

Report to the BCcupm:

**First-Year Core
Calculus**

Follow-up Survey

May 2003

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A. After One Year

How is it going after one year? What, if any, are the new, transfer challenges for students and post-secondary institutions in the province?

At its May 2002 meeting, the BCcupm adopted unanimously the recommendations of the First-Year Core Calculus Sub-committee. These recommendations included transfer guidelines for Sciences Calculus and Social Sciences/Business Calculus courses. There was strong optimism that the Core Calculus initiative would significantly benefit transferring students and also smaller, post-secondary institutions struggling to prepare students for a diverse array of transfer options.

In December 2002, the BC Council on Admissions & Transfer (BCCAT) published the Final Report of this initiative and sent copies of it to each post-secondary educational institution in BC and the Yukon. BCCAT also made the full Report available on its web site.

During the past year, individuals have informally reported ways in which the Core Calculus course outlines and what they represent have benefited them or the institutions they represent. So, it seemed appropriate, after one year, that a follow-up effort be conducted on this pioneering effort on behalf of the BCcupm.

B. Survey Questions and Responses

An informal, questionnaire consisting of six items was sent by e-mail to the head/chair of post-secondary mathematics departments in BC and the Yukon. Thirty institutions (including 4 new or inactive institutions) were contacted and responses were received from 22 colleges, university colleges, institutes and universities. Respondents were asked to answer 'Yes', 'No' or 'Uncertain' to the questions, and encouraged to comment further if they desired.

1. Accessibility

"Is the Core Calculus Curricula (CCC) document generally accessible to your mathematics department?"

All but one of the departments responded "Yes".

Some comments:

- The recommendations were distributed at several Math department meetings.
- Yes, it is on our shared drive.
- The Calculus course convenors were directed to review course content in light of the document.
- No, it has not been talked about. (At least I have not heard.)

The CCC document and its contents appear have been distributed widely and are, in the main, easily accessible to members of mathematics departments. Individual members teaching the calculus courses of small departments have taken custody of the CCC outlines.

2. Document Format

"Are the CCC outlines formatted in a manner that makes them easy to use in your department?"

As in the previous item, all but one of the departments responded "Yes".

Some comments:

- In fact, our dept. head seems eerily familiar with them.
- I feel confident that if someone else had to teach the courses, they would be able to determine the learning outcomes using the CCC outlines.
- The reference to particular chapters of a particular text as a means to provide details is too time and product dependent. Following the format of ministry secondary school IRP's and including sample problems for each topic would be much more beneficial.

It appears that a large majority of the respondents are content with the format of the CCC and find them adequate for their purposes. Reminder: the CCC descriptions are principally guidelines for evaluating actual course syllabi in order to assign transfer status.

3. Utility

"Has your department had occasion to use the CCC in making transfer or transfer-related decisions?"

Eight departments have and 14 have not directly had occasion to use the CCC with respect to course transfer. However, six departments have used the CCC in designing or modifying their calculus courses and 5 report having reviewed their courses in light of the CCC.

Some comments:

- The CCC have influenced the evolution of our business calculus course although transfer credit was never in question.
- Indirectly. The CCC set my mind at ease about our curriculum.
- The CCC document was extensively used in designing our calculus curriculum.
- We had a student from outside BC asking for calculus credit in our Comp Sci Prog.
- We are currently reviewing Calc II and using the CCC to decide on content weighting.
- The courses I have had to review have been fairly similar to what we offer, so use of the CCC was not necessary.

4. Need for Modifications

"Have you sensed the need for modifications in the CCC that would make them generally more-useful for transfer purposes?"

There were 18 "No" responses, 2 "Uncertain" and 2 "Yes" responses to this question.

Some comments:

- Too early to say. We might be able to answer this better after we've attempted to obtain transfer credit for our courses.
- The intent and the scope of the report are very succinct and for this reason it is in fact most useful.
- One modification would be to specify the level of difficulty/depth at which a topic should be covered, perhaps by providing exemplar problems.

The question about sensing a need to modify the guidelines was asked in order to elicit an early alert should some or major modifications of the CCC be necessary (see Recommendation 4 of the Core Calculus Report). Those responding "Yes" were seeking more-detailed topic specification or student evaluation components. Although discussed by the CCC Sub-committee, course delivery issues such as standards, use of technology and sample questions were deemed extraneous to the description of a set of core topics.

5. Adding to the Roster

"Are there other mathematics courses offered throughout the province that would benefit from the development of a core curriculum? Please name them."

Fifteen respondents felt that there are other first- and second-year courses that would benefit from having a core curriculum; four said "No" and three were "Uncertain".

Respondents named the following courses with the indicated frequency (note: some respondents named more than one course):

Linear Algebra - 6

Discrete Math - 5
Introductory Stats - 5
Finite Math - 3
Calculus III - 3
Math for Elementary Ed - 2
Calculus for Technology - 1
Pre-calculus - 1
Computer Science - 1

Although some courses were suggested more often than others, the above list is not intended to imply a true ranking of perceived need.

6. Opportunity to Comment Further

"Please comment further on aspects of the CCC, if you wish."

Some comments:

- Excellent transfer tool!
- The CCC guidelines for science calculus correspond very closely to what we are already doing.
- Great job!
- A valuable resource for establishing new transfer courses at institutions.

C. Conclusions and Recommendations

1. Conclusions

- ◆ Those departments that are active in the BCcupm report full awareness of and accessibility to the Core Calculus Curricula.
- ◆ For a large majority of departments, the outline format chosen by the working committee is suitable for their purposes.
- ◆ The CCC have been used, both directly and indirectly, by some institutions in making course transfer decisions, and, by others, in modifying or designing courses for their institution.
- ◆ As for any present need to modify the CCC, no "flag" has been raised in this regard.
- ◆ Some expressed comfort in the knowledge that the CCC recommendations called for a regular review of the CCC, but stated that no reasons for a re-visitation of the outlines are evident at this time.
- ◆ As to other mathematics courses that might benefit from having an established core, a significant majority of respondents named a variety of such first- and second-year mathematics/ statistics courses.

- ◆ Overall, a strong feeling of gratitude and support for the CCC initiative was both implied and expressed.

2. Recommendations

The BCcupm is urged to consider the following recommendations:

- a) **That the BCcupm routinely make the status of the Core initiative a discussion item at its meetings.**

Rationale: With the frequent turnover of representatives from institutions to the BCcupm and of individuals taking on course transfer duties in departments, it is wise to find ways to inform and remind the mathematics community of the existence and thrust of the CCC guidelines. Keeping the CCC "on the table" would act as a reminder to suggest modifications when these are appropriate.

- b) **That a study be undertaken to determine the system-wide level of interest in the development of core curricula in specific first- and second-year mathematics/statistics courses.**

Rationale: Some mathematics courses are widely taught and others are found only at a few institutions. The adoption of a set of core topics is most beneficial for courses that exist system-wide, and is appreciated more by the smaller institutions than by larger ones. Determining whether there are other courses that would welcome a core curriculum and, if so, which ones are considered to have the highest priority appears to be worthwhile in light of this cursory study.