

ANAT 100/3.0 Anatomy of the Human Body

ANAT 100, Anatomy of the Human Body, is a web-based course suitable for students at all levels of post-secondary education with an interest in Human Anatomy. This foundational anatomy course is designed to introduce basic structure and functional relationships of the human body. The course entails the basic building blocks of the human body at the gross and microscopic levels. Through a series of learning modules that will include readings, group learning activities, assignments, inquiry, and a practicum that involves an interactive study using a virtual cadaver and Queen's online database of organs and tissues, students will discover and understand the functioning of various body systems. Body organ systems covered in this course will include the skeletal, muscular, nervous, endocrine, cardiovascular, respiratory, digestive, urinary and reproductive systems. Each module of this course will focus on a system, and recognizing that for the beginning anatomist there is a lot of information to assimilate, the topics are structured from the simple to the complex.

Note: Only offered online.

Learning Hours

120 (48 OA; 72 PS)

Exclusions

ANAT 101/3.0, IDIS 150/6.0

One-Way Exclusion

May not be taken with or after ANAT 215/3.0; ANAT 216/3.0; ANAT 312/3.0; ANAT 315/3.0; ANAT 316/3.0.

ANAT 270/3.0 Human Anatomy and Morphology

ANAT 270, Human Anatomy and Morphology, is designed to introduce the foundations of human structure and function to students at all levels of post-secondary education. Through a series of learning modules that will include readings, group learning activities, assignments, inquiry and a practicum that involves an interactive study using a virtual cadaver, students will discover an understanding of the architecture of the human body. This course will survey the gross and microscopic anatomy of the body organ systems including the skeletal, muscular, nervous, endocrine, cardiovascular, respiratory, digestive, urinary and reproductive systems.

Note: Only offered online.

Courses of Instruction

February 2018

Note: May not be taken for credit towards the Plan requirements of the LISC Specialization or Major Plans.

Learning Hours

120 (60O;60P)

Prerequisites

Minimum 2nd year (Level 2) standing and (PHGY 170/3.0 or BIOL 102/3.0) or permission of the instructor.

One-Way Exclusion

May not be taken with or after ANAT 215/3.0; ANAT 216/3.0; ANAT 315/3.0; ANAT 316/3.0.

BCHM 218/3.0 Molecular Biology

BCHM 218, Molecular Biology, is a foundational course to the study of molecular biology, focusing on the structural and functional properties and relationships of DNA, RNA and proteins, particularly the processes required to reliably pass genetic information from DNA to RNA to protein, and from one generation to the next. This course also examines how these processes are related to the development of human diseases and to basic biotechnology techniques and genetic engineering concepts that are critical for synthetic biological system creation and integration.

Learning Hours

120 (36L;12T;72P)

Prerequisites

Minimum 2nd year (Level 2) standing and (4U Biology and PHGY 170/3.0) or (BIOL 102/3.0 and BIOL 103/3.0), or permission of instructor.

Equivalency

MBIO 218/3.0.

Exclusions

None

BCHM 270/3.0 Biochemical Basis of Health and Disease

BCHM 270, Biochemical Basis of Health and Disease, will introduce general biochemical concepts that will allow for an understanding of the biological and chemical principles underlying human physiology, health, and disease. The course will provide self-paced learning and utilize evidence-based teaching principles, small group learning, peer-learning, and guided-independent learning methodologies to provide an inclusive learning environment. Students will gain an enhanced appreciation of general applications of biochemistry as applied in day to day healthy life and during the disease states, diagnosis and clinical management of metabolic disorders.

Note: Only offered online.

Note: This introductory biochemistry online course is intended for prospective students in Nursing, Environmental Sciences, Engineering, Commerce, and general science programs.

Note: Only offered online. May not be taken for credit towards the Plan requirements of the BCHM or LISC Specialization or Major Plans.

Learning Hours

126 (66 OA; 60 PS)

Prerequisites

Minimum 2nd year (Level 2) standing and (4U Biology and PHGY 170/3.0) or (BIOL 102/3.0 and BIOL 103/3.0), or permission of the instructor.

