THE BRITISH COLUMBIA COMMITTEE ON THE UNDERGRADUATE PROGRAM IN MATHEMATICS AND STATISTICS

MINUTES OF THE 85th MEETING, MAY 15 – 17th, 2007

TUESDAY, MAY 15, 2007

1. **WELCOME**
   Terry Weninger, interim president of Yukon College, welcomed the BCcupms to its 85th meeting.

2. **ADOPTION OF THE AGENDA FOR THE 85TH MEETING OF THE BCcupms**
   The Agenda for the 85th Meeting was approved by consensus with the following additions: 6.0 Yukon Ministry of Education, on Tuesday's agenda, and 5.1 Notification and Due Process for Articulation of Courses under New Business on Wednesday's agenda.

3. **ADOPTION OF THE MINUTES OF THE 84TH MEETING, HELD AT THE UNIVERSITY OF VICTORIA**
   The Minutes of the 84th Meeting were approved by consensus as posted on the BCcupms Website.

4. **ANNOUNCEMENTS**
   4.1 Notice of Elections: At this meeting, elections for Secretary and for Vice-Chair of the BCcupms will be held. These positions have two-year terms. Malgorzata Dubiel and Wesley Snider volunteered to coordinate nominations.

   4.2 Conferences: Rob Sidley announced the BCAMT Fall conference which will be held at Cambie Secondary in Richmond on October 19, 2007.

   Malgorzata Dubiel announced the 9th Annual Symposium on Innovative Teaching at SFU, May 23 – 24. Discussions will focus on Q-courses, and will feature plenary lectures from Peter Taylor and Kay Somers. She also informed the committee about another CMS Mathematics Education Forum which will be held in Vancouver, April 30 – May 3, 2009. Requests for project submissions for the latter will be posted soon.

   4.3 Attendance Lists: Jim Bailey circulated the attendance lists.

   4.4 Announcements from the host, Tim Topper: Tim passed on information about computer access and meeting logistics.

5. **BC COUNCIL ON ADMISSIONS AND TRANSFER (AND RELATED TOPICS)**

   5.1 New BCCAT Website—Mike Winsemann

   David Leeming introduced Mike Winsemann, Transfer and Technology Coordinator for the BC Council on Admissions and Transfer. Mike discussed a number of current initiatives being undertaken by BCCAT (see 5.2) and demonstrated the features of the new website (www.bctransferguide.ca). Highlights of the new site include: easier access, daily updates, a harmonised look and feel, increased flexibility in search options, programme specific transfer guides (including transfer grids and institution specific transfer notes), and access to MyEdPlanner. MyEdPlanner allows users to create a customised website, accessible via a login and password. Searches can be saved and accessed again, and are dynamically updated. Print versions of the transfer guide are no longer published, however periodic pdf versions of the transfer guide are made available for printing.

   BCCAT is also making an effort to market the use of this site via school visits, fairs, bus ads, and presentations to school boards, counsellors and teachers.

   It was noted as part of the discussion that UBC and UBC(O) might have different transfer arrangements, and so are listed separately in the transfer guide.

5.2 Other BCCAT Initiatives—Mike Winsemann

- Degrees offered by non-AUCC members are often not recognized for graduate-level work in other provinces. The Pan-Canadian Consortium on Admissions and Transfer (PCCAT) has been formed to discuss common issues and to attempt to resolve issues related to student mobility between provinces.
- A recalibration of the BC Transfer System is underway which will deal with concerns about the blurring of the current distinction between sending and receiving institutions.
- Private institutions have been able to offer degrees (with Ministry approval) since 2004, and have been eligible to articulate courses as receiving institutions after signing BCCAT's Letter of Assurance which outlines expectations of membership. Lansbridge University's articulation privileges were revoked May 1, 2007 signalling a need for revision to the private institution policy. Changes to the policy include the implementation of a 3-year probationary period, and requirements to report to BCCAT on an annual basis, to provide clear and accurate info about transfer arrangements and to inform BCCAT if they come under investigation. They are expected to engage in articulation and transfer processes as sincere members of the BC transfer system and may be suspended if they do not adhere to the principles and guidelines. The full policy can be viewed at www.bccat.bc.ca/pubs/private.pdf. Leo Neufeld recommended that there be communication with relevant chairs of articulation committees, so that they know which institutions have become members. Mike agreed that this could be done, but also noted that in many cases institutional membership is programme specific and so would not always be relevant to all articulation committees.
- BCCAT is working through the implications of the recommendations made in the Campus 2020 document.
- The Education Planner website www.educationplanner.bc.ca has been created to bring programme information from across the province together into one place, allowing students to see what is available and easily compare options. This site is linked to MyEdPlanner, and allows for searches based on many different criteria as well as offering a budgeting tool.

Mike can be contacted at mwinsemann@bccat.bc.ca.

5.3 Articulation Committee Membership—Jim Bailey

Jim brought up two key questions about membership on the Mathematics articulation committee: Who should be invited? and, How should we handle situations when those who should attend do not?

After some discussion it was agreed that those institutions which offer mathematics or statistics courses (including business statistics) that appear in the BC Transfer Guide should be invited to the annual articulation meeting.

ACTION: BCCAT (Mike Winsemann) will provide the Chair of the BCcupms with a list of institutions to be invited to the articulation meetings.

A number of points arose involving the issue of non-attendance. Public institutions are funded by the Ministry to send representatives to articulation, and so attendance is expected. For private institutions, participation on articulation committees is part of the requirements of their involvement with BCCAT and the BC transfer system, although the requirement is not so specific that it requires them to send a representative to <u>all</u> articulation committees relevant to their courses. It was noted that some institutions are too new or too small to be able to send reps to all committees. There was concern that the meeting provides a forum for resolution of transfer disputes and this could be problematic if the institution(s) involved did not attend.

Possible consequences for non-attendance were discussed including designating institutions as "inactive" and sending letters to the institution and/or BCCAT.   A straw poll indicated that roughly ¾ of the committee was in favour of contacting those institutions who do not attend the annual meeting, in hopes that this will help the department(s) to acquire funding and to emphasize the importance of involvement on the committee.

ACTION: Each year following the meeting, the Chair or Vice Chair of the BCcupms will send a letter to the president of each institution that did not send a representative.

ACTION: The Secretary of the BCcupms will ensure that the Minutes identify those institutions who do not attend, as well as those who do not send a report.

ACTION: It was also recommended that those institutions who are unable to send a representative in some years submit a report in advance of the meeting (and possibly a response to the Minutes following the meeting) in order to show their continued interest in being involved.

Susan Milner noted that there are other voting members of the committee who are obliged to attend, including the Ministry of Education, BCCAT and the BCAMT. Richard DeMerchant from the Ministry had intended to be at the meeting but had to cancel at the last minute. A question was raised about whether we should we have someone from the Ministry of Advanced Education in attendance, but it seemed that the information that such a representative could supply would likely be limited to funding issues.

