

GENETICS REFRESHER COURSE LIST

Approved: December 2009

Courses on this list are approved for members who are eligible to practice in cytogenetics and/or molecular genetics.

Please note: This list is a summary of course information. Applicants should contact the institution offering the course(s) for the most up-to-date detailed information/registration protocols.

All refresher/updating courses must have an evaluation component and the transcript **MUST** state the number of hours in the course.

Shaded areas are available by distance education.

NOTE: Other courses will be considered for approval by the Registration Committee when a request and the course outline are submitted to the ~~RD/70~~.

University	Course	Prerequisite
Athabasca University www.athabascau.ca/courses/biol/341/	BIOL 341 Human Genetics This course introduces the laws of heredity as they apply to humans and to the study of inherited traits. The course covers a number of other related topics, including sex determination, the composition and function of genes, the causes and effects of mutation, population genetics, the genetics of immunity and cancer, the contribution of heredity to behaviour and intelligence, genetic counseling, and genetic engineering. Continuous enrolment.	BIOL 204 Principles of Biology I and BIOL 205 Principles of Biology II or equivalent. \$744 includes textbook, video, study guide, and student manual.
Brock University www.brocku.ca	BIOL 2F01 Principles of Molecular and Cellular Biology WINTER 3 lecture/seminar, 3 lab Cellular processes and their relationship to cellular structure with emphasis on the structure and function of proteins, membranes, cell organelles and the expression of genetic information. Restriction: students must have a minimum of 3.0 overall credits.	BIOL 1F90 Concepts in Biology and CHEM 1F92 Chemistry
	BIOL 3P50 (or BTEC 3P50) Molecular Genetics 3 lecture, 3 lab for 6 weeks Topics include the genetic code and information flow from nucleic acids to proteins, RNA and protein synthesis; prokaryotic and eukaryotic chromosomes; gene organization; transcription, RNA processing; codon usage; enhancers and transposons. Restriction: students must have a minimum of 8.0 overall credits.	BIOL 2F01 Principles of Molecular and Cellular Biology, or permission of instructor.
	BIOL 3P51 (or CHSC 3P51) Genetics: Transmission, Development, Population 3 lecture, 3 lab for 6 weeks Concepts of classical genetics including genetic mapping, extra-nuclear inheritance, polyploidy, genetics and development,	BIOL 2F01 Principles of Molecular and Cellular Biology, or permission of the instructor.

University	Course	Prerequisite
	evolutionary genetics. Restriction: students must have a minimum of 8.0 overall credits.	
Carleton University www.carleton.ca	BIOL 2104 Introductory Genetics 3 lecture, 3 lab and/or tutorial half-course A lecture and laboratory course on the mechanisms of inheritance and the nature of gene structure, composition and function. It introduces both classical Mendelian genetics and modern molecular genetics.	BIOL 1003 Introductory Biology and BIOL 1004, or permission of the department.
	BIOL 2106 Human Genetics and Evolution 3 lecture half-course Designed for students interested in learning about the genetic mechanisms involved in human development (embryogenesis, reproduction and aging), diseases, cancer, behaviour, environmental adaptation and evolution. Not a Science continuation course. Available to students in a Biology or other Science program only as free elective, but credit will be given for BIOL 2106 only if taken before 2104 or 2105.	A general biology course at the OAC level or equivalent.
	BIOL 3104 Molecular Genetics 3 lecture half-course A lecture course dealing with modern advances in molecular genetics. Not offered in the Winter 2010 term	BIOL 2104 Introductory Genetics or permission of the Department
	BIOL 4103 Population Genetics 3 lecture/seminar half-course Basic ideas of population structure, equilibrium, selection mutation, genetic drift.	BIOL 2104 Intro Genetics or permission. A course in statistics is highly recommended.

University	Course	Prerequisite
	<p>BIOL 4104 Evolutionary Genetics 3 lecture/seminar half-course A continuation of BIOL 4103 dealing with molecular evidence of evolution, speciation as well as the analysis of biometrical traits.</p> <p>Not offered in the Winter 2010 term</p>	<p>BIOL 4103 Population Genetics and BIOL 3609 Evolutionary Concepts or by permission of the Dept. A course in statistics is highly recommended.</p>
<p>Carleton University www.carleton.ca</p>	<p>BIOL 4106 Methods in Molecular Genetics 3 lecture/seminar half-course This course reviews the use of current techniques in molecular genetics and examines some innovative approaches to problems in molecular and cellular biology and biochemistry. There will be an emphasis on genomes and proteomics.</p> <p>Not offered in the Winter 2010 term</p>	<p>BIOL 2104 Introductory Genetics, BIOL 3104 Molecular Genetics or BIOL 2105, and BIOL 2303 Microbiology</p>
	<p>BIOL 4109 Laboratory Techniques in Molecular Genetics 6 lecture/lab a week in 2 sessions, half-course This laboratory course is complementary to BIOL 4106. It is designed to give the student some practical familiarity with methodology in molecular genetic techniques. The laboratory is suitable for students with a developing interest in problems of molecular and cellular biology and biochemistry.</p> <p>Limited enrolment.</p>	<p>BIOL 2303 Microbiology or BIOL 3303 (or equivalent), and a course in Biochemistry or by permission of the department.</p>

