

BACHELOR OF SCIENCE IN MEDICAL SCIENCES

Student handbook

dal.ca/medical-sciences

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Medical Sciences Core Curriculum Maps

The Medical Sciences Program has a number of options for completing your degree. Please consult the course maps listed [on our website](#) for academic planning and guidance. Note that these are intended as tools to help you plan and ensure you are meeting your degree requirements, but not the only options for how to structure your degree. Please reach out to [Kate Strapps](#), Medical Sciences Advisor, if you would like to discuss further options and course plans.

Introduction

The Medical Sciences program is a 4-year Bachelor of Science program aimed at students who wish to initiate studies in medical science as undergraduates and pursue careers in the health field. The program introduces you to many varied subjects such as human anatomy and physiology, neuroscience, epidemiology, and medical ethics.

In the first two years of the program, you will take **core courses** in Biology, Chemistry, Math, Statistics, Biochemistry, Neuroscience, Physiology, Microbiology, Social Determinants of Health, and Psychology. These courses will not only provide a solid background in basic sciences, but will help prepare you for future admission tests for various medical sciences disciplines (such as the MCAT or DAT), meet (or exceed) the early prerequisites for acceptance into health-related professional faculties (such as Medicine, Dentistry, Pharmacy, and Nursing) locally and across the country, and meet (or exceed) the early prerequisites required for acceptance into biomedical sciences graduate programs at Dalhousie and across the country. In your third and fourth years, you will take core and elective courses in various subjects within the medical sciences. When you graduate, you will have a broad biomedical science background that will prepare you for a wide range of

professions, including a variety of clinical professional programs, graduate school, employment in the biotechnology industry, health administration, and in government.

Additionally, the required core courses are designed to meet prerequisites of more senior courses called **Selectives and Advanced Selectives**. Selectives are courses on a predetermined list provided by the program and cover many relevant biomedical fields. You can choose your selective courses such that they result in a more specialized education in an area of emphasis (in Immunology or Biochemistry, for example), to allow you to explore your interests further, or to satisfy course or professional program prerequisites. Selectives will also support you if you want to take advanced courses in a chosen area of interest in your fourth year, to pursue Honours research if you wish, and to be excellent candidates for graduate programs in a specialized field at Dalhousie or elsewhere in Canada.

The program also includes open **Electives**, which allow you to take any course offered at Dalhousie (at the appropriate level). You will be encouraged to fulfil the Writing requirement using one or both electives in the first year (see Degree Requirements below). You may also refer to the Medical Sciences advisor's list of popular electives for suggestions. You can

fill the elective slots with selectives if you wish; the reverse will not be allowed.

Medical Sciences Degree Programs

(a) Honours and Major: Medical Sciences offers a 4-year, 120-credit hour Bachelor of Science leading to an Honours BSc in Medical Sciences or a BSc in Medical Sciences (Major). The academic requirements for the Honours and Major degree are the same, with the following exceptions:

- If you choose to pursue **Honours** (SCIE 4901/4902), you will be working on an independent research project on a medically-relevant topic with a supervisor of your choice (in any appropriate department at Dalhousie), as approved by the Medical Sciences Honours Committee. Furthermore, you will be required to attend class in the Fall term, and, by the end of Winter term, complete a thesis on your work and defend that work in a research forum among your peers. You will be eligible to enter the Honours program if you have a minimum GPA of 3.0 in your 2nd & 3rd year core courses (excluding Physics) and have secured a supervisor. For more information about the Medical Sciences Honours program, please refer to the **Medical Sciences Honours Handbook**.
- If you pursue a **Major**, you will be required to take one extra selective in the Fall term and an interdisciplinary Capstone course in the Winter term of your 4th year to replace two Honours Research Courses, SCIE 4901/4902.
 - There is additional flexibility in course selection for students pursuing the Major. Please

consult the [curriculum maps](#) on our website for further information.