5.4 Flexible Pre-Major in Mathematics—Leo Neufeld

Leo gave a brief history of the Flexible Pre-Major Project and reviewed the recommendations which were brought to the meeting of the BCcupms last year. The project created a grid of core courses (including Calculus I, II and III, Linear Algebra, Discrete Math I, Introductory Analysis, and Computer Science I and II) along with a listing of additional courses that students should take in order to prepare for a Mathematics Major at the universities. The recommendations of the project team were accepted at the last articulation meeting and were forwarded to BCCAT.

Jennifer Orum, Project Coordinator at BCCAT, approached Susan Milner and Leo Neufeld about taking these recommendations to the next step. This would involve moving from the recommendations of the report to the creation of a formalised flexible pre-major programme.   As the committee discussed the possibility of such a formalisation, two key objections arose:

- Receiving institutions would have to agree on the content of the flexible pre-major programme. This would be difficult given the large number of math prerequisites that are required to get into third-year courses. These vary because of the different mathematics streams that are offered at higher levels at the different universities. These prerequisites could not be by-passed even if there was a block-transfer arrangement.
- The number of Mathematics Majors in the system is small and it is unlikely that smaller institutions will be able to offer the full package of courses, especially those at the second-year level.

Members of the committee agreed that the original project had attained the desired outcomes. The course-grid provides leverage for sending institutions to acquire funding to offer a greater range of mathematics courses, where it is feasible, and receiving institutions are able to accommodate students on an individual basis, finding flexible ways to deal with transferees who may only be lacking one or two courses. Provided that sending institutions announce major programme requirement changes in a timely manner, this system should work well.

It was generally agreed that it would not be appropriate to create a formal block-transfer programme for math majors at this time. However, it would be useful to have information about the flexible pre-major course grid available to students on the BCCAT website.

ACTION: Leo Neufeld, Wayne Matthews and David Leeming agreed to form a subcommittee to review the information provided in last year's report. They will ensure that the information is up to date and will put it into a format that will be appropriate for publishing on the BCCAT site. This information will need to be reviewed annually to ensure its accuracy.

6. HIGH SCHOOL TO POST-SECONDARY TRANSITION

6.0 Yukon Ministry of Education—Paula Thompson

Paula Thompson gave a brief summary of the progress of the WNCP curriculum to date. The Grade 10 – 12 curriculum was recently available for public consultation via an online survey, and now modifications are underway based on feedback received. It is expected that this phase should be completed by late August. Final results will be available after translation (into French) by Fall 2007 or early 2008. The implementation schedule for the curriculum is:

<div align="center">

September 2008—Kindergarten, Grades 1, 4 and 7
September 2009—Grades 2, 5 and 8
September 2010—Grades 3, 6, 9 and 10
September 2011—Grade 11

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<div align="center">September 2012—Grade 12</div>

Wayne Matthews asked about the level of response to the online survey. Paula indicated that there were a fair number of responses from teachers, but not many from parents and other groups. Members of the BCcupms found the survey to be extremely large and difficult to get through. A show of hands indicated that most members present had been unsuccessful in completing the survey despite their high interest in the content of the curriculum. This means that at this stage of revision, it is unlikely that the views of mathematics departments are being represented. Rob Sidley mentioned that feedback was also obtained from focus groups that were able to spend time going through the curriculum carefully. He noted that such groups tend to identify the same concerns that arise from broader surveys.

Concern was expressed about the new names suggested for the different streams, as well as the absence of conics in the Grade 12 curriculum.

6.1 Response to Curriculum Changes: Student Preparation and the Mathematics Proficiency Report—Jim Bailey

Jim Bailey reminded the articulation committee about the Mathematics Proficiency Report, published in 1999, which established a list of proficiencies that mathematics students should have in order to be prepared for post-secondary mathematics study. These proficiencies were rated based on importance. He then presented an analysis of how these proficiencies relate to the proposed new high school curriculum.

Before getting into specifics, Jim observed that "fit" in topics is not enough to guarantee success at university. The Proficiency Report includes an emphasis on general skills, including problem-solving, logical thinking, positive attitudes, etc. These do not appear as explicit learning outcomes in the new curriculum. Rob Sidley noted that these objectives do appear in the Philosophy sections of the new curriculum, however the learning outcomes and achievement indicators need to be measurable, and so it is difficult to include items like student attitudes as specific learning objectives. Malgorzata Dubiel countered that the current grade 10 exams do not test these general skills—the exams are set up for efficient marking and not critical assessment of skills. This dictates how the course is taught and perceived. It would be beneficial if the grade 10 exams could reflect the importance of the general skills.

There was general discussion about some of the challenges related to improving students' general mathematics skills:
- Public and parental attitudes towards mathematics: Jason Diemer mentioned a Family Math programme which involves parents of young children in simple, fun, mathematics workshops. Robb Fry suggested that better books about math are needed for children, and that members of the committee should consider becoming involved in the writing of such books.
- Retention of skills as students progress through the curriculum: Once a unit is completed students often do not revisit the topics covered and so forget them. A greater integration of topics would be beneficial; at least to the extent that once topics are learned they can be used on an ongoing basis.
- Misuse of calculators in early grades: This robs students of valuable number sense skills.
- The education system: Students get pushed on before they are ready in the current system, and the semester system may be a problem for some.
- Assessment tools: Current assessment techniques often do not test for the general skills that we want students to demonstrate.

Jim then presented a comparison of topics between the Proficiency Report and the proposed WNCP curriculum. A number of recommended topics are missing in the new curriculum, including: real exponents, simplifying radical expressions with indices other than 2, solving systems of linear inequalities, systems of three equations with three unknowns, inequalities containing rational expressions, formulas for areas of triangles using trig ratios, conics, common logs, and phase-shift in trigonometric graphs. Many of these missing topics were given relatively low importance ratings in the Proficiency Report. Some proficiencies could not be matched with specific learning outcomes, though they were still integrated into the curriculum. The curriculum also included some objectives that were not in the proficiencies list. A large number of the proficiencies are found in the grade 10 curriculum. Rob Sidley commented that this may be the case because students will not choose a stream of mathematics until they reach grade 11, and that despite how it appeared, there is less in the new Math 10 curriculum than there is currently.

The committee thanked Jim for all of the work that went in to preparing this report. It was agreed that this information would be useful input to the WNCP committee as they consider their final revisions.

ACTION: Jim Bailey will send his report to Paula Thompson who will bring it to the next meeting of the WNCP committee. He will also send a copy to Leo Neufeld for posting on the BCcupms website.

6.2 Optional Math 12 Provincial Final Exams

At last year's meeting concern was expressed about making the provincial Principles of Math 12 final exam optional. Susan Milner opened up discussion on the current expectations regarding the final exams at our institutions.

Rob Sidley added to previous concerns by reporting that an increasing number of students are now opting to take PM12 through distance ed courses which are available through the Ministry. These courses are all assessed at a distance and the final grade is not identified as distance ed. The Ministry is looking into this as there are concerns about legitimacy of the on-line school grades. Some schools have as many as 20 – 25% doing the course on-line.

