

MATHEMATICS, B.A. SINGLE ADVANCED MAJOR

Degree Requirements

Course	Title	Hours
Year 1		
MATH 1220	Linear Algebra 1 ¹	3
MATH 1230	Differential Calculus ¹	3
MATH 1232	Integral Calculus ¹	3
MATH 1240	Elementary Discrete Mathematics ¹	3
6 credit hours from your Minor area of study as described in that unit's section of the calendar		6
12 credit hours from outside of your Major and Minor areas of study		12
Hours		30
Year 2		
MATH 2080	Introduction to Analysis	3
MATH 2090	Linear Algebra 2	3
MATH 2150	Multivariable Calculus	3
6 credit hours from your Minor area of study as described in that unit's section of the calendar		6
15 credit hours from outside of your Major and Minor areas of study		15
Hours		30
Years 3-4		
MATH 2020	Algebra 1	3
MATH 2180	Real Analysis 1	3
MATH 3470	Real Analysis 2	3
MATH 2160	Numerical Analysis 1	3
or MATH 3440	or Ordinary Differential Equations	
15 credit hours from the following of which at least 3 credit hours must be at the 3000 or 4000 level:		15
MATH 2030	Combinatorics 1	
MATH 2040	Curves and Surfaces	
MATH 2070	Graph Theory 1	
MATH 2160	Numerical Analysis 1	
MATH 2170	Number Theory 1	
Any 3000 or 4000 level Mathematics course		
6 credit hours from your Minor area of study as described in that unit's section of the calendar		6
15 credit hours from outside of your Major and Minor areas of study		15
12 credit hours of open electives ²		12
Refer to the information directly below this list for other important degree requirements students need to complete prior to graduation		
Hours		60
Total Hours		120

- MATH 1500 (B) or MATH 1510 (B) may be taken in place of MATH 1230;
- MATH 1210 (B), MATH 1300 (C+) may be taken in place of MATH 1220;
- MATH 1700 (B) or MATH 1710 (B) may be taken in place of MATH 1232;
- MATH 1200 may be taken in place of MATH 1240, but these courses are not equivalent, i.e., students should note that MATH 1240 is a prerequisite to some 2nd year Mathematics courses for which MATH 1200 is not a prerequisite.

² MATH 1010, MATH 1018, MATH 1020, FA 1020, MATH 1080, and MATH 1090 may not be used for credit in this program.

Notes:

- For entry to either Major in Mathematics, the prerequisite is a grade of "C+" or better in six hours of Mathematics courses taken.
- A detailed listing of courses in the Department of Mathematics is available in the Calendar entries of the Faculty of Science.

While completing the courses listed above, students in the B.A. Advanced Degree must satisfy the University's Written English (W) and Mathematics (M) requirements, plus the following Faculty requirements in order to graduate:

Ten Faculty Requirements for Graduating with a B.A. Advanced Degree

1. A student must successfully complete a minimum of 120 credit hours from among the courses acceptable (<https://catalog.umanitoba.ca/undergraduate-studies/arts/#Courses-Acceptable-Credit>) for credit in the Faculty of Arts, with a "C" average or better on the courses that contribute to satisfying all of the B.A. Advanced Degree requirements.

The minimum 120 credit hours of passed coursework must include the remaining nine faculty requirements:

- At least six credit hours from subject fields (<https://catalog.umanitoba.ca/undergraduate-studies/arts/#Five-subject-field>) designated Humanities, at least six credit hours from subject fields designated Social Science, (<https://catalog.umanitoba.ca/undergraduate-studies/arts/#Arts-Social-Sciences>) at least six credit hours from the list of courses that satisfy the Science (<https://catalog.umanitoba.ca/undergraduate-studies/arts/#Arts-Science>) requirement, and at least three credit hours from the list of courses that satisfy the Indigenous Content (<https://catalog.umanitoba.ca/undergraduate-studies/arts/#Indigenous-Content>) requirement.
- At least three credit hours completed in each of five different Faculty of Arts (<https://catalog.umanitoba.ca/undergraduate-studies/arts/#Five-subject-field>) subject fields. A subject field may also satisfy other Bachelor of Arts requirements such as Humanities, or Social Sciences, or Indigenous Content, or Mathematics, or Written English.
- Single Advanced Major:** 48 credit hours which constitute a Single Advanced Major in one of the subject fields (<https://catalog.umanitoba.ca/undergraduate-studies/arts/#Five-subject-field>) approved by the Faculty of Arts. The student must have a minimum "C" average in courses where a final grade is recorded that are used toward the Major including only the higher grade of any course that has been repeated and excluding any failed course(s). A student who declares a Single Advanced Major must also complete a Minor with the exception of students whose Major is Global Political Economy. Students with an Advanced Major in Global Political

¹ Students are strongly advised to take MATH 1220, MATH 1230, and MATH 1232. The following substitutions are allowed (but not advised), provided the grades indicated in brackets are achieved:

Economy will not be required to complete a Minor for purposes of satisfying the degree requirements.

Double Advanced Major: At least 42 credit hours which constitute a Double Advanced Major in each of two subject fields (<https://catalog.umanitoba.ca/undergraduate-studies/arts/#Five-subject-field>) approved by the Faculty of Arts. The student must have a minimum "C" average in courses where a final grade is recorded that are used toward each Major including only the higher grade of any course that has been repeated and excluding any failed course(s). A student who declares a Double Advanced Major will not be required nor allowed to complete a Minor, but must complete the Double Advanced Major in accordance with the requirements as specified by the Major department. A Major may be declared once the prerequisite has been satisfied.

Note: No course can be used to satisfy both the Single Advanced Major and Minor requirement. Similarly no course can be used to satisfy both Double Advanced Majors. Not every department offers a Single or Double Advanced Major. Please refer to department (<https://catalog.umanitoba.ca/undergraduate-studies/arts/#programstext>) listings and other courses offered (<https://catalog.umanitoba.ca/undergraduate-studies/arts/#Courses-Acceptable-Credit>) in faculties and schools.

5. **Minor:** 18 credit hours which are in a subject field (<https://catalog.umanitoba.ca/undergraduate-studies/arts/#Five-subject-field>) that is different from that of the declared Single Advanced Major, which constitute a Minor approved by the Faculty of Arts. A student who declares a Single Advanced Major must also complete a Minor. A student who declares a Double Advanced Major will not be required nor allowed to complete a Minor. No course can be used to satisfy both the Advanced Major(s) and the Minor requirement. Only one Minor may be declared. A Minor may be declared once the prerequisite has been satisfied.
6. A student who declares a Single Advanced Major with a Minor must have at least 42 credit hours in subjects other than those used towards the Single Advanced Major and Minor. In addition, students in a Single Advanced Major must successfully complete 12 credit hours of coursework in any subject acceptable for credit in the Faculty of Arts including courses in the Major and Minor.

A student who declares a Double Advanced Major must have at least 36 credit hours in subjects other than those used towards their Double Advanced Major subject fields.

7. A student may not declare a Major/Minor combination in both Sociology and Criminology or both Italian and Italian Studies.
8. At least 81 credit hours that have been taught by the Faculty of Arts (may include up to 36 credit hours from the Department of Mathematics or Art History courses considered as Humanities), or which have been accepted on transfer as equivalent to courses taught by the Faculty of Arts.
9. At least 42 credit hours numbered at or above the 2000 level.
10. Residency Requirement: A student in the B.A. Advanced Degree Program must complete University of Manitoba residency requirements (see Residency Requirement (<https://catalog.umanitoba.ca/undergraduate-studies/arts/#Residency-Requirement>)).