(b) Minor: While enrolled in the Medical Sciences program, with very careful planning, you may have the opportunity to pursue a minor. The minor subjects in which you may study usually require a minimum of 18 credit hours above the 1000-level. Because you cannot double count credits for a major and minor subject (i.e., **any core course or selective credit in Medical Sciences cannot be used towards your minor**), you will have to take your minor subject courses during your elective time. However, there are only 15 credit hours of available elective time beyond first year in the current curriculum.

Therefore, although obtaining the requirements for both the Medical Sciences degree and the minor may prove somewhat challenging, it is doable with proper guidance.

There are four possible pathways toward obtaining a minor:

(i) Minor subject course in first year

If you transfer IB, AP, or CEGEP credits in your first year, this may free space to take an additional course or courses. Some courses above the 1000-level can be taken in first year because the course has no prerequisites, or you have been given the Instructor's permission. You may take a minor subject course or a second-year core course (for example, BIOL2020) in first year. In this instance, you have the space in the Medical Sciences curriculum to take all the required credit hours to

obtain a minor while still fulfilling the requirements of the Medical Sciences degree; no extra time outside of the curriculum is needed.

(ii) Minor subject, core, or selective course during the summer

You may choose to take a core course, selective, or a course in your minor subject during the summer to allow space in the curriculum during the regular academic year. This means that you will be taking an extra semester (a summer semester) to complete the degree.

(iii) Additional semester other than summer

If you follow the current Medical Sciences core curriculum (8 semesters), you may have to obtain your final 3 credit hours for your minor subject in an extra semester (other than summer) and lengthen your degree completion time.

(iv) Additional course load within the curriculum

You may choose to take an extra course during an existing term (i.e., 6 courses instead of 5). The term and year during which you take the extra course is up to you. You will have to request special permission from the Registrar's Office to take more than 5 courses in a term. This option is not recommended as the current Medical Sciences curriculum is already sufficiently challenging.

(c) 90-credit hour degree: The Medical Sciences Program has recently launched a 90 credit-hour Bachelor of Science, Medical Sciences (General). This is a new degree option for eligible students who are leaving the program early (e.g., to start a

Pharmacy degree). **This degree option is only available to students enrolled in the Medical Sciences Program and you must be granted permission from the Medical Sciences Advisor, the Medical Sciences Program Manager, and the Assistant Dean, Student Affairs in the Faculty of Science.** The 90-credit hour degree captures the first three years of the Medical Sciences core curriculum and students must complete all required courses in years one to three to satisfy degree requirements. Honours, capstone, and the core course in epidemiology (EPAH 4010) are not required for graduation.

Degree Requirements

(a) Medical Sciences Degree Requirements

The Bachelor of Science in Medical Sciences is a 120-credit hour degree. Yes, you will need introductory courses completed before proceeding to year two (BIOL & CHEM in particular)*, and yes, we recommend you take a writing course in your first-year elective space to fulfil the Dalhousie writing requirement (see Writing Course Requirements under the General Degree Requirements for an Undergraduate Degree in the Academic Calendar; also **Note III** below), but there is definitely some flexibility in what you take when. Just make sure you take all the required core courses, the required number of Selective and Elective credits, and the general degree requirements, and you will graduate with your Medical Sciences degree. You must remember that some courses have prerequisite courses and grade requirements (see below), so please keep this in mind when you are considering moving courses around. If you plan on shifting courses, it may be best to

arrange to speak with the Medical Sciences advisor to discuss your options ([Medical Sciences Advising](#)).

**Notes about first year courses:*

(i) IB/AP/CEGEP - If you have credits to transfer as first year credits, you are free to do so. Most commonly, students transfer English and Biology (you may also be eligible to transfer your Physics credit).