Exclusions

No more than 3.0 units from BCHM 102/3.0; BCHM 270/3.0.

One-Way Exclusion

May not be taken with or after BCHM 315/3.0; BCHM 310/6.0

BMED 171/3.0 Social and Physical Determinants of Health and Disease

BMED 171, Social and Physical Determinants of Health and Disease, will use evidence-based practices to address the impact of social and environmental sources on health at both an individual and population level. Students will focus how the contexts of peoples' lives affect their health, methods for measuring contextual effects, and the

role of medical systems in creating health. Students will gain skills to understand and evaluate scientific literature and become community advocates for health by researching and preparing a PSA as a cumulative assessment.

Note: Only offered online.

Learning Hours

114 (36 OA;78 PS)

Prerequisites

None

Exclusions

No more than 3.0 units from BMED 171/3.0; HLTH 101/3.0; HLTH 102/3.0; GPHY 339/3.0.

**This course is not open to Arts and Science students*

BMED 173/3.0 The History and Philosophy of Health and Healthcare

BMED 173, History and Philosophy of Health and Healthcare is a multidisciplinary course organized around five major fields of health endeavour. Starting in Module Two, a different core subject is selected from the Bachelor of Health Sciences program every other week. Each module begins with the historical evolution of the subject area, focusing on some of the people, events and discoveries that had the biggest impact on its development. Against this historical backdrop, students then move to the present to explore contemporary controversies within each field that illustrate the complex ways that social values and science interact.

Note: Only offered online.

Learning Hours

114 (36 OA;78 PS)

Prerequisites

None

Exclusions

No more than 3.0 units from BMED 173/3.0; PHIL 201/3.0

**This course is not open to Arts and Science students*

BMED 270/3.0 Fundamentals of Research Methodology

BMED 270, Fundamentals of Research Methodology, will introduce fundamentals of health-related research methods with a focus on developing critical reasoning skills. Using examples from a wide range of health-related research topics, students will gain familiarity and skills to assess primary literature at a basic level. Throughout the course students will assess various aspects of both qualitative and quantitative research such as origins of research questions, development of study rationales, sampling and participant recruitment, data quality, strengths and limitations of various study designs, internal and external validity, ethics for research involving human subjects, and introduction to knowledge translation.

Note: Only offered online

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 2nd (Level 2) year standing and STAT 263/3.0 + CORE, or permission of the instructor.

Exclusions

No more than 3.0 units from BMED 270/3.0; HLTH 252/3.0; PSYC 203/3.0; SOCY 210/3.0; GPHY 240/3.0; EPID 301/3.0.

BMED 271/3.0 Global and Population Health

In this course, emphasis will be placed on population health, instead of the health of individuals. Population and global health prioritize partnerships and resource sharing, instead of unilateral relationships, and focuses on advocacy.

Note: Only offered online

Courses of Instruction

February 2018

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 2nd year (Level 2) standing or permission of the instructor.

Exclusions

No more than 3.0 units from BMED 271/3.0; HLTH 205/3.0

BMED 370/3.0 Genetics and Genomics

An interdisciplinary course that will provide an introduction to the field of applied genomics for identifying genes underlying multifactorial traits, diseases and drug treatment outcomes. Basic principles of gene mapping studies will be covered in the context of recent advances in the field including statistical methods, high-throughput technologies and integrative analyses of biological datasets. The applications and implications of genome-wide studies will be discussed.

Note: Only offered online

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 3rd year (Level 3) standing and BCHM 270/3.0 or BCHM 218/3.0, or permission of the instructor.

Exclusions

None

BMED 373/3.0 Health Ethics, Law, and Policy

BMED 373, Health Ethics, Law, and Policy, is an introduction to ethical, legal and regulatory requirements for people working in the health professions. Many of the decisions healthcare workers make have an ethical or legal dimension. In some of these situations, knowing or doing the right thing can be unclear or difficult. In

this course, students will learn how to recognize aspects of health care that raise ethical and legal questions and will develop approaches to creatively and effectively answering these questions. Over twelve weeks, we cover ethical and legal issues encountered in most types of health care organizations, including acute care hospitals, rehabilitation hospitals, outpatient facilities, dental clinics, nursing homes, home care organizations, and health care systems. The values, principles and laws we review are also applicable to diverse client and patient populations.

