# 11.8 Human Biosciences

[www.mun.ca/humanbiosciences](http://www.mun.ca/humanbiosciences)

How do food, drugs and the environment impact your health? That is the central question of the Human Biosciences program. Introductory courses provide the necessary background in an interdisciplinary manner with each course blending concepts from biochemistry, nutrition, pharmacology, and toxicology. Students may tailor their program to their own interests through diverse electives leading to one of our pre-defined sub-specialties (Human Biosciences [Biochemistry], Human Biosciences [Nutrition], Human Biosciences [Health and Disease], Human Biosciences [Gene Regulation]), or a student-defined general Human Biosciences degree. Honours degree options involve completion of a research project that may focus on either laboratory-based research, a literature-based systematic/scoping review, education/outreach, or entrepreneurship/business projects, depending on student interests and career goals.

The following undergraduate programs are available and are administered by the Department of Biochemistry:

1. [Major or Honours in Human Biosciences](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#d.en.324389)
2. [Cell Biology and Human Biosciences Joint Honours](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/10/2/#d.en.324425)
3. [Chemistry and Human Biosciences Joint Honours](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/10/2/#d.en.324426)
4. [Human Biosciences and Physics Joint Honours](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/10/2/#d.en.324428)
5. [Human Biosciences and Psychology (Behavioural Neuroscience) Joint Honours](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/10/2/#d.en.324429)
6. [Minor in Human Biosciences](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#d.en.324400)

Students who wish to enroll in any of these programs should plan their program well in advance so that they will have taken the appropriate prerequisites. Students are advised to consult with the Department Academic Advisor at the earliest opportunity.

For the general and honours degrees in the programs above, students should refer to the Faculty of Science [Degree Regulations](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/4/) for the [General](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/4/2/#d.en.304726) and [Honours](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/4/2/#d.en.304727) degrees of Bachelor of Science. For a Minor in Human Biosciences, students should refer to [Degree Regulations, Minor Programs in the Faculty of Science](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/4/7/). All students are strongly advised to review the Faculty of Science [Graduation Requirements](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/4/8/) and in particular, the requirements for [Academic Standing](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/4/8/#d.en.304721).

Human Biosciences course descriptions are found at the end of the Faculty of Science section under Course Descriptions, [Human Biosciences](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/).

Students are encouraged to choose a minor.

#### [11.8.1 Admission to Programs in Human Biosciences](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#11.8.1)

Students seeking admission to any Human Biosciences program should apply no later than May 31 to ensure the application is processed before registration opens for the next academic year. Failure to apply before May 31 may result in the inability to register for required courses. Eligibility for scholarships and awards in Human Biosciences may also be affected.

#### [11.8.1.1 Admission to the Major in Human Biosciences](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#11.8.1.1)

Entry to the Human Biosciences Major program is based on academic standing.

1. To be considered for admission to the program students must have at least 24 credit hours in courses and have successfully completed the following courses (or their equivalents) with a minimum overall average of 60%. In addition, students must be eligible for entry to Chemistry 2400.
   1. Six credit hours in [Critical Reading and Writing (CRW)](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-humanities-and-social-sciences/6/1/#d.en.307242) courses, including at least 3 credit hours in English courses.
   2. Chemistry 1050 and 1051 (or 1200 and 1001).
   3. Mathematics 1000.
   4. Biology 1001.
   5. Biology 1002 or Human Biosciences 1001 (or Biochemistry 1600).

Note: Students who have appropriate high school equivalent courses may be admitted directly into the Human Biosciences major.

#### [11.8.1.2 Admission to the Honours Degree in Human Biosciences](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#11.8.1.2)

Students normally should apply for an Honours program during their third year of studies. To be eligible for admission, students must be in Honours standing as per [Academic Standing](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/4/8/#d.en.304721) in the [Degree Regulations](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/4/) for the Honours Degree of Bachelor of Science.