<p>Charles Sturt University, Australia www.csu.edu.au</p>	<p>BMS240 Human Molecular Genetics This subject contains basic genetic principles and mechanisms with a focus on humans and theory of molecular biology. It introduces molecular biology tools and their application to mutation detection. Ethical issues related to research, social issues, prenatal diagnosis and screening are discussed using case studies as a focus.</p> <p>Upon successful completion of this subject, students should:</p> <ul style="list-style-type: none"> • appreciate that DNA is the genetic 	<p>CHM107 Chemistry 1B and BMS130 Physiological Sciences 2 or BMS128 Human Anatomy and Physiology</p> <p>\$1,610 AUD (2009 fee) Contact university for further information</p>
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	<p>material in humans;</p> <ul style="list-style-type: none"> • describe the structure of DNA; • outline how mutations result from alterations in DNA structure; • describe the flow of genetic information from DNA through to expression as cellular constituents and structure; • describe basic DNA mechanisms of replication, translation and transcription; • describe how genetic information is stored in chromosomes; • distinguish between the processes of mitosis and meiosis and their implications in terms of the inheritance of genetic material; • distinguish different modes of inheritance dominant/recessive; autosomal/sex-linked; non-Mendelian; multifactorial; • understand genetic diseases, and describe the role of mutations in their aetiology and the range of human genetic diseases; • outline the range of molecular biology tools and their application to mutation detection for diagnosis of, or screening for, genetic diseases; • demonstrate an awareness of ethical issues related to genetics - research, social issues, prenatal diagnosis and population screening. 	
<p>Charles Sturt University, Australia www.csu.edu.au</p>	<p>BMS241 Molecular Cell Biology This subject introduces the current model of eukaryotic cell at a molecular level, detailing aspects of cellular structure and function, regulation, the cell cycle and the flow of genetic information. It links aspects of biochemistry and genetics as they pertain to cell functioning and fits this knowledge into the broader context of organism structure, cancer development and embryological</p>	<p>BMS240 Human Molecular Genetics</p> <p>\$1,610 AUD (2009 fee)</p> <p>Contact university for further information</p>

	<p>development.</p> <p>Upon successful completion of this subject, students should:</p> <ul style="list-style-type: none"> • demonstrate an understanding of the cell as a basic unit of life including the organisation of cells and their composition and metabolism. • describe in detail the flow of genetic information from DNA through to expression as cellular constituents and structure. • outline the cell structure and function, including subcellular structure, active and passive transport, bioenergetics, the cytoskeleton and cell movement. • describe the processes of cell regulation including gene regulation, cell signalling, the cell cycle and development, differentiation and programmed cell death. • perform basic molecular genetic analytical procedures. 	
<p>Charles Sturt University, Australia www.csu.edu.au</p>	<p>BMS304 DNA and Forensic Technology</p> <p>This subject gives an overview of the cellular, biochemical, genetic and molecular foundations of human diversity. The underlying principles behind the detection and analysis of phenotypic and genotypic variations will be examined.</p> <p>Upon completion of this subject, students will be able to:</p> <ul style="list-style-type: none"> • appreciate the basis of cellular, biochemical and genetic diversity in humans • understand the biochemical principles behind the identification of key biological substances commonly encountered in forensic practice • describe the principles behind methods for the detection of hyperviable human biomolecules • describe the analytical methods behind a number of common genetic tests 	<p>BMS241 Molecular Cell Biology</p> <p>\$1,610 AUD (2009 fee)</p> <p>Contact university for further information</p>

	<p>currently used for forensic human identification purposes</p> <ul style="list-style-type: none"> • evaluate new forensic and diagnostic technologies. 	
<p>Charles Sturt University, Australia www.csu.edu.au</p>	<p>BMS305 Genetic Engineering & Bioinformatics</p> <p>An advanced level subject with an intensive practical schedule that familiarises students with techniques used in gene manipulation or genetic engineering and related innovative applications in modern medical biotechnology. This subject will also provide a sound introduction to bioinformatics through lectures and practical experience.</p> <p>Upon completion of this subject you should be able to:</p> <ul style="list-style-type: none"> • Outline the range of genes implicated in common medical disorders and the variety of therapeutic, diagnostic and preventative methods developed to combat disease; • Describe the range of techniques in genetic manipulation, the cloning vectors available and the containment procedures required; • Identify strategies for gene isolation, construction of libraries, DNA and peptide synthesis and DNA sequencing; • Describe the diagnostic, forensic, and medical applications of recombinant DNA technology. • Appreciate the complexities associated with engineering the expression of recombinant genes of medical or therapeutic importance, e.g. human insulin, epidermal growth fact, human somatomammotrophin, human dystrophin genes 	<p>BMS241 Molecular Cell Biology</p> <p>\$1,610 AUD (2009 fee)</p> <p>Contact university for further information</p>

University	Course	Prerequisite
<p>Lakehead University www.lakeheadu.ca</p>	<p>Biology 2171 Genetics WINTER 3 lecture half-course An introduction to the principles of inheritance, modern gene concepts and basic population genetics is presented in a lecture and problem-solving format.</p>	
	<p>Biology 3135 Molecular Genetics FALL 3 lecture/3 labs half-course Isolation and identification of genes, analysis of gene structure, gene expression and its regulation, with emphasis on molecular genetics of prokaryotic microorganisms and their viruses. Major topics covered include: mutagenesis, conjugation, recombination, gene regulation, plasmids, transposons, bacteriophage and genomics. Limited enrolment.</p>	<p>Biology 2910 or Biology 3352/Chemistry 3251, Biology 2171, 2230, and 2711; or permission of the instructor</p>
<p>Laurentian University cce.laurentian.ca</p>	<p>BIOL 2011 EL Fundamentals of Genetics This course deals with the replication, modification, transmission and function of the genetic information in living organisms. Check for availability Credit cannot be retained for both BIOL 2011 and 3017. Not available for credit in the Bachelor of Science programs in Biology. (Available only through Continuing Education.)</p>	<p>BIOL 1506 Biology I; OAC Chemistry, CHMI 1030/1032 or 1041. Approximately \$560.</p>
<p>www.laurentian.ca</p>	<p>BIOL 3017 EL Genetics 3 lecture, 3 lab An introduction to the science of genetics. The following topics will be considered: Mendelian inheritance; the nature and behaviour of chromosomes; the chemical basis of heredity; linkage, crossing over and the mapping of chromosomes: variations in chromosome structure and number; mutation; the structure and function of genes; the use of statistics in the genetic analysis of quantitative characters.</p>	<p>BIOL 1506 Biology I and BIOL 1507 Biology II Approximately \$510.</p>