The Biology prepares you well for second year Biology courses such as BIOL 2020 (Cell Biology), where a minimum amount of extra reading may be required. Many students choose to take the Introductory Biology anyway, as it allows them to perform better and increase their GPA. We are less likely to recommend transferring Chemistry because we feel the first-year CHEM courses (CHEM 1011/1012) aptly prepare you for the second-year Organic Chemistry courses (CHEM 2401/2402) and Biochemistry course (BIOC2300). Without CHEM 1011/1012 in first year, you may find Organic Chemistry and Biochemistry to be quite challenging.

It is important to note that professional schools have different policies regarding transfer credits. For example, some schools may not consider transfer credits towards course weight or GPA. **Not all post-graduate and professional programs are the same so please be familiar with different policies regarding transfer credits.** If you have questions about transfer credits, please contact the [Transfer Credit Team](#) in the Registrar's Office for more information.

(ii) Reduced Course load

You may have the opportunity to take fewer courses than the five listed in the curriculum for each term (this may be a result of transferring credits or for other reasons). At Dalhousie, you must only take **three** courses per term to be considered full time. However, keep in mind that some post-graduate programs, when calculating overall GPA, will only include years where five courses have been taken. Additionally, if you hold a scholarship, it may be impacted by a reduced course load. We recommend you speak to an advisor in the Awards office if you have a scholarship and want to reduce your course load (awards@dal.ca).

If you feel that reducing your course load is the best option for you, then please contact [Medical Sciences Advising](#) so you can discuss your situation further and find a solution that works best for you. This holds true for any year of study in the program.

(iii) Writing Requirement – There are several courses that satisfy the University writing requirement (please refer to the Dalhousie Academic Calendar for a list of approved courses). In some cases, students need to take 6 credit hours of designated writing course(s) from the same subject area to fulfill the writing requirement.

ASSC 1111 and SCIE 1111 are the exceptions to the 6-credit hour writing requirement, in that you can take either ASSC 1111 or SCIE 1111 alone as it will fulfill your writing requirement for your Medical Sciences degree with a single 3 credit hour course.

Keep in mind that some professional programs require students to take 6 credit hours of writing courses as part of their admission requirements, sometimes from a specific subject, eg. English. Therefore, if you are interested in any such programs for the future, you should keep this in mind when choosing writing course(s). This information for professional program admission requirements is generally available on the websites for the respective programs, and it is always best to check directly with the source. It is important to note that writing courses that don't have the ENGL subject code will not be counted as an ENGL. Additionally, if you choose to undertake your first year in the Integrated Science Program (see **Note IV** below), you will satisfy the University writing requirement but it will not be counted as an ENGL. **Not all post-graduate and professional programs have the same admissions requirements, so please take care to familiarize yourself with different school prerequisites.**

(iv) Integrated Science Program - You have the option of doing the Integrated Science Program at Dalhousie during your first year, as it is considered equivalent to the first year in Medical Sciences. This program gives you a foundation in not only core science courses such as Biology, Psychology, and Statistics, but also the ability to participate in research in your first year. The research project adds extra work (equivalent to a 6th course) so make sure the program is the right fit for you. Please visit the [Integrated Science website](#) for more information

(b) Medical Sciences Core Course Prerequisites

Year 2

- BIOL 2020 – min. C in BIOL 1010; recommend CHEM 1011 & 1012
- BIOL 2030 – min. C in BIOL 1010; recommend CHEM 1011 & 1012
- CHEM 2401 – min. C- in CHEM 1011 & 1012
- CHEM 2402 – min. C+ in CHEM 2401
- PHYL 2041 – BIOL 1010 & 1011 + CHEM 1012; exclusion with NESC 2470
- PHYL 2044 – BIOL 1010 & 1011 + CHEM 1012
- MICI 2100 – B- in BIOL 1010 & 1011, CHEM 1011 & 1012
- BIOC 2300 – C in BIOL 1010 & 1011, CHEM 1012

Year 3

- MICI 3115 – B- in BIOL 2020, BIOL 2030, BIOC 2300, MICI 2100
- ANAT 3010 – BIOL 2020
- PATH 3000 – BIOL 1011 & BIOL 2020