#### [11.8.2 Regulations for Programs in Human Biosciences](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#11.8.2)

#### [11.8.2.1 Major in Human Biosciences](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#11.8.2.1)

1. Required courses to complete the major:
   1. Six credit hours in [Critical Reading and Writing (CRW)](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-humanities-and-social-sciences/6/1/#d.en.307242) courses, including at least 3 credit hours in English courses.
   2. Biology [1001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/); Biology [1002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) or Human Biosciences [1001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [1600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)); Mathematics [1000](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or equivalent), Statistics [2550](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or equivalent); Chemistry [1050](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [1051](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Chemistry [1200](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) and [1001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)).
   3. Human Biosciences [2001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or the former Biochemistry 2101 or Biochemistry [2201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)), [2002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [2600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)), [2003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [3206](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) or [3106](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)), [2004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [2100](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) or [2200](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)), [2901](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [2901](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)), [3001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3005](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3906](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [3906](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)), [3907](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [3907](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)).
   4. Human Biosciences [4800](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/).
   5. At least six further credit hours from Human Biosciences courses at the 4000-level.
   6. Medicine [310A/B](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/).
   7. Chemistry [2400](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/).
   8. A sufficient number of elective courses to bring the total Science courses up to at least 78 credit hours and the degree total up to 120 credit hours.

#### [11.8.2.2 Honours Degree in Human Biosciences](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#11.8.2.2)

1. Required courses:
   1. Six credit hours in [Critical Reading and Writing (CRW)](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-humanities-and-social-sciences/6/1/#d.en.307242) courses, including at least 3 credit hours in English courses.
   2. Biology [1001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/); Biology [1002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) or Human Biosciences [1001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [1600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)); Mathematics [1000](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or equivalent), Statistics [2550](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or equivalent); Chemistry [1050](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [1051](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Chemistry [1200](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) and [1001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)).
   3. Human Biosciences [2001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or the former Biochemistry 2101 or Biochemistry [2201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)), [2002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [2600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)), [2003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [3206](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) or [3106](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)), [2004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [2100](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) or [2200](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)), [2901](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [2901](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)), [3001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3005](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3906](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [3906](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)), [3907](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/) (or Biochemistry [3907](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)), [499A/B](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/).
   4. Human Biosciences [4800](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/).
   5. At least 15 credit hours from Human Biosciences courses at the 3000 or 4000-level, at least 9 credit hours of which are from the 4000-level.
   6. Medicine [310A/B](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/).
   7. Chemistry [2400](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/).
   8. A sufficient number of elective courses to bring the total for the degree up to 120 credit hours.

#### [11.8.3 Human Biosciences Concentrations](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#11.8.3)

While meeting the requirements for a program in Human Biosciences, students may choose to select courses in one of the following formal concentrations, which, if completed, will be noted on the student’s transcript.

Particular attention should be paid to necessary prerequisites when scheduling courses. Students should consult with the Academic Advisor regarding the availability of courses applicable to their chosen concentration. Students completing a Minor in Human Biosciences will not be able to complete the requirements to achieve a concentration.

#### [11.8.3.1 Biochemistry](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#11.8.3.1)

Students selecting the Biochemistry concentration are required to complete 15 credit hours from the following courses:

Human Biosciences [3101](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3105](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4101](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4106](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4200](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4232](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), Chemistry [2100](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), Chemistry [2401](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)

#### [11.8.3.2 Health and Disease](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#11.8.3.2)

Students selecting the Health and Disease concentration are required to complete 15 credit hours from the following courses:

Human Biosciences [3101](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4230](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4231](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4232](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4301](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4240](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), Biology [3050](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), Biology [3052](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), Chemistry [4701](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)

#### [11.8.3.3 Gene Regulation](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#11.8.3.3)

Students selecting the Molecular Biology concentration are required to complete 15 credit hours from the following courses:

Human Biosciences [3207](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4101](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4104](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4231](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4240](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), Biology [2250](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3951](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4241](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4606](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)

#### [11.8.3.4 Nutrition](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#11.8.3.4)

Students selecting the Nutrition concentration are required to complete 15 credit hours from the following courses:

Human Biosciences [3402](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [3600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4106](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4230](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4240](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4242](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4300](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [4301](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), Biology [3052](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/)

#### [11.8.4 Minor in Human Biosciences](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/#11.8.4)

Students who wish to take a minor in Human Biosciences will successfully complete:

1. Human Biosciences [2001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [2002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [2003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/), [2004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/11/8/).
2. Twelve credit hours in Human Biosciences courses at 3000 or 4000-level.  
   Note: Course prerequisites stipulated in the course descriptions shall apply to a minor in Human Biosciences.