University	Course	Prerequisite
<p>McMaster University registrar.mcmaster.ca/calendar</p>	<p>BIOLOGY 2C03 Genetics 3 lecture, 1 tutorial; one term Structure, function and transmission of genes; chromosomal basis of inheritance; mono- and dihybrid crosses; sequential steps in gene function; linkage maps; sex chromosome inheritance. Limited enrolment.</p>	<p>BIO 1A03 Cellular and Molecular Biology, and BIO 1AA3, and CHEM 1AA3 Intro Chemistry II or ISCI 1A24; plus registration in an Honours program in Faculty of Science, Health Sciences, Arts & Science, or Kinesiology</p>
	<p>BIOLOGY 3H03 Molecular Biology of the Nucleus FALL 2 lecture, 1 tutorial; one term Structure of the nucleus and of chromatin; organization of DNA sequences; DNA replication, transcription; gene expression; some relevant techniques.</p>	<p>BIO 2B03 Cell Biology</p>
	<p>BIOLOGY 3I03 Eukaryotic Genetics WINTER 3 lecture; one term Molecular genetics of eukaryotes, with focus on molecular mechanisms of eukaryotic DNA replication, DNA repair and recombination, cell cycle and cancer, telomeres and telomerase.</p>	<p>BIO 2B03 Cell Biology and BIO 2C03 Genetics</p>
	<p>BIOLOGY 4E03 Population Genetics WINTER 3 lecture; or 2 lecture, 1 tutorial Conceptual foundations of evolutionary theory and principles of population genetics.</p>	<p>BIO 2C03 Genetics and BIO 3FF3 Evolution, and registration in Level III or above of any Honours program</p>
	<p>BIOLOGY 3V03 Techniques in Molecular Genetics WINTER 1 lecture, 2 lab (3 hrs each); one term. A laboratory course involving basic experiments in Molecular Genetics. Limited enrolment</p>	<p>Credit or registration in BIO 3003, and registration in Level III or IV of any Honours Biology program, or by permission of the instructor.</p>

University	Course	Prerequisite
<p>McMaster University registrar.mcmaster.ca/calendar</p>	<p>BIOLOGY 4DD3 Molecular Evolution 2 lecture and 1 tutorial; one term The study of how molecules change over time within and between species. The experimental data, techniques and theories will be examined. Offered in alternate years. NOT offered in 2009-2010.</p>	<p>ANTHROP 2D03 Genetics in Anthropology or BIO 3FF3 Evolution and registration in Level III or above of any Honours program</p>
<p>Bachelor of Health Sciences (Honours) Program</p>	<p>HTH SCI BIOCHEM 4J03 Biochemical Immunology (formerly MOL BIOL 4J03) 2 lecture, 1 tutorial; one term This advanced course applies small group based learning to immunological problems. Topics concern development of immunoassays, resistance to infection and immunity in health and disease.</p>	<p>HTH SCI 3I03 and HTH SCI 4I13; or permission of the instructor</p>
<p>Queen's University www.queensu.ca</p>	<p>BIOL-110* Human Genetics and Evolution FALL 3 lectures, 1 tutorial half-course Introductory genetics and evolutionary processes as they relate to the human condition - genetic diseases, medical techniques, inheritance and ethical issues such as cloning and genetically modified foods. Note: Students who are currently taking or have previously taken BIOL-102*/103* may not take BIOL-110* for credit.</p>	
	<p>BIOL-206* Evolutionary Genetics WINTER 3 lecture, 3 lab half-course An introduction to the genetic mechanisms of population differentiation and evolutionary change, from molecules to species. The genetical theory of evolution is also applied to problems involving conservation, biotechnology and the evolution of disease.</p>	<p>BIOL-201* and BIOL-205* Co-requisite: BIOL-202* or 200, or permission of the Department</p>
	<p>BIOL-441* Molecular Genetics WINTER 3 lecture, 1 seminar half-course Current research in eukaryotic molecular genetics including gene regulation, transformation, cell proliferation and the</p>	<p>BIOL-205* or BIOL-330* or MBIO-218* or -318* Gene Structure and Function</p>

	analysis of development. Specific topics will vary depending on the instructor but will include plant, insect and mammalian genetics.	
<p>Queen's University www.queensu.ca</p> <p>Offered jointly by the Departments of Biochemistry, Biology and Microbiology and Immunology</p>	<p>MBIO-218* Gene Structure and Function (Molecular Biology)</p> <p>WINTER 3 lectures, 1 tutorial; alternate weeks, half-course</p> <p>Molecular mechanisms of gene expression, biochemistry of nucleic acids, chromatin structure, DNA replication, RNA transcription; processing and translation in prokaryotic, eukaryotic and viral systems.</p>	<p>BIOL-205*</p> <p>Introduction to Mendelian and Molecular Genetics</p>
<p>Department of Biochemistry</p>	<p>BCHM-411* Advanced Molecular Biology</p> <p>WINTER 3 lectures/tutorials half-course</p> <p>This course concentrates on the molecular biology of mammalian models particularly mechanisms involved in human diseases. The human genome project, forensic analysis, DNA diagnostics of human diseases, models of transcriptional and growth regulation and cancer, DNA repair, RNA processing and translation are all discussed. Emphasis on recent findings and course materials will be drawn from current reviews.</p>	<p>MBIO 218* (or MBIO 318*) and either BCHM 310, or BCHM 315* and BCHM 316* and BCHM 317* for BCHM students; BCHM 310, or BCHM 315* and BCHM 316* for LISC students; BMCO students contact Department</p>
<p>The Michener Institute www.michener.ca</p>	<p>GE611 Intermediate Genetics: Concepts and Technology for Medical Professionals</p> <p>This four-lesson problem-based correspondence course covers a number of important topics.</p> <ul style="list-style-type: none"> • Review the genetic material • Study the life cycles of somatic and gametic cells • Discover the mechanisms of genetic disease • Investigate Mendelian genetics and its variations • Learn basic techniques for the investigation of genetic disorders • Understand genetic counselling and issues of patient care 	<p>\$349.00</p>

