Mathematics Flexible Pre-Major Requirements Update

Report to the BCcupms

May 2008

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Background

At the Yukon College meeting of the BCcupms in May 2007, action was taken to update the information contained in the *Mathematics Flexible Pre-Major Analysis Project* (2006) report. This was done in large measure to satisfy BCCAT's wish to publish the current requirements of the Mathematics Major programs in BC on their web site. The BCcupms responded by asking Leo Neufeld with the assistance of a small advisory group to undertake the task.

Action

At the advisory group's meeting in summer 2007, it was noted that the Mathematics Major (BSc) requirements from the 2006 *Analysis* report together with the Suggested Mathematics Pre-Major should be updated and made available for student-friendly presentation. No decision was taken on the question of when or how often the lower division requirements for a Math Pre-Major should be re-visited in order to maintain currency.

In 2008, the Receiving institutions of the report were contacted to determine whether their lower division Math Major program requirements had changed since 2006 and to specify any such changes. The resulting information was incorporated in the pages that follow. It is recommended that this updated information be made available to BCCAT.

Respondents from Receiving Institutions

Dr. Iliya Bluskov University of Northern British Columbia	Dr. Malgorzata Dubiel Simon Fraser University
Dr. John Byl Trinity Western University	Dr. Peter Dukes University of Victoria
Dr. Bruce Crofoot Thompson Rivers University	Dr. Rajiv Gupta The University of British Columbia (Vancouver)
Dr. Sylvie Desjardins The University of British Columbia (Okanagan)	Dr. Gillian Mimmack University of the Fraser Valley

Members of the Advisory Group

George Ballinger, Camosun College
David Leeming, University of Victoria
Wayne Matthews, Camosun College

Acknowledgments

Gratitude is extended to each of the Respondents for taking the time and effort to peruse the original *Mathematics Pre-Major Analysis Project* document and to suggested changes where necessary. Also, acknowledgment of the helpful advice and support given by members of the Advisory Group is hereby gratefully made.

Suggested Mathematics Pre-Major Program

For a college student wishing to proceed to the upper division of a Bachelor of Science Major in Mathematics program at a British Columbia university, the suggested Core courses and Additional courses that can be chosen to comprise a Mathematics Pre-Major program are listed below. This information may also prove useful to Sending institutions desiring to support the design of a Mathematics Pre-Major program. The schematic on the next page shows how this Suggested program fits into the specific Mathematics Major requirements at eight BC post-secondary institutions.

CORE Mathematics and Computer Science Courses

Calculus I, II, III
Linear Algebra
Discrete Mathematics I
Introduction to Real Analysis
Computer Science I, II

ADDITIONAL Mathematics, Statistics and Computer Science Courses

Ordinary Differential Equations
Statistics I
Discrete Mathematics II
Mathematical Modelling
Foundations of Modern Mathematics
Abstract Algebra
Statistics II
Operations Research

CORE English and Science Courses

English I, II
Lab-based Chemistry I
Lab-based Physics I, II

ADDITIONAL Science Courses

Lab-based Chemistry II
Biology

Core Courses are those required by 6 or more of the surveyed Receiving institutions in their Mathematics Major programs and can be considered a 'must' in any Mathematics Pre-Major program. The Additional Courses are requirements at five or fewer Receiving institutions. While Sending institutions might wish to design a Mathematics Pre-Major program satisfying local needs, students, who are intent on moving to a particular institution at which to complete their upper division courses, would be wise to choose courses satisfying the requirements at that institution.

Post-Secondary Institutions in BC and the Suggested Mathematics Pre-Major

This schematic lists by course number those Additional Mathematics, Statistics and Computer Science courses beyond the Core courses that are required at each of the BC Receiving institutions indicated. The course numbers at respective Receiving institutions are in parentheses.

<table>
<tr><th colspan="3">Recommended CORE plus ADDITIONAL Courses at Each Receiving Institution</th></tr>
<tr><td>UBC(V) Additional

Differential Equations (215)
Computer Science
[Confirm that Core CPSC courses transfer to UBC]</td><td>UBC(O) Additional

Differential Equations (225)
Statistics I (230)</td><td>SFU Additional

Discrete Mathematics II (201)
Statistics I (270)
Math Modeling (202)</td></tr>
<tr><td>UFV Additional

Differential Equations (255)
Statistics I (270)
Found. Modern Math (265)</td><td>Core Courses

Calculus I, II, III
Linear Algebra II
Discrete Mathematics I
Introductory Analysis
Computer Science I, II</td><td>UVic Additional

Differential Equations (201)
Abstract Algebra (233C)
Statistics I (260)
Statistics II (261)</td></tr>
<tr><td>TWU Additional

none</td><td>TRU Additional

Statistics I (200)
Discrete Mathematics II (270)</td><td>UNBC Additional

Linear Algebra I (220)
Differential Equations (230)
Found. Modern Math (224)</td></tr>
</table>

While the courses indicated above are sufficient to meet program requirements at the referenced institutions, it should be noted that, at some institutions, program flexibility permits a slight variation in the choice of courses as listed. Students are strongly advised to consult on-line calendars or to contact departmental advisors at their chosen institution to obtain further information about alternate course options or about any 'strongly recommended' courses in this particular Mathematics Major program.

Mathematics, Statistics and Computer Science Requirements in Mathematics Major Programs
At British Columbia Post-Secondary Institutions

Math Major Requirements	UBC(V)	UBC(O)	SFU	UVic	UNBC	TRU	TWU	UFV	Freq.
1st Year									
Calculus I	MATH 100	MATH 100	MATH 150 or 151	MATH 100	MATH 100	MATH 114	MATH 123	MATH 111	8
Calculus II	MATH 101	MATH 101	MATH 152	MATH 101	MATH 101	MATH 124	MATH 124	MATH 112	8
Discrete Math I			MACM 101	MATH 122	CPSC 141	MATH 170	MATH 150		5
Comp Science	CPSC 111	COSC 111	CMPT 120 / CMPT 126	CSC 110	CPSC 100	COMP 113	CMPT 140	COMP 152	8
Comp Science		COSC 121	CMPT 125	CSC 115		COMP 123	CMPT 145		5/4
2nd Year									
Calculus III	MATH 200	MATH 200	MATH 251	MATH 200	MATH 200	MATH 211	MATH 223	MATH 211	8
Diff Equations	MATH 215	MATH 225		MATH 201	MATH 230			MATH 255	5
Linear Alg I					MATH 220				1
Linear Alg	MATH 221	MATH 221	MATH 240	MATH 233A	MATH 226	MATH 212	MATH 250	MATH 221	8
Intro Analysis	MATH 220	MATH 220	MATH 242		MATH 201	MATH 220	MATH 220		6
Discrete Math II		COSC 221	MACM 201			MATH 270		MATH 225	4
Modern Math					MATH 224			MATH 265	2
Abstract Alg				MATH 233C					1
Math Modeling			MACM 202						1
Statistics I		STAT 230	STAT 270	STAT 260		STAT 200		MATH 270	5
Statistics II				STAT 261					1
Comp Science	CPSC 211								1
Course Totals									
Mathematics	6	6	8	7	8	7	6	7	
Statistics	0	1	1	2	0	1	0	1	
Comp Science	2	3	2/1	2	2	2	2	1	
Total	**8**	**10**	**11/10**	**11**	**10**	**10**	**8**	**9**	