Note: Only offered online.

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

(Minimum 3rd year (level 3) standing in the Bachelor of Health Sciences program + BMED 173/3.0) or (Minimum 3rd year (level 3) standing within the Life Science or Biochemistry program) or permission of the instructor.

Exclusions

No more than 3.0 units from BMED 373/3.0; PHIL 301/3.0; PHIL 157/3.0.

BMED 380/3.0 Evolutionary Biology of Cancer

BMED 380, Evolutionary Biology of Cancer is a third-year online course designed to introduce students from various biological sciences and allied health backgrounds to cancer as an evolutionary problem. The course focuses on the effect of the local tumour environment on the progression of cancer and uniquely emphasizes the impact of the immune system in fighting cancer while at the same time shaping tumour cell evolution. In addition, the course will cover the effect on malignant progression of other factors present in the tumour environment, such as oxygenation levels.

Note: Only offered online.

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 3rd year (Level 3) standing and one of MICR 270/3.0 (prerequisite) or MICR 360/3.0 (corequisite); or Minimum 3rd year standing in the BHSc(H) program + one of BCHM 270 or BCHM 218 or permission of the instructor; or permission of the instructor.

Exclusions

None

BMED 381/3.0 Clinical and Diagnostic Chemistry

BMED 381, Clinical and Diagnostic Chemistry, covers a branch of laboratory medicine and explores the role of the laboratory in the diagnosis of disease. It describes molecules and macromolecules of biological importance and explains different chemical processes and metabolic pathways in the human body. The course focuses on interpretation of clinical and laboratory data with respect to diagnosis of different diseases.

Note: Only offered online.

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 3rd year (Level 3) standing and ANAT 100/3.0 and PHGY 170/3.0 and BCHM 270/3.0, or permission of the instructor

Exclusions

None

BMED 383/3.0 Advanced Research Methodologies

BMED 383, Advanced Research Methodologies, will provide students with the opportunity to build a mixed methods research design around questions of personal interest. The course instruction will assist students as they navigate processes of literature review, question development, experimental design, proposed approaches

to data analyses (both quantitative and qualitative), and proposed methods of knowledge mobilization.

Note: Only offered online

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 3rd year (Level 3) standing + (BMED 270/3.0 or HLTH 252/3.0 or PSYC 203/3.0 or SOCY 210/3.0) or permission of the instructor.

Exclusions

None

BMED 384/3.0 Integrated Laboratory Studies

This course will be a two-week intensive multidisciplinary laboratory course conducted in-person on the Queen's University Campus. Students will participate in a variety of laboratories, including in the disciplines of physiology, pharmacology, anatomy, microbiology, and biochemistry. Students will learn a number of different laboratory techniques, developing skills in scientific methodology, data acquisition and interpretation. Students will also attain skills in critical thinking and hypothesis development, as well as gain experience in writing laboratory reports, anatomy bell-ringers, presenting their results in posters, debates and in oral presentations.

Learning Hours

120 (60 hours/week).

Prerequisites

Minimum 3rd year (Level 3) standing and ANAT 100/3.0 PHGY 170/3.0; MICR 271 or MICR 270; PHAR 270/3.0; BCHM 218 or BCHM 270; or permission of the instructor.

Exclusions

LISC 391/3.0

BMED 470/3.0 Principles of 'Omics'

This course will build on information learned in BMED 370 as well as explore the integration of genomics with other omics such as transcriptomics, epigenomics, proteomics and metabolomics data in the study of mechanisms controlling biological processes and disease risk. This course will cover technological advances in omics data collection, computer systems for management and processing, as well methods for the integrative analysis of large-scale omics data in biomedical research.

Note: Only offered online

Learning Hours

114 (36O; 78P)

Prerequisites

Minimum 4th year (Level 4) standing and BMED 370/3.0 or permission of the instructor

Exclusions

None

BMED 471/3.0 Advanced Global and Population Health

Students will take knowledge gained from BMED 271, and apply it in this course, which will focus on more advanced topics of population and global health, as well as provide experiential learning.

