BIOC15 Summer Genetics Course Syllabus
Drs. Clare Hasenkampf and Patti Stronghill

WELCOME TO GENETICS!
In this course we consider many important areas of genetic study including eukaryotic patterns of inheritance, genetic mapping, mutation and use of genetics for understanding gene function, chromosome organization and mutation, and Recombinant DNA technology and genome analysis. To take this course you need to have successfully completed BIOB10H, BIOB11H and *either* MATA21, MATA35, MATA36, MATA37, STAB22 or PSYB07 or an equivalent course. Prerequisites are enforced for your benefit.

The knowledge you learn in this course is valuable for the practice of health or veterinary-related science, genetic counseling, genetic diagnostics, the use of genetics and molecular technologies to better understand complex biological processes, and for serving as a science-literate citizen in a complex world. **If you keep up with the workload of this course it is also fun**!

INTERACTION TIMES

Lectures for this course are Tuesdays 9-11 in MW120 (there are two, in class tests at this time) and Wednesdays 9-10 in MW120.

Students and a TA meet once per week in SW242, P001 Wednesdays 2-5; P002 will be Thursdays 2-5. Students organize into teams; each team has some lab work outside of the normal practical meetings (see flextime schedule); it is absolutely necessary that you form a functional, healthy team.

Dr. H's regular office hours are Tuesdays 4-6 in SW242 (except not June 18th)
email questions welcome! (hasenkampf@utsc.utoronto.ca), but allow two working days for response time. She will also have one special pretest session before each test.
Dr. H is available for all questions about lectures and test content and is also able to provide advice about our biology programs and post-graduation planning.

Dr. Stronghill is dealing with all aspects of the laboratory portion of the course. She is available for questions about the labs each Thursday5-7 and Friday 4-6 in SW242 through July 12th. She also takes email questions; her email is stronghill@utsc.utoronto.ca

LEARNING OBJECTIVES

1. Students will be able to inter-relate chromosome behavior during meiosis with the key rules of inheritance: segregation of alleles, independent assortment, sex linkage, linkage, and maternal inheritance.

2. Students will combine their knowledge of probability theory with the rules of inheritance to do pedigree analysis and accurately predict genetic outcomes. Additionally students will be able to interpret pedigrees and phenotypic ratios to determine if genes are autosomal or sex-linked, linked or sorting independently, and genotypes of parents.

3. Students will develop an appreciation of how genes work within organisms and will be able to use this knowledge to understand and predict phenotypic ratios. Also they will be able to interpret phenotypic ratios to identify the number of genes, allelic relationships, dominance relationships, and types of interaction gene interactions in biological pathways.

4. Students will do genetic crosses using the model organism *Drosophila melanogaster* to deduce the genotype, mode of inheritance, dominance relationship(s) and recombination frequency map distances and interference of several Drosophila genes. These classical genetic techniques will provide students with first hand experience with the rigor and precision needed to perform biological experiments, and with the difficulties, frustrations and errors that can occur.

5. Students will gain experience working collaboratively as part of a team to accomplish the work of a set of experiments. This includes learning to distribute a task's workload equitably and giving each other productive feedback in a professional and constructive manner.

6. Students will evaluate their data and create a group oral and an individually written report of their experiment that effectively communicate complex ideas to colleagues.

7. Students will efficiently search the primary literature for an article related to their experiment, and provide a concise analysis of key findings of the research article as it relates to their own experiment.

8. Students will examine the cellular processes that combat DNA damage and replication errors, and will be able to analyze how mutations can be used to explore biological processes, genome structure and evolution.

9. Students will be able to characterize the types of DNA and chromosomal mutations and will understand the origins and consequences of these mutations.

10. Students will be able to describe the key molecular technologies that led to the sequencing of the human genome (and other model organisms) and will understand how entire genome sequencing has led to systems approaches to understanding biochemical and developmental pathways, human diseases and related therapeutic approaches.

To do well in this course it is vital to keep up with the work on a weekly basis: understanding the key concepts, completing assigned problems to develop skill in using the concepts, and doing weekly lab work on time. For example, by Tuesday of week 2 you will need to understand and be able to use, the material of week 1, etc throughout the course.

COMMUNICATION INFORMATION

Course announcements, communications and lecture notes will be available on the BIOC15 Blackboard course site. Be sure you have a UTSCid and Utorid and know how to access the Blackboard sites. Check the Blackboard site regularly for important, time-sensitive announcements.

Normally, students will be required to submit their course essays to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site. You will be given instructions on how to submit your assignment to TurnItIn by your Teaching Assistant in advance of the submission deadline.

Lecture class notes likely will be posted within 24 hrs AFTER the relevant class meeting. But creating a class with effective learning is a two-way exchange; I need your quesitons and interactions to understand how well I am getting the ideas across, so I need many students attending class!