	<p>A tutor will help you with the course material, answer questions and mark your assignments. Four assignments; no final examination.</p> <p>Continuous Intake</p>	
<p>Trent University www.trentu.ca</p>	<p>ANTH-BIOL 344H Human Genetics 2 lecture, 1 seminar Survey of genetic principles as applied to the human being with special emphasis on clinical, populational and evolutionary genetics Offered in 2009-2010</p>	<p>9 university credits, including ANTH 240 Biological Anthropology or permission of the instructor.</p>
	<p>BIOL FRSC 205H - Introduction to Genetics FALL 2 lecture weekly, 3 lab fortnightly This course will develop a basic understanding of genetics: Mendelian inheritance, chromosome structure, genetic recombination, mutation, the structure of DNA, the nature of genes, and current topics in genetics will be investigated using examples from plants, animals, insects, bacteria, fungi and viruses.</p>	<p>Biology 103H, and one of Biology 102H or Biology 105H</p>
	<p>BIOL FRSC 362H Population Genetics WINTER 2 lecture, 3 lab This course introduces students to microevolutionary processes. A study of sources of genetic variation, genetic composition of populations and forces that determine and change that composition. Laboratory component will be in the form of group projects on population genetics of <i>Drosophila</i> or <i>Daphnia</i>.</p>	<p>7.5 university credits including Biology 205H Introduction to Genetics</p>
<p>University of Guelph www.uoguelph.ca/ Dept. of Molecular and Cellular Biology (MCB)</p>	<p>MBG*2000 Introductory Genetics WINTER, SPRING, FALL 3 lecture, 1 lab half-course Fundamental aspects of genetics including the chromosomal basis of inheritance, cytogenetics, genes in populations and quantitative traits will be introduced. Additional topics include extranuclear inheritance, human genetics and bacterial</p>	<p>4 credits including BIOL *1040</p>

	genetics. The molecular nature of the gene and general mechanisms of gene and general mechanisms of gene expression will be introduced but not covered in detail.	
University of Guelph www.uoguelph.ca/ Dept. of MCB	MBG*2020 Introductory Molecular Biology FALL, WINTER 3 lecture, 1 lab half-course This course provides an introduction to the structure of the gene and the relationship between genes and proteins with an in depth discussion of the processes of replication, transcription, translation, regulation of gene expression, mutation and DNA repair and recombination. The experimental techniques used in molecular cloning and their applications to the biotechnology industry and the study of diseases will be discussed.	BIOC*2580 Introductory Biochemistry and MBG*2000 Introductory Genetics
Dept. of Integrative Biology	MBG*3000 Population Genetics FALL 3 lecture, 2 lab half-course This course is designed to explore the concepts of random mating, inbreeding, random drift, assortative mating and selection as they relate to natural populations. The dynamic genetic structure of populations and its relationship to the process of speciation is examined. The role and significance of molecular genetics as it relates to population genetics, evolution, systematics and phylogeny is also considered.	MBG*2000 Introductory Genetics
Dept. of MCB	MBG*3050 Human Genetics WINTER 3 lecture, 3 lab half-course A course designed to introduce the student to the study of biological inheritance in humans. The course includes discussion of the genetic basis of human individual differences, gene frequencies in human populations, human behavioral genetics and developmental genetics, medical genetics and other aspects of human heredity.	MBG*2020 Introductory Molecular Genetics
Dept. of Animal and Poultry Science	MBG*3060 Quantitative Genetics WINTER 3 lecture, 2 lab half-course The nature of Mendelian inheritance when extended to quantitative traits that are jointly	MBG*2000 Introductory Genetics and half credit in Statistics

	<p>influenced by the environment and the simultaneous segregation of many genes. Prediction of response to natural and artificial selection in populations.</p>	
<p>University of Guelph www.uoguelph.ca/ Dept. of MCB</p>	<p>MBG *3200 Genetics: Our Uncertain Heritage FALL 3 lecture half-course An examination of the ethical, social and political issues arising from genetic manipulation, reproductive intervention and biotechnology through the joint application of principles of modern genetics and moral philosophy. Topics include eugenics, cloning surrogate parenting, abortion, gene therapy, DNA fingerprinting and genetic diagnosis. Related issues such as scientific freedom, access to genetic information and public policy are also considered.</p>	<p>MBG*2000 Introductory Genetics</p>
<p>Dept. of MCB</p>	<p>MBG *4040 (or *4070 – Lecture portion only) Genetics and Molecular Biology of Development FALL 3 lecture, 2 lab half-course An examination of the genetic mechanisms, which specify organismic development. Molecular biology of determination and cell differentiation, homeotic genes, oncogenes, genetic control of morphogenesis and pattern formation. Application of embryo manipulation techniques in basic science and medicine. Offered in odd-numbered years; i.e. will be offered in 2009, but not in 2010</p>	<p>MBG*2020 Introductory Molecular Biology</p>
<p>www.uoguelph.ca/ Dept. of MCB</p>	<p>MBG *4080 Molecular Genetics FALL 3 lecture half-course The chemical nature of genetic material, transcription and the control of gene expression. DNA cloning and the use of recombinant DNA molecules in modifying gene expression.</p>	<p>MBG*2020 Introductory Molecular Biology</p>
<p>Dept. of MCB</p>	<p>MBG *4240 Applied Molecular Genetics WINTER 3 lecture half-course Molecular and cellular aspects of</p>	<p>MBG*2020 Introductory Molecular Biology</p>