Note: Only offered online

Learning Hours

114 (24 OA; 24 OCA; 66 P)

Prerequisites

Minimum 4th year (Level 4) standing and BMED 271/3.0, or permission of instructor

Exclusions

No more than 3.0 units from BMED 471/3.0; HLTH 415/3.0.

BMED 472/3.0 Special Populations: Neonatal to end-of-life care

In this online course, students will examine how variations in determinants of health can effect delivery of health care to special populations and shape health policy. Specific populations covered will include neonates, marginalized populations, those in intensive and end-of-life palliative care.

Note: Only offered online

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 4th year (Level 4) standing and BMED 173/3.0 and BMED 373/3.0, or permission of instructor

Exclusions

None

BMED 473/3.0 Developmental Origins of Health and Disease

This course will cover how the early-life environment contributes to later-life health. Specifically, students will learn about how prenatal, neonatal, and early childhood exposures and environments contribute to health and disease later in life, including the development of numerous non-communicable diseases affecting numerous organ systems. Mechanisms of how these exposures are thought to contribute to the development of these diseases will also be discussed.

Note: Only offered online

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 4th year (Level 4) standing and BMED 372/3.0, or permission of the instructor

Exclusions

None

BMED 482/3.0 Proteomics and Metabolomics

'Omics' technologies allow the components of a living organism to be appreciated in their entirety by providing insight into gene expression, protein synthesis and function and metabolic networking. This course builds upon concepts presented in BMED 370 Fundamentals of Genomics by covering the basic principles of proteomics and metabolomics and their application in the new systems biology 'omics' approach to scientific discovery.

Note: Only offered online

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

BHSc Students: Minimum 4th year (Level 4) standing, BCHM218/3.0, BCHM 270/3.0 and BMED 370/3.0, or permission from the Instructor. Non-BHSc Students: BCHM 315/3.0 and BCHM 316/3.0 or BCHM 310/9.0, or permission of the instructor.

Exclusions

None

BMED 483/3.0 Advanced Topics in Infectious Diseases

This course will examine basic principles of infectious diseases such as pathophysiology, epidemiology and transmission, and control of infectious agents including an emphasis on antimicrobial therapy and resistance. Selected infectious disease syndromes will be examined to explore unique host microbe interactions. Students will work through the topics online using interactive multimedia modules. Student assessment will include weekly online quizzes, group and individual assignments. Active participation will also form part of student assessment. At the completion of the course, students will have an understanding of the key concepts of emerging topics in infectious diseases.

Note: Only offered online

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 4th year (Level 4) standing and MICR 382/3.0, or permission from the Instructor.

Exclusions

None

CRSS 454/3.0 Cardiovascular Sciences

A study of the physiology, pharmacology and anatomy of the cardiovascular system. Topics include integrative mechanisms and pharmacotherapy involved in short-term and long-term control of the circulation in health and disease.

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 4th year (Level 4) standing and PHGY 210/6.0 and PHAR 270/3.0, or permission from the instructor.

Exclusions

None

IDIS 280/3.0 Interprofessional Approaches in Healthcare

This course aims to prepare learners with the knowledge and capabilities for working within complex interprofessional environments as common in the healthcare sector. These capabilities are referred to as 'interprofessional competencies', as developed by healthcare experts and leaders in Canada, and described in The National Interprofessional Competency Framework. The six competencies are: patient/client/family/community-centred care, interprofessional communication, role clarification, team functioning, interprofessional conflict resolution and collaborative leadership. These competencies can be mapped to CanMEDS roles and comparable health

discipline competencies. The course is designed as a series of modules, introducing the basics of collaborative practice in healthcare and the six interprofessional competencies, culminating in the application of knowledge to authentic patient scenarios and effective collaborative teamwork.

Note: Only offered online.

Learning Hours

96 (36 OA;60 PS)

Prerequisites

Minimum 2nd year (Level 2) standing or permission of the instructor.

Exclusions

None.