Learn the name of your TA and interact with your TA and fellow students with respect. They are your important learning partners! Questions about lab work and assignments, lab quizzes etc should be addressed to your TA.

Course evaluations for this course will be done on-line and can be accessed via the Blackboard course site; please participate. Your assessments and insights are important!

ABSENCE POLICY

If you are prevented from attending or completing a course requirement (test, lab, assignemnt), due to any illness or other circumstance of a grave nature, contact Dr. Stornghill by email within three days of the missed requirement, clearly stating the reason. This explanation should be accompanied by a completed of the 'Verification of illness or injury' form or other official documentation of the grave circumstance. These documents will be used to determine eligibility to recover any lost marks.

The 'verification of illness or injury' form can be found at http://www.illnessverification.utoronto.ca/getattachment/index/Verification-of-Illness-or-Injury-form-Jan-22-2013.pdf.aspx

A copy of the form is provided on the last page of the syllabus. Acquaint yourself with its content such that in case of an emergency you can obtain the essential information required, even in the absence of the official form.

Remember this course is about learning Genetics. When you are well, work hard and engage! If you are sick, take care of yourself, do what you can from home and get back into the swing of the course once you are well.

IMPORTANT ACQUISITIONS

The textbook for this course is Genetics from Genes to Genomes, 4th edition by Hartwell, Hood, Goldberg, Reynolds, Silver and Veres. It is packed as a bundle with the Solutions manual. The textbook/solutions manual bundle may be purchased at the bookstore. The third edition is acceptable too. The lab manual is posted on the Blackboard course site. You need to download your copy and bring the relevant part to every lab.

INFORMATION ON TERM TESTS AND COURSE ASSIGNMENTS

There will be two, IN CLASS term tests (Tuesday May 28th and Tuesday July 28th) and a comprehensive final exam. (The final exam is held during the examination period).

There will be no makeup test for the two, term tests. Anyone missing either of the term tests (and who has a **valid** and **documented** medical or serious personal problem to miss that test) will have access to that test and have access to the answers (for self-assessment), but will recover the lost marks by having to take a final exam which has the relevant portion of the comprehensive final exam more heavily weighted (and may include a few extra questions) and the final exam will be worth more of their final grade.

Anyone without an acceptable (and documentable) reason for missing a test (or assignment or lab) will receive the grade of zero for the relevant work. To be eligible to recover the marks missed on a test, etc. See the earlier section on notification and documentation policy.

Test content, and the level of detail of tests and the exam will be as covered in the lecture class notes, assigned problems, assigned independent reading, the figures from the textbook (as assigned in the lecture class notes) definitions in bold in the lab manual and the questions and answers posed within the lab manual. In our class meetings I try to highlight the most important and/or most challenging concepts and applications, but the posted lecture class notes are the definitive source for lecture content that might be included on the two in class tests or the final exam.

FINAL EXAM

The final exam in this course is comprehensive in nature, covering topics from throughout the course. The Final exam will be held in the examination period. Anyone absent from the Final exam must petition the registrar's office to take a deferred exam.

LAB MEETINGS

Each of you is assigned to one practical section that you must attend on a weekly basis. In addition to this time period, you must also work with your lab team, having some members attend the genetics lab at other posted times to create your genetic crosses and collect data. Attendance in labs is mandatory; absence will reduce your mark. The success of your genetic crosses requires coordinated teamwork. Please develop a good working relationship and effective communication system with your team members.

The ability to work as part of a team is an important life skill; use this course as an opportunity to improve your abilities, make new friends and explore the idea of a career with lab work. The lab work is designed to reinforce the concepts and problems considered in the class meetings and assessed on the tests and exam. If you fully engage with the lab work it will improve your learning in genetics.

MARKING SCHEME FOR THE COURSE

Test 1 in class	17 %	
Test 2 in class	17 %	
Final exam	42 %	(Comprehensive for all lectures) in final exam period
Lab performance	12%	(attendance, participation, ability to work fairly and effectively as a team-member, lab assignments
Oral report	2%	
Written lab report	10%	

The University of Toronto is dedicated to fostering an academic community in which the learning and scholarship of every member may flourish, with vigilant protection for individual human rights, and a resolute commitment to the principles of equal opportunity, equity and justice. The instructors and Teaching Assistants of BGYC15 fully endorse this policy.

ACADEMIC INTEGRITY

The University treats cases of cheating and plagiarism very seriously. The University of Toronto's *Code of Behaviour on Academic Matters* (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences.

Potential offences in papers and assignments include: using someone else's ideas or words without appropriate acknowledgement, submitting your own work in more than one course without the permission of the instructor, making up sources or facts, obtaining or providing unauthorized assistance on any assignment.