Institutions that no longer require the provincial final in order to access their mathematics courses include: Camosun, North Island, Kwantlen, BCIT, Capilano, Vancouver Community College, Northern Lights, North West, Columbia, Thompson Rivers University, College of the Rockies and Trinity Western University.

Simon Fraser and UBC currently require the final exam, though UBC may not continue to do so.

For UVIC, students must have three provincial finals for admission, but this does not need to include Math. All students who do not have an A in PM12 must write a placement exam. Placement tests are also available at Capilano College, SFU, Trinity Western, Columbia, Langara, Northern Lights, and UCFV. These allow students who do not have the provincial final to access Calculus courses.

A number of institutions indicated that the status of the final exam is still under review, including: UCFV, Langara, Yukon, Okanagan College, College of New Caledonia, Douglas, UVIC, and UBC. In many cases the departments would like to continue to require the exam, while their administrations are leaning towards dropping it. It was noted that if UBC decides not to require the final exam, it is likely that most other institutions will no longer require it either.

Tim Topper observed that within a few years of eliminating the final exams in Ontario, grade inflation was rampant, and universities introduced scaling factors to adjust final grades for different schools. University Entrance Exams were suggested as another way that this could be dealt with.

Nora Franzova, Wayne Matthews, Deanna Baxter and Wayne Nagata formed a working group to compose a motion to be presented at the Wednesday plenary session.

The Tuesday Session of the BCcupms adjourned at 3:58 p.m.

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BCCUPMS and Secondary School Teachers Session

1. Introductions and Opening Remarks

We welcomed Marie Daniels from F.H. Collins High School to our Secondary School Teachers Session.

2. Reports

2.1 BCAMT – Robert Sidley

Rob Sidley gave his report from the BCAMT. Feedback was recently provided to the Ministry on the Grade 10 – 12 curriculum draft. The BCAMT supports the direction of the new model, which provides students with the option of three pathways at the grade 11 level. They are also taking a look at the new resources which are available for the new K – 7 curriculum, and are finding that the new textbooks are quite different. As well, the issue of the optional PM12 provincial final continues to be a hot topic.

Rob was optimistic about the coming year for the BCAMT. Membership numbers are still down in the aftermath of the recent job action; however attendance at the Northwest Conference in Victoria was strong. A new executive will be taking over soon, with Michelle Roblin as president.

Current initiatives underway include collaboration with the Ministry on Gr. 8 – 12 standard-setting, and efforts to increase the numbers of workshops offered on numeracy, conceptual understanding, evaluation, etc.

When asked to comment on projected enrolments and demand for teachers, Rob noted that enrolments were expected to drop by 20% in British Columbia over the next 10 – 15 years, but that retirements should keep pace. Some schools will still be closing and be consolidated. He observed that fewer math specialists are coming out of teacher education programmes, and that this could be a concern if those who end up teaching math do not think of themselves as mathematics teachers.

2.2. BC Secondary Schools Mathematics Contest – Clint Lee (see attached report, page 24)

2.3 BC Universities' Calculus Challenge Exam – Malgorzata Dubiel and Wayne Nagata

Malgorzata Dubiel reminded the committee of the existence of the BC Universities' Calculus Challenge Exam, which was implemented as a (less expensive) BC alternative to the Calculus AP exam. Students can get credit and a grade for Calculus I at BC Universities. The exam is coordinated alternately by SFU or UBC, and will be done by UBC in June of this year. Students are able to take the exam in their own school. Past exams are posted on the mathematics department websites of both institutions. For SFU the site is www.math.sfu.ca/outreach/schools/challenge/ and for UBC it is www.math.ubc.ca/Ugrad/Challenge/

The number of students who attempt the exam are consistently low. In 2006, 201 students wrote the exam. Of these, 22% earned 75 – 100%, 46% earned 50 – 74%, while the remaining 32% scored 12 – 49%. The failure rate is quite high, however students do not need to accept the grade they are given, and the writing of the exam is a good experience for students regardless. Out of 1600 first-year calculus students at UBC, only about 20 opt to use their challenge exam score as their grade.

3. **General Discussion**

   3.1 **Provincial Exam Optional for Grade 12**

   Susan summarised our earlier discussion of the provincial exam issue.

   Concern was expressed about the motivation for the change in status of the Principles of Math 12 exam. If the intent was to encourage more students to take PM12 by removing the pressure of writing a final, this does not seem to be happening. Students are using time off to prepare for the final exams in courses that still require them. At the same time a number of universities are lowering the number of Grade 12 courses required for admission.

   3.2 **Graphing Calculators in Calculus Classes**

   Marie Daniels asked about the extent to which graphing calculators are used at the various post-secondary institutions.

   The large universities do not allow students to use them in exams. With their very large class sizes, monitoring calculator use is not practical. There are also concerns that students can use the graphing calculators to answer questions without really understanding what they are doing. Of the remaining institutions, a show of hands indicated that roughly half do allow students to use graphing calculators.

   A follow-up question on the use of Maple was asked. Eight institutions use it in their first Calculus course, though only a couple evaluate its use in a lab setting. SFU has some instructors who use Maple as part of their course, but it is not standard. Langara offers one Calculus course based on Derive.

5. **Adjourn to Reception.** The session adjourned at 5: 17 p.m.

WEDNESDAY, MAY 16, 2007

Mathematics and Statistics Subcommittee Sessions (held concurrently)

MATHEMATICS SESSION

Math1. Pre-calculus courses

1.1 Changing the Culture Conference Discussion—Nora Franzova

Nora Franzova gave a brief summary of the workshop entitled "Rethinking Precalculus Mathematics" which was part of the programme at this year's Changing the Culture Conference. The workshop was led by Sue Harberger (SFU/Coquitlam College), Petra Menz (SFU) and Jamie Mulholland (SFU), and addressed the question of whether or not precalculus courses prepare students for Calculus. Not surprisingly, the need to "change the culture" arose as part of the discussion. There is no doubt that students need basic routine skills, but presumably these things are covered in the high school curriculum and are not retained. Some suggestions for improving precalculus courses included improving assessment tools, focussing on new material as opposed to review in order to inspire students, and finding ways to motivate students to do homework.

1.2 Courses and Enrolment Trends

Susan Milner asked representatives to report on the precalculus courses offered at their institutions. Specifically she asked about what types of courses are offered and whether there had been any recent changes in enrolment trends.