MICR 270/3.0 Infection, Immunity, and Inflammation

MICR 270, Infection, Immunity and Inflammation, is designed for students from various biological sciences and allied health backgrounds at all levels of post-secondary education and is recommended as a foundation course for students pursuing a career in the health sciences. This course focuses on the biology of the immune system in combating infections caused by common pathogens as well as major global infectious disease threats. The unique features of this course lie in its approach of understanding body's defense mechanisms in combating microbial, autoimmune, immune mediated diseases and cancer. By the end of the course the student will be able to apply the knowledge gained through this course in various areas of life sciences.

Note: Only offered online.

Learning Hours

114 (36 OA;78 PS)

Prerequisites

Minimum 2nd year (Level 2) standing + 4U Biology recommended and (PHGY 170/3.0) or (BIOL 102/3.0) or (MICR 121/3.0) or permission of the instructor.

One-Way Exclusion

May not be taken with or after MICR 360/3.0.

MICR 271/3.0 Introduction to Microbiology

Microbes make up a large component of the earth's total biomass. In addition to pathogens causing significant infectious diseases, a healthy human being carries around approximately 100 trillion "good" bacteria, as well as other microbes. MICR271 provides an introduction to the biology of prokaryotic and eukaryotic microbes, including pathogenic and beneficial bacteria, viruses, fungi, helminthes, and protozoa. An overview of the biological features of these microorganisms and their component parts will highlight their roles in public health and the environment.

Note: Only offered online; if taking the Infection, Immunity, Inflammation sub-plan, must take both MICR270 and MICR271, otherwise students may take one or the other.

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 2nd year (Level 2) standing and PHGY 170.

Exclusions

No more than 3.0 units from MICR 271/3.0; MICR 221/3.0.

MICR 382/3.0 Microbes in Health and Disease

MICR 382, Microbes in Health and Disease will examine the ongoing interplay between microbes and humans, focusing on the roles of microbes in health and disease. It wasn't until the late nineteenth century that diseases such as plague, typhoid fever, malaria, and influenza were understood to be caused by microbes. These diseases occur despite the unique relationship developed over millions of years between microbes and humans that constitutes the immune system. In addition, humans act as hosts to trillions of beneficial microbes that thrive in and on our bodies. Infectious diseases result from microbes found both in the environment and associated with the human body.

Note: Only offered online.

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 3rd year (Level 3) standing and MICR 271/3.0, or permission of instructor

Exclusions

None.

NSCI 483/3.0 Advances in Neuroscience

This course will introduce the human nervous system at an advanced level with an emphasis on the brain systems supporting behaviour and cognition. The underlying anatomy, physiology and pharmacology of these systems will be discussed.

Note: Only offered online

Learning Hours

114 (36O; 78P)

Prerequisites

Minimum 4th year (Level 4) standing and PHGY 210/6.0; or permission of the instructor

Exclusions

None

PHAR 100/3.0 Introductory Pharmacology

PHAR 100, Introductory Pharmacology, is designed as a general interest course that introduces the subjects of pharmacology and toxicology, with emphasis on common drugs used and abused by society. Pharmacology is broadly defined as the effect of drugs and chemicals on living organisms, while toxicology is the study of the deleterious effects of drugs and chemicals on living organisms. No prior knowledge of physiology is required to understand the drug action described in this course. This 12-week course consists of six modules, which student will work through online. Students will participate in two activities throughout the course that will encourage

communication and teamwork, as well as ensure concepts have been understood and can be applied to real life scenarios. In addition, students will be required to submit one individual assignment, answering assigned questions about the course material. At the end of the course, students will have a basic understanding of pharmacology and toxicology.

Note: Only offered online.

Learning Hours

120 (36O; 84P)

Recommendation

4U Biology.

Exclusions

None.

One-Way Exclusion

May not be taken with or after: PHAR 230/3.0; PHAR 270; PHAR 340/3.0; PHAR 450/3.0.