On tests and exams cheating includes using or possessing unauthorized aids, looking at someone else's answers during an exam or test, misrepresenting your identity, or falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

ACCESSABILITY

Students with diverse learning styles and needs are welcome in this course! In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible. I will work with you and AccessAbility Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC AccessAbility Services staff (located in SW302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or ability@utsc.utoronto.ca.

Volunteer Notetakers welcome find out more at
http://www.utsc.utoronto.ca/~ability/involved_notetaker.htm

Course schedule with topics, test and major assignments
Test date and assignment dates are firm; topic dates may vary a little

May 7, 8	The Patterns of How Genes Are Transmitted (Chapter 2)
May 14, 15	How Genes (& environment) interact to determine phenotypes (Chapter 3 Mutational & Analysis
May 21, 22	Nuclear Division & the Chromosome Behavior Accounts for the Inheritance of Nuclear Genes (Chapter 4)
May 24	Special PreTest Office hours SW242 4-6
May 28	**Test 1**
May 29	Test 1 debrief
June 4,5,11	Mapping genes to chromosomes using organismal phenotypes (Chapter 5)
June 12	Mapping and statistics
June 17- June 21	Reading Week--lab open in afternoon for fly work
June 25,26	Recombinant DNA Technology, (Chapter 9)
June 28	Special pre-test2 office hours (SW242) 4-6pm
July 2	**Test 2**
July 3	Test 2 debrief
July 9, 10	DNA and Genome Sequencing, The Human Genome Sequencing Initiative, Results and Genomic Approaches (Chapter 10 and Parts of 11)
July 10, July 11	**Oral reports in lab practicals**
July 16,17	Genomic Technologies (Chapter 11)
July 16	**Lab reports due, paper copy and electronic version to Turn It In**
July 23, 24	DNA Damage, Repair and Gene Mutation (Chapter 7)
July 30, 31	Chromosomal mutations

The written reports are due on Tuesday July 16th, 6 pm. Written reports can be dropped off to Gloria Luza in SW420B up until 4 pm, or deliver the report directly to Dr H at her office hours. (Note from July 16th onward Dr H office hours are in IC367.)

Please have confidence in your own abilities, and be sure the report is all your own writing. Make all your hard work 'pay off' with a good grade soPLEASE TURN IN YOUR REPORT ON TIME for the best chance for a high mark and to allow you time to move on to your other important commitments!

Verification form for Illness or Injury on next page

Verification of Student Illness or Injury

To be completed only by a Physician, Surgeon, Nurse Practitioner, Registered Psychologist or Dentist

1. TO BE COMPLETED BY THE STUDENT: STUDENT#_____

I, (please print)_____ authorize this practitioner to provide the information on this form relating to my request for special consideration to the University of Toronto, and to verify the information as required.

_____ _____

STUDENT SIGNATURE DATE

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2. TO BE COMPLETED BY THE LICENSED PRACTITIONER: *Please indicate below the effect of the illness, injury and/or treatment on the student's ability to learn, communicate, concentrate, participate in academic activities as well as his/her decision making capacity and motivation.*

Initial *the most relevant category*		**Degree of Incapacitation on Academic Functioning**	**Start Date**	**Anticipated End Date**
	Severe	Completely unable to function at any academic level e.g. unable to attend classes, or fulfill any academic obligations.		
	Serious	Significantly impaired in ability to fulfill academic obligations e.g. unable to complete an assignment, unable to write a test/examination		
	Moderate	May be able to fulfill some academic obligations but performance considerably affected e.g. able to attend some classes, decreased concentration, assignments may be late		
	Mild	Likely to be able to fulfill academic obligations, but performance affected to a minor degree, with mild impairment and minimal symptoms		
	Negligible	Unlikely to have an effect on ability to fulfill academic obligations		

√	**Frequency and/or timeline of contact with student relevant to present illness/episode of illness/injury**
☐	**Once Only - Visit Date:**
☐	**Multiple/On-going - Visit Dates:**

Additional Comments:

3. VERIFICATION BY THE LICENSED PRACTITIONER:

This form is based on examination and applicable documented history at the time of illness or injury, not after the fact. I certify that this assessment falls within my legislated scope of practice.

_____ Business stamp, with address and telephone

NAME (Please Print)

_____

Licencing Body and REGISTRATION #

_____ _____

SIGNATURE DATE

The University of Toronto respects personal privacy. Personal information that is provided on this form is used by the University to verify effects of illness or injury on your capabilities and necessary related purposes. At all times it will be protected in accordance with the Freedom of Information and Protection of Privacy Act. If you have questions, please contact your campus administrator.

Alteration or falsification of information on this form may constitute an academic offence under the Code of Behaviour on Academic Matters and may be prosecuted as such.

Completion of this form does not guarantee that special consideration will be granted. Incomplete forms will not be processed. In some appeal situations, the University may require additional information from you or your practitioner to decide whether or not to grant or confirm special consideration.

PLEASE RETAIN A COPY FOR YOUR FILES