Human Biosciences courses are designated by HUBI.

##### [HUBI 1001 Food, Drugs, and Your Body](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321162)

examines the substances humans put into their bodies and the impact the substances have on cellular physiology and metabolism. With a special emphasis on current trends, the course introduces the concept of foods and drugs, how they are metabolised by the body, the social and political implications of foods and drugs, how they can influence overall health, and the sometimes grey areas between foods and drugs.

EQ: Biochemistry [1600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 1430 Biochemistry for Health Professionals](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321164)

is an introduction to the chemistry and structure-function relationships of DNA, carbohydrates, lipids and proteins. It will examine the basic metabolism of carbohydrates and fats, with emphasis on the biochemical fluctuations that occur in human health and disease, and will include a brief introduction to molecular genetics. Prospective [Bachelor of Science in Nursing (Collaborative)](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-nursing/4/1/) program students should consult with the Faculty of Nursing concerning admission to this course.

CR: the former Biochemistry 2430

EQ: Biochemistry [1430](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

LC: 4

PR: Level 3 Chemistry or Chemistry [1010](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or Chemistry [1810](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or equivalent

UL: may not be used for credit to fulfil the requirements for the Human Biosciences major

##### [HUBI 2001 Introduction to Biochemistry](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321165)

is an introduction to the major macromolecules of living organisms; proteins, nucleic acids, carbohydrates, and lipids: their structure, relationship, and biochemical function. Other topics include: enzymes; the biochemistry of membranes; and an introduction to cellular signalling.

CO: Chemistry [2400](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

CR: the former Biochemistry 2101, Biochemistry [2201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), Pharmacy [2004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), or the former Pharmacy 3110

PR: Chemistry [1051](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 2002 Introduction to Human Nutrition](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321166)

gives an overview of human nutrition with an emphasis on topics of current interest. Students will gain an understanding of nutrition in the context of health maintenance across the life span. Topics covered will include Canada's Food Guide, nutrient requirements, obesity and weight loss, sports nutrition, and nutrition in the prevention of chronic diseases.

EQ: Biochemistry [2600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), Human Kinetics and Recreation [2600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 2003 Basics of Human Metabolism](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321167)

examines how we digest, absorb, and metabolize carbohydrates, fats, proteins, and micronutrients. Students will learn the processes involved in human metabolism including glycolysis, the citric acid cycle, amino acid metabolism, the pentose phosphate pathway, fatty acid metabolism, oxidative phosphorylation and ATP synthesis, and triacylglycerol synthesis and storage. These topics will be presented in the context of linking metabolism and health.

CR: Biochemistry [3206](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), [3106](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), and Pharmacy [3111](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: Biology [1001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 2004 Fundamentals of Modern Molecular Biology](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321168)

will introduce the mechanisms by which genomic information is stored, and expressed; and how expression is regulated. Topics will include nucleic acid structures, DNA replication, RNA transcription and splicing, and how proteins are synthesised. Molecular biological techniques, their applications to biotechnology used in the advancement of food and drug development, and the implications for modern living will be discussed.

CR: Biochemistry [2100](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), [2200](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: Biology [1001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 2901 Biochemistry Laboratory](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321169)

develops robust basic biochemistry lab skills in the context of a biotechnology project; students purify and characterize a recombinantly expressed enzyme. Students learn skills including safety, pipetting, buffer calculations, making solutions, protein bioinformatics, techniques for protein enrichment, enzyme kinetics measurements and calculations, graphing data, keeping a lab book, teamwork, critical analysis and presentation of their work in several formats. Students may co-author a scientific publication based on their results.