	<p>biotechnology. In vitro manipulations of animal and plant cells. Genetic engineering in eukaryotes and development of transgenic organisms. Methods of gene therapy and molecular biology of cancer and its treatment.</p>	
<p>University of Guelph www.uoguelph.ca/ Dept. of MCB</p>	<p>MBG *4270 DNA Replication, Recombination and Repair WINTER 3 lecture half-course DNA transactions that determine the structure of the function of the genome, with an emphasis on natural and synthetic mutagens and their mode of action; replication and recombination of genetic material; recognition and repair of DNA damage; developmentally regulated changes in gene structure; inherited and somatic genetic diseases arising from abnormal DNA metabolism; and DNA sequence changes and chromosome alterations in evolution.</p>	<p>MBG *2020 Introductory Molecular Biology</p>
<p>Dept. of MCB</p>	<p>MCB*4050 Protein and Nucleic Acid Structure FALL 3 lecture half-course This course explores the physical conformation and atomic structures of proteins and nucleic acids and the techniques and tools for the determination, comparison, and prediction of macromolecular structures. Students will design their own protein structures as part of experiencing the process of scientific writing, peer-review and publishing.</p>	<p>BIOC *3560 Structure and Function in Biochemistry</p>
<p>Dept. of MCB</p>	<p>MCB*4010 Advanced Cell Biology WINTER 3 lecture half-course This course examines the cellular and molecular biology of signal transduction. The major theme is an understanding of how eukaryotic cells receive, transmit and respond to environmental signals. Topics will include cellular regulation of cell cycle progression and cell death as well as the consequences of deregulated signal transduction in terms of</p>	<p>MBG*2020 Introductory Molecular Biology, MCB*2210 Introductory Cell Biology</p>

	disease, primarily cancer.	
University of Ottawa www.uottawa.ca/	BIO 2133 Genetics 3 lecture 2 lab Introduction to Mendel's laws of inheritance; application of Medelian analysis to problems of genetics including: gene mapping and linkage; molecular genetics; bacterial genetics and population genetics. Lab session includes experiments to illustrate genetic principles, tutorial, and problem sessions.	BIO 1130 Introduction to Organismal Biology
	BIO 3170 Molecular Biology 3 lecture Gene structure, action and replication, cellular regulation, allosteric properties of proteins, molecular basis of membrane function and the control of cell growth. Cannot be combined for credits with BCH 3170.	Prerequisite: BIO 2133, and BCH 2333
	BIO 4115 Molecular Genetics 3 lecture Investigation of gene structure, expression and evolution, including the influences of processes such as DNA transposition and rearrangement; RNA processing and splicing.	BIO 3170 or BCH 3170 Molecular Biology
	BIO 3119 Population Genetics 3 lecture (formerly BIO 4139) Combination of observation and theory to understand the genetic changes that occur both within and between populations. Extension of these single- and few-gene approaches to characterize the evolution of traits that are influenced by multiple genetic and environmental factors.	BIO 2133 Genetics
University of Toronto www.artsci.utoronto.ca	MGY311Y1 Molecular Biology 72 lectures DNA replication, DNA repair and mutation, recombination, transcription, RNA modification and processing, the genetic code and tRNA, translation, regulation of gene expression, development and differentiation,	BIO250Y1 Cell and Molecular Biology and BCH 242Y1 Biochemistry

	and molecular evolution.	
University of Toronto www.artsci.utoronto.ca	MGY312H1 Principles of Genetic Analysis 78 lab Laboratory experiments in genetics of selected organisms. Topics include Mendelian genetics, linkage and recombination, complementation, analysis of chromosome rearrangements, mutant selection and analysis in plants and bacteria, and genetic crosses with plants, bacteria, and bacteriophages.	BIO250Y1 Cell and Molecular Biology, BIO260H1 Genetics Co-requisite: MGY311Y1 Molecular Biology / BCH311H1 / CSB349H1
	MGY420H1 Regulation of Gene Expression 24 lectures This course describes regulatory mechanisms controlling gene expression in prokaryotes and eukaryotes. The lectures are designed to promote discussion of various experimental approaches. Topics include: assembly of a transcription complex; initiation of transcription; role of sigma factors and transcription factors; role of regulators of transcription; regulation of SV40 transcription; lambda antitermination; antitermination in HIV-1.	MGY311Y1 Molecular Biology and BCH340H1 Proteins: From Structure to Proteomics
	MGY470H1 Human and Molecular Genetics 24 lectures Current aspects of human and molecular genetics including: chromosome structure and function, inheritance of mutations and disease, the human genome and disease gene mapping, cancer genetics, mouse disease models and gene based diagnostics and therapies.	MGY311Y1 Molecular Biology (Note: BCH311H1 / CSB349H1 are acceptable prerequisites only by permission of the instructor)
	BIO 255Y1 Cell and Molecular Biology with Advanced Laboratory (formerly 250Y1) 52 lecture, 36 lab An introduction to the structure and function of cells at the molecular level: key cellular macromolecules; transfer of genetic information; cell structure and function; cellular movement and division. The Enhanced Laboratory	BIO150Y1 and CHM (138H1, 139H1)/151Y1, GPA 3.0. BCH 210H1 Intro Biochemistry recommended