- **College of the Rockies** (Jim Bailey) offers a precalculus course that starts with only a few students but is augmented in Week 5 by students dropping down from Calculus I. It usually ends up with about a dozen students, and although this had been steady for a number of years, it did not run last year.
- **Langara College** (Nora Franzova) offers two precalculus courses: precalculus algebra and precalculus math. The level of the second course is higher, containing one month (as opposed to one week) of trigonometry. Upon completion of precalculus algebra students can access their slower 3-semester calculus stream. With a B- (formerly a C+) in the precalculus math course students can access the 2-semester calculus stream. Approximately 20 sections of these courses are offered each year combined. Numbers were higher in 2003/3004.
- **Thompson Rivers University** (Robb Fry) offers a couple of sections of a regular precalculus course for 35 – 40 students each term. Many students take it who need a math course, but are not necessarily headed for calculus.
- **Okanagan College** (Clint Lee) offers face-to-face precalculus courses at all of its campuses, as well as an on-line course. There are more students enrolled in Precalculus in Vernon than in Calculus. This is likely because of good counselling. They also allow students to drop down early in the semester if they are not succeeding in Calculus. The numbers in the on-line course are now down to 2 – 5 students since face-to-face offerings have become more available. Otherwise enrolment trends are hard to see, given the recent changes in at OC.
- **Columbia College** (Peter Hurthig) is offering only one section this summer, which is surprising. Usually 1/3 of their first year students will take precalculus based on an entry assessment.
- **Northwest Community College** (Mona Izumi) has only offered precalculus a couple of times, once in an on-line/mixed mode format.
- **Capilano College** (Wendy Lynn) offers two different precalculus courses, one for business students and one for science students. The courses differ in the amount of trig covered, but the same text is used for both. They ran 4 sections of the science stream course in Fall 2006, 3 in Spring 2007 and are offering one in the Summer. For the business stream they ran 2 sections in Fall and 1.5 in the Spring. Enrolments are dropping across the college, but they have not observed huge differences in the number of precalculus students. Students are also able to drop down into precalculus if Calculus is not going well, but few take the opportunity.
- **College of New Caledonia** (Nicholas Buck) offers one precalculus course. At one time they ran 4 classes of 37 students. It was popular with international students as it had a lower language requirement. Fewer sections are being run now.
- **Northern Lights College** (Hongbin Cui) has not offered precalculus for a while, but plans to offer a section in the Fall.
- **Douglas College** (Wesley Snider) offers two different precalculus courses, one 6-hour per week course for science stream students, and one 4-hour per week course (called Algebra & Trigonometry) for business students or those students who need a course that is roughly equivalent to Math 12 for entry into other programmes. They run 3

sections of Precalculus in Fall and Winter, and 1 section in the Summer. Two sections of Algebra & Trig run each of Fall and Winter, though they have not been full. Enrolments took a hit over the last few years, but seem to have stabilized.

- **University of Victoria** (Jill Simmons) offers a precalculus course for those students who do not have an A in PM12 and who do not score high enough on the assessment test. They run three sections in each of Fall and Spring with about 200 students. The course is also taken by Psychology students who want to take one of two third-year stats courses, but whose Math 12 grade is more than five years old.

- **Vancouver Community College** (Costa Karavas) has started to offer precalculus in the last year and a half to those students who do not have an A or B in PM12. They have offered one section per term (not in the Summer) with about 15 – 20 students each time, but they expect the numbers will grow as word of the course gets out.

- **Yukon College** (Tim Topper) offers 1 section of precalculus each semester with approximately 17 students. (One term they had 32!) Enrolments have declined, and their students are getting younger. The withdrawal rate is about 16%.

- **Selkirk** (Ross Bates) offers one precalculus course, and their ABE department does one as well. The ABE version is tuition-free. Only 12 students took the regular precalculus course this year, while there were 30 in the ABE course. They expect enrolments to increase this year with their increase in prerequisites for their Calculus course from a C to a C+ in PM12.

- **Kwantlen** (Michael Nyenhuis) offered 23 sections of precalculus last year. Most were close to full with 25 to 30 students each. Enrolments have dropped, but they have dropped overall.

- **Coquitlam** (Gera Belchev) has dropped their Business Precalculus course because SFU no longer accepts it for transfer. They offered two sections of science-stream precalculus in Fall and Spring and are offering one section this summer. Most of their students transfer to UBC, and since UBC does not award transfer credit for this course, students are reluctant to take it.

- **Trinity Western University** (Richard Atkins) offers one precalculus course for business students and one for science students. They typically run one section of the former and 4 sections of the latter.

- **Simon Fraser University** (Malgorzata Dubiel) has offered precalculus for many, many years. They are currently looking at ways to improve the course as it doesn't work very well for weak students. Enrolments have decreased slightly.

- **University of British Columbia (Vancouver)** (Wayne Nagata) has a precalculus course but it is taught by the department of continuing studies, not the Mathematics department. He was uncertain about enrolments.

- **North Island College** (Jason Diemer) has a new precalculus course that it has not run yet. In the past, students who did not do well on an assessment were referred to ABE courses. The ABE option will likely still be preferable as, with current scheduling, there will be a break between when students take precalculus and when they will be able to take calculus.

- **Camosun** (Wayne Matthews) has two precalculus courses, one lighter than the other but with both finishing in the same place, and both receiving transfer to Math 120 at UVIC. They usually run 10 or 11 sections per year. They have noticed that enrolments are down somewhat and that students are coming in with lower skills. They have also introduced a precalculus course for business students, which will cover the same topics, but will have reduced rigour.

- **University College of the Fraser Valley** (Susan Milner) has noticed increased enrolments in their precalculus course. Weaker students seem to be coming in. They have also developed a new precalculus for business course which students who are heading into a UCFV Business programme can take. They have raised the prerequisite from a C- to a C in PM12, as too few of their students were doing well enough in precalculus to go on to Calculus.

It will be interesting to see what the effect of no longer requiring the provincial Math 12 final exam will have on courses of this type.

Math2. Math for Liberal Arts

Susan Oesterle gave a brief summary of the new course they are offering at Douglas College called Mathematics for Liberal Arts. The course is targeted at non-mathematics students. Its aim is to develop their quantitative reasoning skills, while deepening their appreciation for the power and beauty of mathematics. They have offered the course three times so far: in Winter 2006 (13 students), in Fall 2006 and Winter 2007 (both full with 28 students each). Topics covered by the course include: some basic logic and critical thinking, sets and Venn diagrams for problem-solving and organisation of information, fractions, units and unit conversions, percentages, understanding large numbers, how numbers deceive, some basic statistics, reading and creating tables and graphs, correlation and causality, math in music, basic geometry, perspective, symmetry, proportion, the golden ratio, linear and exponential growth, as well as savings, loans and credit cards. The text being used is "Using and Understanding

Mathematics—A Quantitative Reasoning Approach" by Bennett and Briggs, published by Pearson. The book offers a wide variety of mathematical topics and is very good at relating these topics to the real world.

The course has university transfer to Simon Fraser's Math 197, Hitchhiker's Guide to Everyday Math, as well as unassigned first-year credit to Malaspina and UCFV. It is a good option for students who require a Q-course for Simon Fraser programmes, and satisfies the Math requirement for the Associate in Arts degree. As well, the course has been added to the list of required courses for students enrolled in Douglas College's new Bachelor of Physical Education degree programme (secondary option), and is a perfect course for a first-year Arts Connections programme which will offer a cohort of students a thematically linked package of courses (English, Math for Liberal Arts and Geography). As a result, Douglas College will offer three sections of Math 1234 in the Fall.

