterm.

The following semester grades will be assigned to students in postsecondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

## VI. SPECIAL NOTES:

### Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Special Needs office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

### Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other post-secondary institutions.

### Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Code of Conduct*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

**VII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

**VIII. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.