AR: attendance is required in the laboratory component of this course

CO: Chemistry [2400](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

EQ: Biochemistry [2901](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

LH: 3

PR: Chemistry [1051](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), Science [1807](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) and Science [1808](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 3001 Lipids and Health](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321170)

covers core concepts of lipids and membranes, particularly as applied to human health and disease. Students will learn classification, structure, reactions, biosynthesis and oxidation of lipids including fatty acids, cholesterol, phospholipids, lipoproteins and other lipid species. Also covered are lipid digestion, absorption and storage, fat soluble vitamins, bile acids and steroid hormones, cell membranes and associated proteins, lipids-barrier interactions such as blood-brain and placenta, vesicular trafficking and an introduction to lipidomics.

PR: HUBI [2003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3206](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or [3106](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or Pharmacy [3111](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/))

##### [HUBI 3002 Carbohydrates: Functions in Human Health and Disease](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321172)

covers concepts of carbohydrates and glycobiology, specifically, their role in sustaining life and maintaining health and preventing disease. Students will learn the classification, structure, function, reactions, biosynthesis, and oxidation of carbohydrates. Additional topics covered include carbohydrate digestion, absorption and storage, roles of vitamins and minerals in the metabolism of carbohydrates, the recognition of specific glycans by proteins, role of glycans in complex biological systems and glycolytic modifications of lipids, proteins, and nucleic acids.

PR: HUBI [2001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or the former 2101) or Pharmacy [2004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or the former Pharmacy 3110), HUBI [2003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3206](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or [3106](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)) or Pharmacy [3111](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 3003 Proteins and Health](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321173)

covers core concepts of amino acids and proteins with a particular focus on their relationship to human health and disease. Students will learn about dietary proteins as sources of amino acids, amino acid requirements, synthesis, structure and function, body protein synthesis, trafficking, translation, post-translational modifications, and interactions with other proteins, lipids, carbohydrates, nucleic acids and drugs. The course includes protein methodology such as structure determination and prediction, immunohistochemistry, bioinformatics and computational modelling.

PR: HUBI [2001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or the former 2101) or Pharmacy [2004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or the former Pharmacy 3110), HUBI [2003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3206](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or [3106](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)) or Pharmacy [3111](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 3004 Cellular Signaling](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321174)

provides a comprehensive overview of how cellular function adapts to changes in the environment, how this relates to human disease, and examples of how nutrients, therapeutic and illicit drugs, and Indigenous medicines interact with signalling cascades. The impact of intracellular signalling on survival, differentiation, and other cellular outputs will be covered. These include, but are not limited to, mineral and vitamin signalling, cytokine and chemokine signalling, gaseous signalling molecules, cyclin-dependent kinases, and receptor signalling pathways.

CR: Biochemistry [3108](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: HUBI [2001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or the former 2101) or Pharmacy [2004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or the former Pharmacy 3110), HUBI [2002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or Human Kinetics and Recreation [2600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/))

##### [HUBI 3005 Environment-Health Interactions](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321178)

will provide a comprehensive overview of the effects and interactions of major environmental factors with human health. Students will learn how exogenous compounds such as food additives, allergens, drugs, toxicants, as well as probiotics, prebiotics and microbiomes interact with and affect human cellular homeostasis. Impacts of food sustainability, food policy, food ecosystems, digital literacy, and lifestyle on populations including Indigenous communities will be discussed.

PR: HUBI [2002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or Human Kinetics and Recreation [2600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/))

##### [HUBI 3052 Food Microbiology](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321179)

is the study of the microbiology of water and food with regard to the beneficial and detrimental roles of microorganisms on interaction with these systems. Emphasis will be on the microbiology of food, fermentations, food spoilage and food borne vectors of human disease.

EQ: Biochemistry [3052](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), Biology [3052](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

LH: 3

PR: Biology [3050](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) and Science [1807](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) and Science [1808](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 3101 Immunology](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321181)

is an introduction to the cells and organs of the innate and adaptive immune systems. The molecular and cellular basis of allergy, autoimmunity, vaccination and cancer immunology will also be discussed.