	provides the opportunity for greater laboratory skill development in modern investigative techniques and is intended for students interested in conducting their own laboratory research.	
University of Toronto www.artsci.utoronto.ca	BIO260H1 Concepts in Genetics 36 lecture, 12 tutorial This is a problem-based course, which discusses classical, molecular, developmental, and population genetics and genomics with emphasis on model organisms for genetic analysis.	Prerequisite: BIO240H1 Molecular Biology Co-requisite: BIO241H1 Cell and Developmental Biology/ BIO255Y1 Cell and Molecular Biology
	HMB201H1 Introduction to Genes, Genetics, and Biotechnology 24 lecture, 12 tutorial Interdisciplinary course consisting of three parts: the genetic basis, tools and techniques of biotechnology; medical, environmental and agricultural applications; and ethical, legal and social aspects of biotechnology (including approaches to risk assessment, reduction and acceptance). A prime example used in the third part is the controversy over genetically modified food.	Prerequisite: BIO150Y1 Organisms in their Environment Pre- or Co-requisite: BIO240H1 Molecular Biology, BIO241H1 Cell and Developmental Biology/ BIO250Y1 Cell and Molecular Biology, BIO255Y1 Cell and Molecular Biology
	CSB349H1 Eukaryotic Gene Expression (formerly BIO349H1) 28 lecture, 18 tutorial Genome structure and the regulation of gene expression in eukaryotic cells. Topics include gene duplication, repetitive DNA, transcription, RNA interference and expression profiling. Tutorials emphasize problem based learning exercises that relate to recent advances in the broad field of eukaryotic gene expression.	BIO240H1 Molecular Biology, BIO241H1 Cell and Developmental Biology/BIO250Y1/255Y1 Cell and Molecular Biology, BIO260H1/ HMB265H1 Recommended preparation: BCH210H1/320Y1
University of Waterloo biology.uwaterloo.ca	BIOL 139 Genetics Course ID: 003665 WINTER, SPRING 3 lecture, 1 tutorial, half-course Mendelian genetics. Chromosomal mechanisms in mitosis and meiosis. The origin, inheritance and adaptive significance of chromosomal changes. Nucleic acids as	

	the carriers of genetic information. Natural selection and the evolution of genetic systems.	
University of Waterloo de.uwaterloo.ca	BIOL 139 Genetics (Online Course) Available by Distance Education FALL 2009 – check with institution for Fall 2010 Mendelian genetics. Chromosomal mechanisms in mitosis and meiosis. The origin, inheritance and adaptive significance of chromosomal changes. Nucleic acids as the carriers of genetic information. Natural selection and the evolution of genetic systems. Gene expression and regulation. Recombinant DNA techniques and recent advances in medical genetics.	Some high school biology is recommended as background
University of Waterloo biology.uwaterloo.ca	BIOL 342 Molecular Biotechnology 1 Course ID: 003691 FALL, SPRING 2 lecture, 1 tutorial half-course Molecular biotechnology applies the principles of recombinant DNA technology (genetic engineering, gene cloning) to the development of commercial products. The methods of recombinant DNA technology, molecular diagnostic systems for detecting diseases and transgenic organisms will be discussed.	BIOL 140 Fundamentals of Microbiology, and BIOL 208 Analytical Methods in Molecular Biology or BIOL 330 Molecular Biology Recommended prerequisite: BIOL 241 Introduction to Applied Microbiology
	BIOL 432 Molecular Biotechnology 2 Course ID: 003720 WINTER 3 lecture half-course How recombinant DNA technology is used to produce vaccines, plant growth promoting bacteria, pharmaceuticals, crop plants and other commercial products will be discussed.	BIOL 342 Molecular Biotechnology 1
	BIOL 434 Human Molecular Genetics Course ID: 003722 FALL 3 lecture, 3 seminar half-course Recent advances in human molecular genetics will be examined with emphasis on how human disease-causing genes are mapped, identified, isolated and characterized. Examples will draw from research on	BIOL 208 or BIOL 330 and BIOL 308 or BIOL 330

	Duchenne muscular dystrophy, Huntington disease, cystic fibrosis, Alzheimer disease, cancer, vision defects and other disorders.	
University of Western Ontario www.uwo.ca	Biology 2581B Genetics WINTER 2 lecture and 1 lecture/tutorial half-course The structure, transmission and expression of genetic elements in prokaryotic and eukaryotic organisms and populations.	A minimum grade of 60% in Biology 1222 or 1223 General or Intro to Biology, and 2280A Biochemistry and Molecular Biology
	Biology 2382B Cell Biology WINTER 2 lecture, 1 tutorial half-course Molecular and structural organization of cells in relation to function. Composition and dynamics of the plasma membrane and membrane-bound compartments in cells. Cytoskeleton and cell motility. Membrane receptors in signal and energy transduction, cell-cell adhesion and recognition. Excitable membranes.	BIO 1222 or 1223 General or Intro to Biology, CHEM 1050 or former 022 and 023 General Chemistry. Biochemistry 2280A Biochemistry and Molecular Biology should be taken first
	Biology 3466B Evolutionary Genetics WINTER 2 lecture, 3 lab 1 half-course The study of evolution in large and small random and non-random mating populations, showing discrete and quantitative inheritance. The roles and importance of mutation, inbreeding, drift, selection and linkage.	One of Biology 2244A/B, Statistical Sciences 2035, 2122A/B, 2141A/B, Psychology 2810; Biology 2581b; or permission of Biology Dept. Biology 2486A is recommended.
	Biology 3592A Principles of Human Genetics FALL 2 lecture, 1 lecture/1 tutorial half-course Genetic principles and their application to humans. Special attention will be directed to the genetic variation in our species, mutations, mechanisms of gene expression and mapping the human genome.	Biochemistry 2280A Biochemistry and Molecular Biology, and Biology 2581B Genetics
	Biology 3593B Genetic Engineering WINTER 2 lecture, 1 lecture/tutorial half-course An accounting of the principles in Genetics that have led to advances in animal and plant	Biochemistry 2280A Biochemistry and Molecular Biology, Biology 2581B Genetics