PHAR 270/3.0 Fundamentals of Pharmacology, Toxicology, and Therapeutics

PHAR 270, Fundamentals of Pharmacology and Therapeutics, is an interdisciplinary course that introduces the basic principles and clinical applications of pharmacology. This 12-week course covers six themes or topics. Students will work through the topics online, using a combination of online modules, readings, and short video clips. Students will participate in a variety of assessments throughout the course that will encourage communication and teamwork, as well as ensure concepts have been understood and can be applied to real life scenarios. At the end of the course, students will have a thorough understanding of the fundamentals of pharmacology and therapeutics.

Note: Only offered online.

Note: Not available to BNSc students.

Note: May not be taken for credit towards the Plan requirements of the LISC Specialization Plans.

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 2nd year (Level 2) standing and (PHAR 100/3.0 and PHGY 170);

OR Corequisites one of PHGY 210/6.0, PHGY214; KNPE225; KINE225;

OR permission of the instructor.

Exclusions

No more than 3.0 units from PHAR 230/3.0; PHAR 270/3.0; PHAR 340.

One-Way Exclusion

May not be taken with or after PHAR 450/3.0.

PHAR 380/3.0 Drug and Environmental Toxicology

This course will explore the human toxicology associated with both pharmaceutical and environmental exposures. Topics will include metabolism and mechanisms of toxicity of various pharmaceuticals and environmental pollutants. Toxicological effects of specific classes of environmental toxicants and different groups of pharmaceuticals will also be discussed.

Note: Only offered online

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 3rd year (Level 3) standing and PHAR 270/3.0 or permission of the instructor

Exclusions

PHAR 416/3.0

PHAR 480/3.0 Drug Discovery and Development

This survey course covers the life-cycle of a pharmacologic product, from drug discovery to its development, as well as the social and economic pressures exerted upon the pharmaceutical industry. Topics include target identification, design and synthesis, in vitro and in vivo efficacy determination, biochemical and biological optimization, preclinical safety assessment, clinical trials, and generics and over-the-counter medications.

Note: Only offered online

Note: May not be taken for credit towards the Plan requirements of the LISC Specialization Plans.

Learning Hours

120 (40 OA; 80 PS)

Prerequisites/Corequisites

Minimum 4th year (Level 4) standing and one of (PHAR 270/3.0 or PHAR 340/3.0) and one of (PHAR 380/3.0 or PHAR 416/3.0) or equivalent, or permission of the instructor.

Exclusions

DDHT 459/3.0; DDHT 460/3.0

PHGY 170/3.0 Human Cell Physiology

PHGY 170 Human Cell Physiology is an introductory level course on the structure and function of human cells for students interested in pursuing human health-related disciplines. Students will also learn the principles of energy metabolism, cell growth and proliferation, and how cells interact with their environment. The course then integrates the concepts of cell physiology with that of tissues, organs, and systems.

Note: Only offered online.

Learning Hours

120 (60 OA; 60 PS)

Prerequisites

4U Biology recommended

One-Way Exclusion

May not be taken with or after KNPE 225/3.0.

PHGY 210/6.0 Physiology for Health Sciences

The function of organs, body systems and the integration of functions in the whole body.

Note: Only offered online.

Learning Hours

300 (3000)

Prerequisites

Minimum 2nd year (Level 2) standing and a GPA of 2.0 in BIOL 102/3.0 and BIO L103/3.0 or PHGY 170/3.0 or permission of the instructor.

Exclusions

No more than 6.0 units from IDIS 150/6.0; KNPE 125/3.0; KNPE 225/3.0; PHGY 210/6.0; PHGY 212/6.0; PHGY 214/6.0.

PHGY 370/3.0 Pathophysiology

PHGY 370, Pathophysiology is an introductory course in which the underlying functional changes of cells and physiological systems will be discussed in association with a variety of disease processes. This course builds on the knowledge and concepts learned in prerequisite physiology courses and uses that foundation to understand how human disease disrupts the function of the major systems of the body, and to a lesser degree, how it is diagnosed and treated.

Note: Only offered online.

Learning Hours

114 (36 OA; 78 PS)

Prerequisites

Minimum 3rd year (Level 3) standing and ANAT100/3.0 and one of PHGY 170; IDIS 150; PHGY 210; PHGY 214 or permission of the instructor.

Exclusions

No more than 3.0 units from PHGY 370/3.0; PHGY 350/3.0