EQ: Biochemistry [4105](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), Biology [4200](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), and Pharmacy [3006](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: HUBI [2001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or the former 2101)

##### [HUBI 3105 Physical Biochemistry](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321182)

examines topics such as: types of intermolecular forces in biomolecules; the folding of biomolecules and the role of water; pH, buffers, and ionisation of biomolecules; thermodynamics: equilibria, coupled reactions, transport across membranes and redox reactions; and ligand binding. Other topics will include: size and shape of biomolecules; isotopes in biochemistry; and spectroscopy of biomolecules.

EQ: Biochemistry [3105](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

OR: a two hour problem-solving class

PR: HUBI [2001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or the former 2101)

##### [HUBI 3207 Nucleic Acid Biochemistry and Molecular Biology](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321183)

examines the structure, function and biochemistry of DNA and RNA and the biochemical processes in the flow of information from the gene to protein. These will include: DNA replication, recombination and repair processes; transcription of RNA and RNA splicing; and protein synthesis. The regulation of gene expression will also be covered at an introductory level. The course will also include an introduction to cloning methodology.

CR: Biochemistry [3107](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

EQ: Biochemistry [3207](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: HUBI [2001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or the former 2101), and HUBI [2004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2100](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or [2200](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), or Biology [2250](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/))

##### [HUBI 3402 Food Chemistry](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321184)

covers the following topics: water structure and the role of water in chemical reactions and mechanical properties of foods; chemistry and physical properties of carbohydrates, proteins and lipids; oxidative processes in food, food dispersions; pigments and natural colorants; food flavour; enzyme properties, immobilization and applications; enzymic and non-enzymic browning; food phenolics and natural antioxidants; food additives; and chemical changes in foods during processing.

EQ: Biochemistry [3402](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

LH: 3

PR: HUBI [2001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or the former 2101), Chemistry [2400](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), Science [1807](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) and Science [1808](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 3600 Sports and Exercise Nutrition](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321185)

deals with the specific roles of nutrients in sport and exercise, and the application of nutrition to sport and exercise.

CR: the former Biochemistry 4241

EQ: Biochemistry [3600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: HUBI [2002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or Human Kinetics and Recreation [2600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)), and one of Medicine [310B](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or Human Kinetics and Recreation [2320](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 3906 Nutritional Biochemistry and Metabolism Laboratory](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321186)

teaches advanced biochemical lab and critical thinking skills with a focus on metabolism and nutrition-related biochemistry. Topics may include animal diet formulation, tissue culture, immunoblots, metabolic flux assays, metabolic regulation, nutrient metabolism, metabolomics and metabolic energetics. Students develop their quantitative reasoning, teamwork, and written and oral communication skills. Students may have opportunities to tour lab facilities and to co-author a scientific publication based on their results.

AR: attendance is required in the laboratory component of this course

CR: Biochemistry [3906](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

LH: 3

PR: HUBI [2003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3206](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or [3106](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), or Pharmacy [3111](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)), HUBI [2901](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2901](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)), Science [1807](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) and Science [1808](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 3907 Molecular Biology Laboratory](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321187)

develops biochemical lab and critical thinking skills through a molecular biology focused project. Topics may include restriction digestion, PCR amplification-based techniques, recombinant DNA and plasmid construction, gene expression systems, nucleic acid bioinformatics, and application of high through-put methods in molecular biology. Students develop their quantitative reasoning, teamwork and communication skills (written and oral). Students may have the opportunity to coauthor a peer-reviewed scientific publication based on their results.

AR: attendance is required in the laboratory component of this course

EQ: Biochemistry [3907](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: HUBI [2001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or the former 2101), and HUBI [2004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2100](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), [2200](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), or Biology [2250](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)), HUBI [2901](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2901](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)), Science [1807](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) and Science [1808](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 4002 Biochemical Regulation](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321188)

examines metabolic regulation at the cellular and multicellular level. Topics will include control theory, biosynthesis and mechanism of action of hormones, signal transduction and endocrine coordination of metabolic processes. Principles are illustrated by the use of case studies from the medical literature.