Year 4

- SCIE 4901 + 4902 – supervisor plus min. 3.0 cGPA in 2nd & 3rd yr core courses, excluding PHYC 1310
- SCIE 4005 – writing requirement, PHAC 3030, MICI 3115, ANAT 3010, PATH 3000, & PHIL 2805 or 2810
- EPAH 4010 – STAT 1060, PHAC 3030, MICI 3115, & at least one of ANAT 3010, PATH 3000, PHIL 2805 or 2810, or EPAH 2010 (Soc Determ Hlth)

c) Selectives

A Selective is a course that comes from a **predetermined list, [provided to you by the Medical Sciences program](#)**. You can choose your selective courses such that they result in a more specialized education in an area of emphasis, to allow you to explore your interests further, or to satisfy course or professional program prerequisites. Selectives will also support you if you want to take advanced courses in a chosen area of interest in your fourth year, pursue Honours research, or prepare for graduate programs in a specialized field at Dalhousie or elsewhere in Canada.

Although it may be helpful for you to take more than one Selective in a single subject area, you are not obligated to do so. If you are undecided which area interests you most, you may want to take a few courses in each area to satisfy your interests. Also note that an area of specialization may include courses from more than one department (for example, if you are interested in Molecular Biology, you may be taking courses in Biochemistry, Biology, and Microbiology).

Students in both the Major and Honours streams are also required to complete 3 credit hours of **Advanced Selectives**, which are senior undergraduate courses at the 3000 or 4000 level. The Selectives list is organic and, therefore, changes on occasion. As a result, it is best to visit the Medical Sciences website (dal.ca/medical-sciences) to see the most up-to-date list. To receive a comprehensive list of Selective prerequisites, terms offered, and additional important information about the Selectives and areas of specialization, please contact the Medical Sciences advisor ([Medical Sciences Advising](#)).

(d) Electives

Any class offered at Dalhousie can be used as an elective, if you satisfy the course prerequisites. You can also contact the Medical Sciences advisor for a list of popular electives.

If you are interested in obtaining a minor, you will want to use your elective time for the minor-subject courses (remember, you are unable to count credits for both your minor and major subject, so any Medical Sciences core course or selective cannot be used toward your minor; but, if you satisfy your selectives credit requirements and want to use an additional selectives course outside of these credits for your minor, you can). As indicated above (page 5), pursuing a minor while enrolled in the Medical Sciences program takes careful planning. You may want to schedule a meeting with the Medical Sciences advisor to discuss the best way for you to pursue the minor degree. If you do not want to use your Selective time to fulfil professional school prerequisites, you can use your elective time to do so.

Summer Courses

You may choose to take courses in the summer. Dalhousie offers a wide range of summer courses, including some core Medical Sciences courses and some Selectives (please refer to the [Academic Timetable](#)). If you choose to take a course outside of Dalhousie, you will have to obtain permission from the Registrar's Office. The course will have to be considered equivalent to a Dalhousie course to receive transfer credits (please refer to the [Academic Support web page](#) for further information about courses from other universities).

Because different professional schools have different policies on summer courses, please make sure you are aware of those policies and what impact taking a summer course may have. For example, some schools will accept a summer course as an academic course requirement but will not consider it as a credit hour requirement or in the overall GPA. **Not all professional or post-graduate programs are the same so please be familiar with the different policies regarding summer courses.**

If you are considering a summer course, please arrange to meet with the Medical Sciences advisor to discuss your options.

NOTE: Many scholarships will not cover summer courses.

Research

If you are interested in gaining research experience, there are options that may allow you to do so. Firstly, the Integrated Science Program at Dalhousie (see **Note IV** above) gives you a foundation in core science courses and offers you the ability to participate in research in your first year. You'll do this by working on a research project with other Integrated Science students under the direction of a research supervisor. Please visit the Integrated Science website or arrange to meet with the DISP Director for more information.