The course involves a fair bit of writing, including personal reflections, applications of the course to newspaper articles, and a movie review. Students are also expected to give a short presentation on a mathematical topic of their choice. Teaching the course is challenging, but rewarding. It is a wonderful opportunity to push forward our agenda of "changing the culture".

Other institutions that offer mathematics courses to arts students include: SFU (Math 197), UBC (Math 230, taken by both elementary education students and general arts students, and TRU (a Math for Visual Arts course). Kwantlen has a Math Explorations course which they offered two years ago, but they did not have enough students to run it this year.

Math3. Math for Elementary Education—Malgorzata Dubiel

Malgorzata Dubiel summarised the workshop on Math for Elementary Education that took place at this year's Changing the Culture Conference.   The work done was a continuation of last year's discussions at the articulation meeting, and a meeting held at SFU in November. The main topic addressed was the content in MFEE at institutions across the province. Susan Milner compiled a summary of this information for the workshop. It was noted that the course was created 20 years ago and there was a sense that the time has come to rethink it. The course is over-packed and often fails in its objective of changing student attitudes. Participants were asked to come up with a list of 3 things that must be in the course, which could provide a starting point for future course revision.

Members of the BCcupms (or their colleagues) who are interested in this course were invited to sign on to the MFEE list serve, by contacting Geoffrey Salloum at salloumg@camousun.bc.ca.

There was general consensus that a task force should be formed to work on the revision and revitalisation of this course. Some level of common practice would be desirable, as students are currently shopping for grades amongst institutions. The details of this were deferred to the Thursday Professional Development Session.

[ADDENDUM: At the Professional Development Session on Thursday, May 17 the Math for Elementary Education Core Curriculum Subcommittee was struck. It consists of a core steering committee (Susan Milner (UCFV), Malgorzata Dubiel (SFU), Susan Oesterle (Douglas), Wendy Lynn (Capilano) and Wayne Matthews (Camosun)), which forms a subset of a larger advisory committee (including Mona Izumi (North West), Nicholas Buck (New Caledonia), and representatives to be named from UVIC, Okanagan College, and Langara). Meetings will be set to ensure that the steering committee members can attend, but will be open to all, and participation in the process via the list serve will be encouraged. The possibility of funding through PIMS or SFU will be looked into by Malgorzata Dubiel.

The mandate of the committee is:
1. **To explore the issues surrounding the development of effective Math for Elementary Teachers courses, by consulting various groups, including teachers and math education specialists.**
2. **To produce a statement of objectives for Math for Elementary Teachers course(s), and make recommendations for course prerequisites and texts.**
3. **To make recommendations for next stages.**

The committee will report on its findings at the 2008 BCcupms meeting, and at the CMS Mathematics Education Forum in 2009.]

Math4. Math for Business and Economics

A survey was conducted of the types of math courses that are being offered for Business and Economics students. The following table gives a breakdown of the number of institutions that offer each type of course and which department is offering it.

Course	Math Dept	Busn Dept
Precalc	4	0
Calc I	16	1?
Calc II	8	
Busn Math	4	9
Stats	6	8
Finite Math	7	
Other		
Combined Calc & Busn Math	1	

It was also noted that: Okanagan College offers a 3rd year calculus course for business students; at North West Community College business math courses are being taken over by the Business Department; and UCFV is looking at restructuring their offerings.

Because only the Economics Department at UBC continues to require a second semester Calculus course, the demand for Calculus II has dropped.

Math5. Textbooks—Nicholas Buck

Nicholas Buck raised concern about the rising costs of text books and recommended that we take steps to try to help our students. The new textbooks being produced are too long, too glossy, and contain too many extra features that students don't need. Furthermore, editions change frequently with only minimal changes.

Suggestions for dealing with this problem included:
- Adopting stream-lined books like Stewart's "Essential Calculus"
- Creating a black-list of publishing companies who change editions too frequently
- Asking the company to issue the text as a black-and-white coursepack
- Adopting texts in e-book format (but usage is often time-limited)
- Using Schaum's Outlines
- Not requiring a text at all, or providing students with a booklist with suggested but optional titles
- Warning publishers that whenever their book goes to a new edition, an open search for a replacement will be undertaken

As part of the discussion committee members were reminded that students are now able to buy full solutions manuals for popular texts on the web, and should keep this in mind when assigning homework.

    STATISTICS SESSION

Stats1. Approval of Agenda

Stats2. Approval of Minutes from Statistics Subcommittee Meeting from 84th Meeting

Stats3. Matters Arising from the Minutes

Stats4. Articulation and Transfer Issues
    4.1 Good practice from "sending" and "receiving" institutions

Stats5. Future Developments

Stats6. Institutional Reports

Stats7. Math 10 – 12 Curriculum Revision and Provincial Exams

Stats8. Statistics Resources on the Web—Veda Abu-Bakare, Langara College and Thompson Rivers University Open Learning Institute

Stats9. Other Business

Stats10. Motion to Adjourn

Plenary Session

1. OPENING REMARKS

1.1 Introduction of representatives

1.2 Announcements from the host
Tim made announcements about dinner and transportation logistics.

1.3 Attendance lists
Jim circulated the attendance lists.

1.4 Sign-up sheets
Susan Milner invited members to set up their final exam request sheets on the table provided.

2. CORRESPONDENCE

Susan Milner and Bruce Dunham invited representatives from the University of Alaska to attend the articulation meeting. Faculty from Juneau had expressed interest in coming, but in the end were unable to do so.

3. REPORTS

3.1 ABE—Costa Karavas

The ABE articulation meeting was held at Kwantlen University College, March 1-2, 2007.

Articulation Guide

The guide contains transfer information (course numbers for equivalent courses at different institutions) and the learning outcomes for all our courses. There is also a list of members of the ABE math working group and their institutional contact information. See http://www.aved.gov.bc.ca/abe/handbook.pdf

Presentations

- **Learning Programs Branch, Ministry of Advanced Education,** by Bonnie Wai
Adult Literacy is a top priority for the Ministry of Advanced Education (AVED), which supports government's great goal to make British Columbia the best educated and most literate jurisdiction in the country.

    AVED is developing a comprehensive Adult Literacy Action Plan. Some of the programs and initiatives to improve adult literacy are:
    i)   Development of a database of services to allow increased efficiencies and information sharing between service providers and practitioners.
    ii)   Development of a Workplace Essential Skills Initiative that will increase the levels of literacy of those in the workforce.
    iii)   Promotion of greater coordination and collaboration in the delivery of Adult Basic Education (ABE) opportunities in the K-12 and post-secondary systems across the province.
    iv)   others

- **Presentation by Geoff Dean, Kwantlen University College:** ALEKS (Assessment & Learning in Knowledge Spaces).

- **Presentation by Dr. Peter Liljedahl, Associate Dean of the Faculty of Education, Simon Fraser University**.
    Theme: "Learning and Teaching Mathematics".

Articulation of new and existing courses

i)   Math 084 & 086 from Okanagan College were articulated at the grade 11 level (advanced level).
ii)   Conic sections in the grade 12 level (provincial level) were changed from core to optional topic.
iii)   The Business/Technical math will be reviewed to expand it to include more optional topics.