	breeding earlier in this century; recombinant DNA and other technologies employed in contemporary biotechnology; and the basis for continued progress in genetic engineering.	
University of Western Ontario www.uwo.ca	Biology 3597A/B Regulation of Gene Expression FALL/WINTER 2 lecture, 1 lecture/tutorial half-course A discussion of the genetic material and molecular mechanisms governing its expression in a variety of organisms. Offered in 2009-2010	Biochemistry 2280A Biochemistry and Molecular Biology, Biology 2581B Genetics
	Biology 4540G Developmental Genetics WINTER 2 lecture, 3 lab half-course A comparative analysis of genetics principles underlying axial patterning, sex determination, epigenetic phenomena and other developmental pathways in a select group of model organisms.	Either Biology 3338A or the former Biology 390a or permission of the Department of Biology.
	Biology Human Molecular Genetics WINTER 2 lecture, half-course This course will offer an up-to-date examination of the current status of human genetics with emphasis on the molecular information. The specific course content is expected to change from year to year reflecting research progress, including the human genome project.	Biology 3592A and 3596A/B (or the former Biology 390a or 391b); one additional 0.5 course in Biology at the 300 level or above; and registration in year 4 of an Honours Specialization module or Honours program or a Major in Genetics offered through the Dept of Biology.
	Biology 4561F Genes and Genomes I FALL 2 lecture half-course An examination of the current concepts of organization, transmission and expression of eukaryotic genes in the context of the chromosome. Topics covered include chromatin organization and composition, genomic rearrangements, techniques for mapping genes and manipulating genomes.	Biology 3596A/B; and one of the following: Biology 3594A, 3595A, 3597B or the former Biology 390a or 391b; and one additional 0.5 course in Biology at 3000 level or above; and registration in year 4 of an Hon Specialization module or Honours program or

		a Major in Genetics offered through the Dept of Biology.
University of Western Ontario www.uwo.ca	Biology 4562B Genes and Genomes II WINTER 2 lecture, half-course An examination of our current understanding of the organization, structure and function of the genes and genomes of plants, emphasizing recent developments in plant molecular genetics involving model organisms. Topics include plant gene expression, mapping of plant genes, molecular tools for DNA transfer, and organelle genetics.	Completion of at least 1.5 biology courses at 3000 level or above; and registration in year 4 of an Honours Specialization module or Honours program or a Major in Genetics offered through the Dept of Biology; or permission of the instructor
	Biology 4582 Investigative Techniques in Genetics 4 lab hours, full course A study of the techniques currently used in the various disciplines of genetics.	A min. grade of 70% in each of Biology 3596A/B, and 1.0 course from: Biology 3466B, 3592A, 3593B, 3594A, 3595A, 3597B, the former Biology 390a, 391b; and registration in year 4 of an Honours Specialization in Genetics or the Honours Genetics program; or permission of the Genetics Undergrad Coordinator
	Biology 4943E Seminar in Genetics 3 seminar/tutorial hours, full course Topics to be chosen each year such that they integrate and augment the study of genetics as presented in other genetics courses.	A min. grade of 70% in Biology 3596 A/B; and enrolment in the final year of the Hon Specialization in Genetics or the Hon Genetic program; or by permission of the Genetics Undergrad Coordinator
University of Western Ontario	Biochemistry 2280A Biochemistry and Molecular Biology	Biology 1222 General Biology or Biology

<p>www.uwo.ca</p> <p>Dept. of Biochemistry</p>	<p>FALL 3 lecture half-course</p> <p>An introduction to biochemistry with emphasis on protein structure and function, intermediary metabolism and nucleic acid structure and function.</p>	<p>1223 Intro Biology and Chemistry 1050 or 022 and 023 Gen. Chemistry</p> <p>Recommended: a course in organic chemistry be taken previously or concurrently (e.g., Chemistry 2213A/B).</p>
<p>University of Western Ontario</p> <p>www.uwo.ca</p>	<p>Biochemistry 3381A Biological Macromolecules</p> <p>FALL 3 lecture, 1 tutorial; half-course</p> <p>A consideration of the structure of proteins and nucleic acids; enzymology; elements of recombinant DNA technology and related methodology.</p>	<p>Registration in Year 3 of a Biochemistry or Chemistry program, or Biochemistry 2280A Biochemistry and Molecular Biology and Chemistry 2213A/Band 2223B; or 2273A Organic Chemistry and Chemistry 2284B</p>
	<p>Biochemistry Molecular Biology of DNA and RNA</p> <p>FALL 2 lecture half-course</p> <p>The use of fundamental techniques in molecular biology and molecular genetics are illustrated using examples from the classic and current literature. Selected topics include eukaryotic gene and cloning, transgenic animals, rational drug design, DNA replication and cell cycle regulation.</p>	<p>Biochemistry 3381A Biological Macromolecules</p>
	<p>Biochemistry 4420B Molecular Biology of Proteins</p> <p>WINTER 2 lecture half-course</p> <p>Topics to be considered at an advanced level will include: translation, folding and assembly, targeting, turnover, structure and motifs.</p>	<p>Biochemistry 3381A Biological Macromolecules</p>
<p>University of Windsor</p> <p>www.uwindsor.ca/</p>	<p>55-211 Genetics</p> <p>3 lecture, 3 lab</p> <p>The course reviews transmission genetics and principles of inheritance. The material also</p>	<p>55-140 Biological Diversity and 55-141 Cell Biology</p>