If you would like to gain research experience after your first year, some researchers might be willing to take on student volunteers. Volunteering in a research facility will allow you to experience how research works and allow you to discover whether you like it or not. It may also lead to an Honours opportunity

for your 4th year. The Medical Sciences Program Manager or the Honours Program Coordinator will inform you of research opportunities that arise. However, it is better for you to seek opportunities yourself. You can do this by searching for Dalhousie research in a field that interests you and contacting different researchers within that field to see if they are accepting volunteers (from the Medical Sciences advisor you can obtain a list of faculty members who have already supervised Medical Sciences students in some capacity as a place to start your search). It is important to note that most researchers are unlikely to accept first year students, so your best chance is to arrange this for your second year or beyond. Additionally, researchers may be willing to pay you rather than have you volunteer (especially if you have completed a minimum of two years of undergraduate study and are looking to do research in the summer), but this will depend on the researcher.

Your chances of obtaining a research position will improve if you already have funding. During the second term of your second year, you may be eligible to apply for a Faculty of Science summer research award, such as the Natural Sciences and Engineering Research Council (NSERC) undergraduate student research award (USRA). For more information about summer student research awards, visit the [Faculty of Science website](#) or check the Medical Sciences [Brightspace community](#) for postings.

If you are interested in pursuing an Honours degree in Medical Sciences, you will have to secure a supervisor by the Winter term of your 3rd year before being accepted. Although your Honours project does not begin until your 4th year, some

students are able to gain experience (preparatory work) at the research site before 4th year commences. This is an arrangement that you will make with your supervisor. Please refer to the Medical Sciences Honours Handbook to gain more information about preparatory work for the Honours project.

You may also obtain research experience by taking one of three Medical Sciences research selectives: (i) SCIE 3100 – Medical Sciences Experiential Learning (aimed at those without any research experience), (ii) PHYL 3600 – Directed Project in Physiology, and (iii) SCIE 4101/4102– Directed Project in Medical Sciences (an independent research project for non-Honours students who have had some prior research experience). Both require a secured supervisor. For more information on these selectives, please contact the course coordinators.

Each research site will have different expectations of you, whether as a volunteer, paid employee, non-Honours, or Honours student, so please make sure this is clearly explained to you by your research supervisor.

Volunteering

Many volunteering opportunities exist outside of research. If you are looking to volunteer, consider opportunities in the health field, such as those at the Queen Elizabeth II (QEII), Victoria General (VG), or Isaac Walton Killam (IWK) hospitals in Halifax, or healthcare institutes outside of the city (including your family physician's office), senior's care facilities, non-profit organizations (e.g., MedLife Dalhousie), societies or organizations associated with groups with specific needs (e.g., Canadian National Institute for the Blind, The

Alzheimer Society of Nova Scotia, Canadian Mental Health Association) and many more. Volunteering will allow you to gain life experience and to meet new people. Fellow volunteers and those that benefit from your volunteer work can be a rich source of inspiration and help to develop your interpersonal skills. Volunteer opportunities are frequently posted on the Medical Sciences [Brightspace community](#).

Advising

Career path advising and the course selection process are critical to the success of the Medical Sciences undergraduate program. In addition to guidance with respect to professional schools, academic advising is provided so that you are aware of what courses are required should you want to enter graduate programs in the various biomedical science disciplines. In addition, you may choose to loop out of the Medical Sciences degree and enter a different undergraduate program, if that better suits your interests or career goals. An advisor can help you determine the best path for you.

If you are looking for advice concerning options within the program or what to do beyond the degree, please do not be afraid to ask for help. The **Medical Sciences Advisor offers one-on-one advising as well as group workshops each semester. First year students are required to meet with the Medical Sciences advisor in the winter term of their first year. Please pay attention to your Dal email for an appointment invitation.**

The Assistant Dean, Student Affairs, in the Faculty of Science also offers one-on-one advising, especially around academic

waivers, ILL grades, probation, and academic dismissal. They can be reached at scieasst@dal.ca.