Other Articulation Business and/or Discussions

- **Specialized Math Courses for Trades and Other Areas.**

- **Discussion on "Valid Indicators of Success for ABE Students?"**
There were a variety of indicators of success and they were not the same for all students. Successful entrance into other programs was thought to be the most common one. It was noted that many students take ABE courses concurrent with UT courses.

3.2 AMATYC—Slava Simice
Slava was unable to attend the BCcupms meeting and so did not give her report on AMATYC.

3.3 PIMS—David Leeming

3.3.1 Associate Status for Colleges and University Colleges
David Leeming distributed a handout with a Proposal to Allow Alberta and BC Colleges Special Affiliation as PIMS Education Associates. The affiliation would give institutions the opportunity to access PIMS information and resources for mathematics education endeavours. The exact cost of associate membership was not specified in the agreement. The fee would be negotiated on an institutional basis, but should be nominal ($500 - $1000). David encouraged institutions who are interested in becoming involved to speak to their CEOs about joining.

Several institutions expressed interest, but asked for more information on what the benefits of membership would be. David referred the committee to the PIMS website which will have detailed information about what is available.

3.3.2 Education Outreach Activities
PIMS continues to be engaged in a number of exciting Math outreach programmes, including:
- Math Mania (which now has a website)
- Math Circles (a programme for gifted high school students—challenging math problems + pizza)
- Pi in the Sky magazine (available to member institutions for their students)
- Changing the Culture Conference
- Math Camps for High School Students since 2001 supported by PIMS and CMS at SFU
- A conference for women in mathematics in September 2006
- An ongoing First Nations project with students in grades 5 and 6 (development of activities to increase skill levels)

3.4 Reports from Mathematics and Statistics Sessions

Mathematics Session
Susan Milner summarised the discussions of the Mathematics Session.

Statistics Subcommittee Session
Bruce Dunham summarised the discussions of the Statistics Session.

4. BUSINESS ARISING FROM THE MINUTES OF THE 84th MEETING

4.1 Core Calculus Review—David Leeming

The Core Calculus Report was approved by this committee in 2002, and at that time it was agreed that it should be reviewed in 5 years. The core calculus document provides a list of core material that should be covered in any calculus courses along with

a list of other important but optional topics. If an institution follows the guidelines set out, transfer of the calculus course developed is guaranteed. The document seems to be serving its purpose well, and there were no cries for change.

Clint Lee raised a question about the topic "Linear Differential Equations" which appears as a required topic in Calculus II. Although some institutions did include this topic (not in depth), most admitted that they stop at separable differential equations. It was not felt that this matter was important enough to revisit the entire document, but that the issue should be noted in the minutes.

Motion: (moved by David Leeming and seconded by Clint Lee)

That the Core Calculus Report be readopted by this body, and that it be reviewed again in 2012.
                                        Carried (with none opposed and 2 abstentions).

5. NEW BUSINESS

5.1 Notification and due process for articulation of courses—Wendy Lynn

Wendy Lynn raised a concern about the cessation of transfer credit status for Capilano College's Business Calculus course. They received notification in November 2006 that their course no longer transferred to UBC, effective September 2006. They were most concerned about the effective date as they had a number of students who would be adversely affected by this change in transfer status. Wayne Nagata (UBC) admitted to having simply allowed the default effective date to stand, but offered to change that date to facilitate the students affected.   Wendy indicated that Capilano will be revising its Business Calculus course in order to satisfy transfer requirements. Wendy was advised to check with her Registrar's Office and with BCCAT to find out what initiated the reevaluation of transfer in this case. It is possible that rearticulation occurs automatically at some institutions.

5.2 Provincial Final Response

The working group presented its draft motion based on Tuesday's discussion of the Provincial Math 12 Final Exams. After some deliberation the final wording of the motion was agreed upon as follows:

Motion: (moved by Nora Franzova and seconded by Bevan Ferreira)

Given that:

1. **Research* shows that students who prepare for and write comprehensive final exams have a better grasp of the material and perform better in their future math courses;**
2. **a provincial final is a more reliable tool for student placement;**
3. **lack of provincial finals will likely create entrance exams at post-secondary institutions which could lead to financial, logistic, and fairness issues for students involved;**

   we, the BCCUPMS, strongly recommend that any Principles of Math 12 course (or equivalent) must have a properly invigilated provincial exam that is mandatory.

(*"Study of the Effectiveness of the 1976 Math 12 Scholarship Exams in Predicting Math 100 Results" by George W. Bluman and Warren C. Smith, Department of Mathematics, UBC)

                                        Carried (with none opposed and 4 abstentions).

ACTION: Susan Milner will send copies of the motion to the Ministry of Education, to the Registrars of all institutions, to the BCAMT (via Rob Sidley), to George Bluman and to the BCCAT Admissions Committee.

5.2 Report of Nominating Committee for the Vice-Chair and Secretary of the BCcupms:

The committee nominated Jim Bailey for the position of Vice-Chair and Susan Oesterle for the position of Secretary. There were no other nominations.   Jim and Susan were acclaimed in their respective positions for another two year term.

6. INSTITUTIONAL REPORTS

BCIT – Colin Lawrence

Nothing to report.

CAMOSUN – Wayne Matthews

CAPILANO – Wendy Lynn

- Enrolments continue to fall.
- We are re-articulating Math 108/109 (Calc I and II for business) with UBC.
- Our High School Enrichment program was very successful. There were 3 sessions in Fall 2006 and 3 in Spring 2007. All were well-attended.
- Approximately 60 students participated in the High School Math Contest.
- Ken Towson and Reimar Hauschildt will be on paid educational leave in 2007/2008.

COLLEGE OF THE ROCKIES – Jim Bailey

- Our Physics instructor, Richard Hewko, is returning from a year's educational leave at the University of Arizona during which he wrote pre-algebra level school curriculum. Richard's replacement did not feel comfortable with our combined Mathematics-Physics format so we taught the two classes separately last year. We will use the combined Mathematics-Physics format again next year.
- Last year no students enrolled in our PreCalculus course (which is usually taught by our Physics instructor) so it has been cancelled this year. In its place we will offer the first semester of Commerce Calculus.
- Numbers are down in general; I will have volunteered to teach the second year calculus courses next year as directed studies.

COLUMBIA – Peter Hurthig

Columbia College is in the process of rearticulating Math112 (Calculus 2 for Business/Arts). Samples of the Math Placement Test and Final Examinations are on display at http://staff.columbiacollege.bc.ca/phurthig/ (Click Notes, top of list).

COQUITLAM – Gera Belchev

DOUGLAS – Wesley Snider

Our enrolments seem to have stabilised.

Pilot testing of Maple TA for our assessment testing was done in January. The results now need to be analysed to determine appropriate cut-off scores to serve as prerequisites.

We are in the process of developing an on-line introductory statistics course to assist students in the nursing degree programme to complete their math requirement externally.