	includes non-nuclear inheritance and gene linkage, gene expression and regulation, mechanisms and phenotypic effects of DNA mutation and repair, and the principles and applications of population and quantitative genetics. Students will be exposed to molecular genetic techniques such as PCR and DNA sequencing.	
www.uwindsor.ca/flexible	<p>03-55-212 Genetics</p> <p>Same as above. This is a Flexible Learning course designed primarily for graduates of programs in Medical Technology from a College of Applied Arts and Technology. This course may not count as a major requirement for Biology Majors.</p> <p>Distance Education Delivery Details: Print, internet, CD.</p> <p>Students Require: Computer, internet, e-mail</p> <p>Check Web site for next offering in 2010</p>	55-140 Biological Diversity and 55-141 Cell Biology, or the equivalent.
	<p>55-350 Molecular Cell Biology</p> <p>3 lecture</p> <p>An integration of recent findings in molecular and cell biology with those in biochemistry and genetics. The main focus will be on regulation of gene transcription, intracellular signalling, transport processes, and cell cycle events.</p>	55-211 Genetics and 55-213 Introductory Molecular Biology, or 55-212 and 55-203 with appropriate laboratory experience and signature of instructor
www.uwindsor.ca/flexible	<p>03-55-350 Molecular Cell Biology</p> <p>An integration of recent findings in molecular and cell biology with those in biochemistry and genetics. The main focus will be on regulation of gene transcription, intracellular signalling, transport processes, and cell cycle events.</p> <p>Distance Education Delivery Details: Print and internet</p> <p>Students Require: E-mail and Internet access</p> <p>Check Web site for next offering in 2010</p>	55-211 Genetics and 55-213 Introductory Molecular Biology
	<p>55-454 Molecular Biology of Growth and Development 3 lecture</p> <p>Analysis at the molecular level of the growth and development of prokaryotes, phages, lower eukaryotes, and their plasmids.</p>	55-350 Molecular Cell Biology

	<p>55-455 Developmental Signaling and Developmental Genetics</p> <p>3 lecture</p> <p>Analysis at the molecular level of the activation and control of genes and proteins during cogenesis and early development in lower and higher eukaryotes.</p>	55-355 Embryology or consent of course coordinator
www.uwindsor.ca/fl/exible	<p>03-65-205 Statistics for the Sciences</p> <p>FALL START Lecture- 3hrs/week Tutorial – 1hr/week Distance education</p> <p>Descriptive statistics. Probability, discrete and continuous distributions. Point and interval estimation. Hypothesis testing. Goodness-of-fit. Contingency tables.</p>	Prerequisite: Grade 12 Advanced Level Mathematics or OAC Finite Mathematics or Grade 11 Functions and Relations or Grade 11 Functions.
<p>Wilfred Laurier University</p> <p>www.wlu.ca/</p>	<p>BI223 Molecular Genetics</p> <p>FALL 3 lecture/1 tutorial Half credit</p> <p>An introduction to the molecular processes underlying transmission genetics, including bacterial genetics, gene expression, the regulation of gene expression, and including general aspects of recombinant DNA technology and applications and uses of molecular methods.</p> <p>Not offered in 2009/2010</p>	BI100 Principles and Processes of Biology, or BI102 Introduction to Biological Science and permission of the department
	<p>BI224 Genetic Analysis</p> <p>WINTER Half credit 3 lectures/1 tutorial</p> <p>An introduction to the concepts and principles of transmission (Mendelian) genetics, and population genetics, using analysis and interpretation of genetic examples and situations to illustrate how genes are inherited, the resultant phenotypes, and the effects of gene interactions. Where appropriate, interpretations will be extended to a discussion of the underlying molecular basis or genomic organization. Examples will pertain primarily to selected eukaryotic organisms, including humans.</p> <p>Not offered in 2009/2010</p>	BI223 Molecular Genetics
	<p>BI420 Topics in Advanced Genetics</p> <p>3 lecture/2 seminar full course</p>	BI223 Molecular Genetics and BI224

	<p>Control of gene expression, recombinant DNA techniques, immunogenetics, genetic control of differentiation, genetics of reproduction in higher plants, polygenetic inheritance in humans, teratology.</p> <p>Not offered in 2009/2010</p>	Genetic Analysis
<p>York University www.yorku.ca/</p>	<p>SC/BIOL2040 4.0M Genetics WINTER 3 lecture, 3 lab, one term A study of the organization and behaviour of genes and chromosomes and their roles in cells, organisms, populations and evolution.</p>	SC/BIOL 1010 6.00 Biological Science
	<p>SC/BIOL3130 3.0M Molecular Biology II: Regulation of Gene Expression WINTER 3 lecture, one term Gene structure and function. Mechanisms of gene expression in prokaryotes and eukaryotes. Storage and retrieval of genetic information; transcription, translation and their control.</p>	SC/BIOL 3110 3.00 Molecular Biology 1: Nucleic Acid Metabolism
	<p>SC/BIOL3140 4.0A/M Advanced Biochemistry and Molecular Genetics Laboratory FALL 1 lecture, 6 lab two days/week, plus additional laboratory hours throughout the week. One term Research techniques used in biochemistry and molecular biology, including recombinant DNA technology, are illustrated. Purification of a restriction endonuclease; isolation and mapping of bacterial plasmids, bacteriophage and recombinant molecules; polymerase chain reaction (PCR); nucleic acid hybridization.</p>	<p>Prerequisite or co-requisite: SC/BIOL 3110 3.00 or SC/BCHM 3110 3.00. SC/BIOL 3130 3.00 or SC/BCHM 3130 3.00 strongly recommended as a prerequisite or co-requisite.</p> <p>Limited enrolment.</p>
	<p>SC/BIOL4285 3.0M Human Molecular Genetics WINTER 3 lecture, one term The course covers the application of genetic and molecular biological techniques to study human diseases and other related areas, and discusses ethical concerns that might arise from this research.</p>	SC/BIOL 3130 3.00 Molecular Biology II: Regulation of Gene Expression