The Bissett Student Success Centre also offers career and personal counselling. Career counselling helps you create strategies to cope with personal issues that affect your view of yourself and your future, as well as help you identify and develop methods to remove barriers that stand in your way of achieving educational and career goals. Personal counselling provides an opportunity to resolve problems, improve understanding, and learn new skills. It provides a supportive and confidential environment where you can talk openly about matters that cause you concern and distress. Visit the [Dalhousie Student Health and Wellness website](#) for more information about counselling services.

After Medical Sciences

The Medical Sciences degree opens many possibilities for you upon graduation. You may be considering professional school (for example, Medicine, Dentistry, Pharmacy, Nursing, Occupational Therapy, Physiotherapy, Speech-Language Pathology, Audiology, Optometry, or others), graduate school (Master's or PhD), the biotech industry, health administration, or government work. Whatever your interest in the medical sciences field, this degree will help you get there.

(a) Professional Schools

If you are considering professional school, it is important for you to be aware of the admissions requirements. This is ultimately your responsibility (there are [links](#) to professional school sites on

the Medical Sciences website dal.ca/medical-sciences under the "For Current Students" tab). If you would like a copy of these, please contact the Program Manager or Medical Sciences Clerk, but keep in mind that the information could change and that you must stay on top of that information yourself.

(b) Graduate Schools

If you are considering pursuing a research-based graduate degree (a Master's or PhD), you will have to complete a year-long independent research project course first. This may be as an Honours student, or by taking the SCIE 4101/4102 Directed Project in Medical Sciences Advanced Selective. Please refer to Section 2 *Medical Sciences Degree Programs* above, and the Medical Sciences Honours Handbook for more information about the Honours program or contact the course coordinator for more information about SCIE 4101/4102.

The broad-based, interdisciplinary nature of the Medical Sciences program will ensure graduates be well trained for graduate programs at Dalhousie and across Canada.

If you would like to discuss your plans and how to properly prepare, please do not hesitate to contact the Medical Sciences Program advisor or other available advisors outside of the program to help you.

Frequently Asked Questions

Do I have to declare my major as Medical Sciences?

No. Medical Sciences is a separate, direct-entry program, beginning in year one;

therefore, your Major (Medical Sciences) is chosen for you.

Can I do a double-major or combined honours with another subject?

No. The curriculum does not provide enough credit space to do so.

Is co-op available with Medical Sciences?

Co-op is not an option with Medical Sciences.

Can I study abroad?

Yes. Medical Sciences follows the same policies as the general Dalhousie regulations for international study. However, given the Medical Sciences core curriculum, studying abroad or doing an exchange will take careful planning. Timing and courses to take while away should be discussed with the Medical Sciences Advisor or another academic advisor as early in the degree as possible (deadlines for studying abroad usually occur in January, the year before travel).

Can I complete the Medical Sciences degree in 3 years?

The Medical Sciences curriculum makes it very difficult to complete the degree in 3 years. If you have transfer credits, take courses outside of the Sept–Apr academic year, and/or take more than 5 courses during the academic year, it may be possible, but it may also be quite challenging. A 90-credit hour degree option is available to students that meet the requirements and are exiting the program early. Students must consult the Medical Sciences Advisor, the Medical Sciences Program Manager, and the

Assistant Dean Student Affairs for this degree option.

Can I do the degree part-time?

Yes. Part-time studies are defined as 2 courses or fewer per term. If you complete the required courses in 10 years or less, you can obtain the degree on a part-time basis.

My friend wants to transfer into Medical Sciences. What should they do?

The Medical Sciences Program accepts very few students into second and third year each year. Students must apply to transfer in and will undergo a competitive assessment. Please reach out to the [Medical Sciences Advisor](#) for information about the process.

When do I write the MCAT/DAT?

Most students choose to write the MCAT/DAT either after their 2nd or 3rd year of study. You will be best prepared to write these tests after completing the courses in the main testing areas.