We are giving our Calculus I course to a group of about 13 students at Centennial School in Coquitlam. This is in response to a request from Centennial. The students have completed both Principles of Mathematics 12 and Calculus 12. The course is being given in the same number of hours as our on-campus version and is identical to it except that the secondary school students do not get a weekly tutorial. The course commenced with the start of the public school semester and will conclude in May. Successful students will receive credit for Math 1120.

We are currently hiring to fill a part-time position for the fall semester. This is a replacement for a maternity leave.

FRASER VALLEY – Susan Milner

New first- and second-year courses

Transfer and articulation arrangements may be affected by the following:

- New in the 2007/08 calendar is Statistics and Mathematical Methods for Business, a 6-credit course for students in our BBA programme. It replaces the old requirements of Introduction to Statistics (Math 106, 4 credits) and Mathematical Methods for Business (Bus 162, 3 credits).
- We are working with the Business department to further re-structure our mathematic & statistics offerings: the proposal is to retire Differential & Integral Calculus I (Math 115) with two courses: Precalculus with Applications in Business & Calculus with Applications in Business.
- This year we offered Math for the Elementary Teacher II for the first time. This course has been highly recommended to students wishing to enter UCFV's new Teacher Education Programme. We hope that it may eventually become mandatory.

Enrolment

Overall enrolments in the fall & winter were about the same as or a little lower than last year's, while summer enrolment is substantially increased, especially at the first-year level. In the fall, Calculus I was a bit down, while Precalculus was overflowing; summer enrolment in Calculus I is very high. Introductory Statistics courses and Math for Elementary Teachers are as popular as ever. Our pair of courses that form the equivalent to PMath 12 have seen a slight decrease. For the first time ever we had enough students to run a second-year Discrete Math course, rather than offer it as a directed study. Second-year statistics courses continue to have good enrolments. Our most popular upper-level course is History of Mathematics. Other upper-level courses saw fairly stable enrolments.

KWANTLEN – Michael Nyenhuis

We will be offering a B.A. with a Minor in Math starting in September, that is, we will be offering the third year courses in this degree starting this fall. New courses for the degree will be Math 3150 The Structure of Mathematics, Math 3250 Geometry, and Math 3450 History of Mathematics. Course descriptions are on the Kwantlen website (http://www.kwantlen.ca/calendar/courses/mathcrs.html). In general, enrolments for 2006-2007 were weak. Luckily, several faculty members were on leave this year, so we could meet the difficulties by eliminating contract positions.

LANGARA – Nora Franzova

What's New:

After some analysis done during the past few semesters, conclusion was made that we need to increase the prerequisite for our Math1171 (Calculus I). The change will affect students coming from our Precalculus Math 1170 course. The previous requirement of C+ was increased to B-. It will affect students registering for Math1171 for September 2007. In similar fashion the required grade for registration into Math1173/83 (Cal I with Derive) was increased from C- to C+. No changes for our Calculus with Business Applications, yet. The main reason was that the success rate of those with C+ from Precalculus who entered Math1171 was around 50% only.

This should also help increase enrollment in Math1153/1253 (a split 2 semester Calc I course), of which we hope to offer 2 sections in the Fall 2007. (We only managed to fill up 1 section per semester for the past 6 semesters.)

The College will move Fall registration for second year students (with 33 or more registration points completed) to June; they will move Fall registration for ALL students to June starting in 2008. There are prerequisite-checking issues that arise out of this for new students, and we will need to find solutions over the next several months.

We have a new department chair: Roger Coroas and a new Core Coordinator Ken Collins.

Old/New:

In the Spring of 2008 we will for the first time offer: Numerical Analysis (Math2485) – a lab course. We also have Mathematical Modeling (2365) approved. It will be offered first time maybe in the Fall 2008. These courses would help when we offer an ASc degree in Math.

Transfer Agreements:

There have been no new transfer arrangements established this year.

Questions:

We would be interested in MapleTA for competency, diagnostic, and other testing. Would there be more colleges interested? Maybe we can get a BC license.

When other Colleges register, when do they check prerequisites? Do they have any problems with students registering in courses before prereqs are checked (eg. June) and then getting kicked out later when prereqs are checked (eg, August)? (This is a concern because of our new early registration policy.)

How is in other colleges preserved the confidentiality of assignments? How is the handover with the grader happening?

MALASPINA – Dean Slonowsky

NEW CALEDONIA – Nicholas Buck

No new courses. Down to three full-time mathematics positions in university transfer. Enrolments are slightly down in UT, but relatively stable compared to recent years. John Bowman recently appointed as President.

NICOLA VALLEY INSTITUTE OF TECHNOLOGY—Al Fukushima

Courses offered:

College Readiness
- Math 040 (Basic Math Skills) - Unsubscribed
- Math 041 (Pre-Algebra Math)
- Math 050 (Introduction to Algebra)
- Math 051 (Advanced Algebra)
- Math 060 (Provincial Level Math I)
- Math 061 (Provincial Level Math II)- Unsubscribed
- Math 100 (Precalculus Math) - Unsubscribed

Academic and Indigenous Studies
- Math 110 (Finite Math) - Unsubscribed
- Math 120 (Introduction to Statistics)- Unsubscribed

Administrative Studies
- BUSM 200 (Finite (Business) Math)
- BUSM 207 (Introduction to Statistics)

NORTH ISLAND – Jason Diemer

Enrolments in some regions are soft (e.g. Campbell River), but on the rise in others (Port Alberni). Overall, they are stable.

Math 102 (single-term applied calculus) and Math 151 (finite mathematics) are have been revived as online courses delivered using CourseCompass. Textbooks are by Lial et. al. Assignments are pencil-and-paper, as are all exams. The content of these courses is unchanged.

Math 181/182 (Calc I and II) will have contact hours reduced from 6 per week to 5 starting fall 2007 to ease timetabling.

NORTHERN LIGHTS - Hongbin Cui

Enrolments: We have experienced low enrolments in all University Transfer courses for the past two years, although we saw a slight increase in Math courses last year.

Placement Test and Pre-calculus offering: We are going to implement a placement test for Calculus I, called NLC Calculus Readiness Assessment, in September. Corresponding, Math 110 Pre-calculus, which has been inactive for a few years, will be offered.

NORTHWEST – Mona Izumi

Enrolments in Calculus I and II were down slightly this past year in both the Terrace and Prince Rupert campuses.

Introductory Statistics numbers continue to be consistent. The UNBC Nursing program in Terrace provides additional students requiring stats.

Math for Elementary Teachers continues to be taught face to face in Terrace and online to the rest of the NWCC region.

Math 103 is our newest course. It is a one-semester applied Calculus course. There is talk of it being offered within the proposed school of mining and exploration.

OKANAGAN – Clint Lee
Department Overview:

The Department of Mathematics and Statistics at the "new" Okanagan College is primarily a service course department. We teach service courses for a Bachelor of Business Administration program, a Bachelor of Computer Information Systems program and six two-year technology diploma programs. Our academic component is somewhat smaller, but we do offer a full array of first-year courses for Arts and Sciences in Kelowna, Vernon, Penticton and Salmon Arm as well as a small number of second-year courses at the Kelowna campus.