EQ: Biochemistry [4002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

LC: two to three hours per week, together with assigned reading and case studies

PR: HUBI [2001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or the former 2101), HUBI [2003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3206](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or [3106](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)), HUBI [2004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2100](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or [2200](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), or Biology [2250](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/))

##### [HUBI 4101 Proteins](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321189)

will review the history of protein research and the general properties of proteins and include other topics such as strategy and methods for purification, chemical structure, properties, modification and determination of the protein amino acids, sequencing strategy, chain cleavage methods and end group analysis; folding of the protein main chain and techniques to determine structure; and the relationship between structure and function: protein filaments, motors and regulators. It will also cover disease-related proteins and other examples from the current literature.

EQ: Biochemistry [4101](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

LC: two to three hours per week, together with assigned reading

PR: HUBI [3003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3105](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/))

##### [HUBI 4102 Current Topics in Biochemistry](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.324585)

is a seminar course in which faculty and students will discuss topics of current interest in the biochemical literature. Students will be responsible for reading and critically assessing recent literature.

EQ: Biochemistry [4102](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: Honours Biochemistry students in their final year or permission of the Head

##### [HUBI 4104 Eukaryotic Gene Regulation and Developmental Biology](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321190)

details the cellular and molecular aspects of eukaryotic gene regulation and development. Topics to be covered will include the DNA content and organization of eukaryotes, mechanisms controlling the expression of eukaryotic genetic information at the transcriptional and post-transcriptional levels, and the methodologies used to define these mechanisms. Detailed consideration will be given to the cell-surface events which regulate nuclear gene expression and cell lineage specification. Developmental mechanisms operating in a number of model systems will be discussed.

EQ: Biochemistry [4104](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: HUBI [3004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3108](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)), and HUBI [3207](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3207](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or [3107](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/))

##### [HUBI 4106 Regulation of Metabolism](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321191)

is an advanced metabolism course covering the regulation of human metabolism. The course emphasis is on the regulation and integration of metabolism across various cells and tissues in states of nutrient excess and deprivation. Topics covered include citric acid cycle, urea cycle, hormonal regulations, cellular glucose sensing, glycogen, lipid and amino acid metabolism, and regulation of oxidative phosphorylation. Additional topics include metabolic flexibility, minor molecules with important impacts on metabolism and metabolic diseases.

PR: HUBI [2003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3206](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or [3106](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/))

##### [HUBI 4200 Bioenergetics and Biological Oxidation](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321192)

examines topics such as: respiration and electron transport; the functional organization of energy transducing membranes; the structure and function of flavoenzymes, cytochromes, iron-sulfur proteins and quinones; enzyme reduction of oxygen; and, free radicals in biological systems.

EQ: Biochemistry [4200](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

LC: two to three hours per week and assigned reading

PR: HUBI [2003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3206](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or [3106](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/))

##### [HUBI 4201 Membranes - Structure and Function](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321194)

examines the structure of model and biological membranes, the molecular interactions between membrane components and the effects of these interactions on the biophysical and functional properties of membranes. Other topics will include the structure-function of specialized membranous systems, such as lipoprotein, lung surfactant, and lipid rafts; membrane lipid composition in biochemical adaptation and function; and the role of membrane proteins in intracellular trafficking, receptor function, enzymatic activity and membrane-related diseases.

EQ: Biochemistry [4201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: HUBI [3001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3105](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/))

##### [HUBI 4230 Lipid and Lipoprotein Metabolism](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321195)

is designed to provide current knowledge about advances and controversies in lipid and lipoprotein metabolism in the context of health and disease. Topics to be covered include advanced knowledge about lipid and lipoprotein synthesis and regulation, reverse cholesterol transport, plus lipid and lipoprotein utilization to regulate cellular and physiological functions. The covered topics will be related to areas such as reproductive biology, atherosclerosis, AIDS, Alzheimer’s, and cancer.

