

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



**SAULT  
COLLEGE**

**COURSE OUTLINE**

|                         |  |                                |                  |
|-------------------------|--|--------------------------------|------------------|
| <b>COURSE TITLE:</b>    | Introductory Human Genetics                                    |                                |                  |
| <b>CODE NO. :</b>       | BIO131   | <b>SEMESTER:</b>               | Winter<br>2016   |
| <b>PROGRAM:</b>         | Collaborative BScN   |                                |                  |
| <b>AUTHOR:</b>          | L. Dafoe   |                                |                  |
| <b>DATE:</b>            | Jan. 2016  | <b>PREVIOUS OUTLINE DATED:</b> | Jan. 2014        |
| <b>APPROVED:</b>        | <i>"Marilyn King"</i>  |                                | <i>Dec. 2015</i> |
|                         | <hr/>  |                                | <hr/>            |
|                         | <b>CHAIR, HEALTH Programs</b>                                  | <b>DATE</b>                    |                  |
| <b>TOTAL CREDITS:</b>   | 3  |                                |                  |
| <b>PREREQUISITE(S):</b> | OAC Biology or Grade 12 U or C Biology or BIO122 or equivalent |                                |                  |
| <b>HOURS/WEEK:</b>      | 3  |                                |                  |

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*For additional information, please contact the Chair, Health Programs*  
*School of Health Wellness and Continuing Education*  
*(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 genetics case studies.

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

Upon successful completion of this course, the student will demonstrate the ability to understand the fundamental principles of genetics and apply those principles to an understanding of the contribution that genetic factors make to human traits, diseases and disorders.

1. Students will be familiar with the structure and function of DNA.  
Potential Elements of the Performance:  
Describe the structure of DNA, and how this structure provides an explanation for the reliable reproduction, function and transmission of genetic information between cells and organisms.
2. Students will understand how genetic information is passed from parents to offspring.  
Potential Elements of the Performance:  
Be able to follow the fate of a particular allele through meiosis. Show the significance of Mendel's two laws.
3. Students will understand how to construct and interpret human pedigree data.  
Potential Elements of the Performance:  
Construct a human pedigree chart, detailing inheritance patterns of human traits using the correct conventions for symbols and organization, for one or more traits and be able to predict the risk of acquiring a particular trait/allele for future members of the family.
4. Students will understand the various ways in which genes behave, and how they interact with one another and the environment to influence/determine human traits in both health and disease.  
Potential Elements of the Performance:  
Be able to determine whether a trait is inherited through a dominant/recessive, co-dominant, or sex-linked inheritance pattern. Describe the outcomes of various forms of polyploidy/euploidy. Describe various multi-factorial traits, and be able to estimate the relative contributions/modifications made both genes and the environment to these traits. Analyze data from pedigree and/or case study sources in order to ascertain, when possible, the inheritance patterns of human traits.
5. Students will know the various ways in which genetic testing is done and used to further knowledge of and treatment for genetic disease states in humans. Students will also understand the ethical considerations of these new technologies.

Potential Elements of the Performance:

Beginning with a case study from the literature, suggest a particular testing technique to use in order to provide a family with the information required for an informed decision about treatment modalities to be used for their family member. Outline the various ethical concerns/considerations for various types of testing, and for how the results of this testing is or can be shared.

- Students will comprehend the contributions that the research community and especially the human genome project is making towards expansion of knowledge about human genetics.

Potential Elements of the Performance:

Using information from scholarly sources, provide a brief summary of the current knowledge about a particular genetically-influenced or genetically-determined human trait.

**III. TOPICS:**

- Introduction
- Quick review of mitosis/meiosis/DNA
- Our Beginnings as Humans; sex and development
- Reproduction; what if you can't do so on your own?
- Changes in Chromosome Number; there's something wrong with the baby
- How Genes are Passed On; why don't I look more like my dad?
- Genetic Testing and Prenatal Diagnosis; what do we tell the parents?
- Polygenic & Multifactorial Inheritance; it's more than just genes
- Behaviour; it's in your genes
- Cancer; genes behaving badly
- Forensics; genes in the public domain
- The Human Genome Project; what are we finding out NOW?
- Ethics; wrestling with our individual and collective consciences

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

Yashon, Ronnee K. and Cummings, Michael R. (2012). *Human Genetics and Society*, 2e. Brooks/Cole.  
ISBN-ISBN-13: 9780538733212

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

- The pass mark for this course is 50%. It is composed of lecture tests, a term assignment and a final exam

- Evaluation Methods:

**% of Final Grade**

|                  |     |
|------------------|-----|
| Term Test 1      | 10% |
| Term Test 2      | 20% |
| Term Test 3      | 20% |
| Term Assignments | 30% |
| Final Exam       | 20% |

The following semester grades will be assigned to students in post-secondary 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.  |                               |
| 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.  |                               |

**Note:** For such reasons as program certification or program articulation, certain courses require minimums of greater than 50% and/or have mandatory components to achieve a passing grade.

It is also important to note, that the minimum overall GPA required in order to graduate from a Sault College program remains 2.0.

If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

## VI. SPECIAL NOTES:

### Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

## VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.