CR: Biochemistry 6000

EQ: Biochemistry [4230](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: HUBI [3001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 4231 Molecular Biology of the Bacterial-Human Interface](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321196)

will explore the molecular biology of the bacteria that inhabit or invade human bodies, how these bacteria get established in humans, the biochemical mechanisms by which some bacterial pathogens can damage the host, and the contest for essential nutrients (e.g. iron) between bacteria and host.

EQ: Biochemistry [4231](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: HUBI [3207](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3207](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or [3107](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)), or permission of the course instructor

##### [HUBI 4232 Enzymes and Receptors](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321197)

provides students with the tools to identify which drug will have more therapeutic benefit or greater risk of toxicity, and how drugs are altered to make them more effective. The majority of approved therapeutics are active due to interactions with either an enzyme or a receptor, and this course will examine how these interactions are studied and quantified to allow comparisons, and how this information directs drug discovery efforts.

EQ: Biochemistry [4232](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: HUBI [2001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2201](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or the former 2101), HUBI [3004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3108](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/))

##### [HUBI 4232-4239 (Excluding 4232) Special Topics in Biochemistry](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.324640)

will be given for senior undergraduates, and will cover a range of topics in specialized fields in Biochemistry. They may be taught by visiting specialists when available.

PR: to be determined at the time of offering

##### [HUBI 4240 Nutrient-Gene Interactions and Personalized Nutrition](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321198)

is designed to provide greater understanding of the relationships between nutrients and the genome, the potential to design personalized diets based on the genetic makeup of an individual and ethical issues. Students will develop an appreciation for the roles of nutrients in direct interactions with genes to regulate metabolic processes, thereby maintaining health and preventing diseases.

EQ: Biochemistry [4240](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: HUBI [2002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or Human Kinetics [2600](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)), HUBI [2003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [3206](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or [3106](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)), HUBI [2004](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) (or Biochemistry [2100](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or [2200](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), or Biology [2250](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/))

##### [HUBI 4241-4249 Special Topics in Nutrition](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.324641)

will be given for senior undergraduates, and will cover a range of topics in specialized fields in Nutrition. They may be taught by visiting specialists when available.

EQ: to be determined at the time of offering

##### [HUBI 4300 Controversies in Nutrition](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321199)

is a course in which current controversies and trends in human nutrition are presented and discussed using the scientific literature.

EQ: Biochemistry [4300](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: HUBI [3001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), [3002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) and [3003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or the former Biochemistry 3203, and Medicine [310B](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 4301 Nutrition and Disease](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321200)

is a course which uses current literature to discuss the relationships between dietary habits, nutritional status and chronic disease risk; the scientific basis for nutritional interventions used in the treatment of chronic diseases commonly affecting Canadians is also part of the course content.

EQ: Biochemistry [4301](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

PR: HUBI [3001](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/), [3002](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) and [3003](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) or the former Biochemistry 3203, and Medicine [310B](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

##### [HUBI 4800 Human Biosciences Capstone](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321202)

is a seminar course in which faculty instructors and students will meet to discuss concepts and methods related to the study of human health. Students will have the opportunity to read and critique current literature, discuss the literature with peers, and work with a faculty mentor to design a research protocol relevant to human biosciences.

PR: Restricted to Human Biosciences major and honours students with at least 60 credit hours in courses

##### [HUBI 499A and 499B Dissertation](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/#d.en.321203)

is the independent study of a problem in life sciences and is obligatory for Honours students in Human Biosciences. Faculty advisors will guide the subject of study which must be approved by the Head of the Department or delegate. The written dissertation shall be submitted by the end of the tenth week of the second semester. At the end of that semester the student will give an oral presentation and answer questions on their study.

CH: 6

CR: Biochemistry [499A and 499B](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)

OR: Occasional classes will be held to guide and advise students in the preparation of their written reports. Students are expected to attend these classes.

PR: Honours students in their final year or permission of the Head; Science [1807](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/) and Science [1808](https://www.mun.ca/university-calendar/st-johns-campus/faculty-of-science/13/8/)