	Fall 2006	Winter 2007	Total
Academic course registrations in mathematics and statistics	295	308	603
Service course registrations in mathematics and statistics	540	263	803

We anticipate that, in the short term, this mix of service courses to university-transfer courses will continue in roughly the same ratio.

Courses:

- In the 2006/2007 academic year, we added a fourth lecture hour to Math 112 (Calculus 1) and Math 122 (Calculus 2). A student in Math 112 or Math 122 now has five hours of contact per week – four lecture hours plus a one-hour MAPLE computer lab.

- In the 2007/2008 academic year, we plan to offer a new course, MATH 314 – Calculus and Linear Algebra with Business Applications. It is intended to serve as a third-year elective in the OC Bachelor of Business Administration program.

- For 2007/2008, we have added a fourth lecture hour to MATH 160 – Mathematics for Elementary Teachers.

- For 2007/2008, MATH 225 – Differential Equations, will have a one-hour weekly MAPLE computer lab in addition to the current three lecture hours.

Faculty:

In the past academic year, over 50% of the teaching of mathematics and statistics at the Kelowna campus was done by term or part-time faculty. A major departmental goal is to convince OC senior administration to hire 3 new continuing faculty members over the next several years. We are currently engaged in hiring one new continuing faculty member in Kelowna and we expect that process to be complete soon.

On the down side, for the second time in 3 years, TRU has lured one of our faculty away. Mark Paetkau, who taught mathematics and physics at OC's Penticton campus, will join the TRU Physics Dept. as of Fall 2007. We are currently engaged in hiring a replacement for Mark.

Outreach Activities/Secondary School Liaison:

In 2006-07, the Department made a concerted effort to create new ties and reinvigorate old ties with the secondary school mathematics community in the Okanagan College region.

- The department initiated a "problem of the month", which was sent to all the secondary schools in the College region each month from October to April. School students can win small cash or book prizes by submitting correct solutions to the department. The response was quite positive, with several hundred solutions submitted over the course of the year.

- Two department members developed a "Math Daze" program, where they visited secondary schools and gave talks and demonstrations, ranging from topology tricks to Fibonacci sequences and the golden ratio to applications of graph theory.

- Two department members gave talks at secondary school teachers ProD day on October 20.

- Two department members gave talks at the BCAMT Interior Math Conference held in Kelowna February 16, while a third faculty member organized a round table session for that conference.

SELKIRK – Bevan Ferreira/ Ross Bates

Prerequisite changes: Prerequisites for some of our courses will be changing as of September 2008. Our elementary Statistics course for nonmajors, STAT 105 will have a change from Principles MATH 12 with a C or equivalent to MATH 11 (either Principles or Applications) with a grade of C+ or equivalent. Our Introductory Calculus course MATH 100 will have its prerequisite increased to Applications MATH 12 with a grade of C+ or better, from its current Applications of MATH 12 with a C or better.

In addition, MATH 215, Ordinary Differential Equations will have MATH 221 (Linear Algebra) as a corequisite, while MATH 200 will become a prerequisite. Currently those prerequisites are in the opposite order. This was done to enable more effective scheduling of this course into the Fall semester.

Delivery: Beginning in Fall 2007, STAT 105 will also be available online, on Moodle, Open Source. After having very low enrolment in Fall 2007, STAT 206 will be offered once again in the Winter semester. The 'R' Statistical software package will be used for STAT 206 beginning in Winter 2008, time permitting.

Enrolment: This continues to be a problem for all our second year Mathematics and Statistics courses. Enrolment in our first year courses remains steady however. It is anticipated that enrolment in STAT 105 will increase in Fall 2008, due to the Business Administration diploma program soon to be requiring an Introductory Statistics course in the first year.

We continue to search for ways to deliver a full second year in Mathematics and Statistics at the College in a cost-effective manner.

SFU – Malgorzata Dubiel

SFU (Statistics) – Larry Weldon

1**. New Course – STAT 300W – Statistics Communication**
The course objective is to improve the verbal communication skills of students. We use combination of class discussion, student presentations in class, and written draft reports that are critiqued and re-submitted for final grading. The course is taken by majors/honors in statistics. A paper was written about the content and assessment and is available from KLW (weldon@sfu.ca).

2. **STAT 100 –** This is not a new course but its role is unusual. It is intended for all students including potential stat majors. It is a case study course that covers a much broader list of topics than a typical service course (e.g. examples of survival analysis, spatial distributions, diversification of investments, etc.). It does not drill students in inference techniques.

3. **Admission to major**. Students are now able to declare a major in statistics at any time, including during the process of admission to SFU. The former practice was to require students to have B- average in STAT 270 and STAT 285. Now the same criteria that were used for admission and being applied for continuation in the major – once a student has a mark for STAT 285, if they do not have a B- major in STAT 270-285, they are removed from the major. There are variations of this explained on our website (www.stat.sfu.ca) for transfer students. A completely different system is used for admission to the actuarial science major – entrance is very competitive.

4. **Prerequisites for STAT 402 (Generalized Linear models)** The old prerequisites were STAT 350 or STAT 302. Now it is STAT 350 only. STAT 302 is a service course following STAT 101 and is not an adequate preparation for STAT 350.

5**. Management and Systems Science Program** This undergraduate degree program, is a combination of Math, Bus, Comp Sci, Stats, and Econ courses. It will be managed from the Surrey campus and eventually will be absorbed by the Industrial Math program.

6. **Online Stat 101 –** This course has been running for many years. Those generating online stats courses may wish to consider the FirstClass platform, which has worked well for us at SFU. (www.centrinity.com)

7. **BCcupms Contact for SFU**: Robin Insley (insley@sfu.ca)

THOMPSON RIVERS – Robb Fry

- Jim Totten is retiring
- Jack Bradshaw is retiring
- Don Debrisay is retiring
- The maths and stats department did not receive funding approval for any new tenure track positions
- The maths and stats deptartment is officially starting an honours programme in mathematics this fall, which will include a thesis requirement for graduation
- The maths and stats department is proposing a joint degree in maths and economics
- The maths and stats department is proposing a BBa with a minor in maths
- The chair, Shane Rollans, has expressed concern about the difficulty level of the preliminary round questions for the secondary high school maths contest. He notes that very few students can achieve even a 50% grade
- Jim Totten is searching for a new editor for the CRUX journal to replace him upon retirement

TRINITY WESTERN – Richard Atkins

No report.

UBC (Okanagan) – No representative sent.

UBC (Statistics) – Bruce Dunham

Following on from the recent arrival of UBC President Prof Stephen Toope, the Science Faculty appointed a new dean, Prof Simon Peacock. Another notable appointment is that of Prof Carl Wieman, a Nobel prize-winning physicist, who will spearhead the Carl Wieman Science Education Initiative (CWSEI), a faculty-wide project to improve undergraduate science education at UBC.

The Statistics department has enjoyed a good year, with numbers on UG STAT courses seeming to increase somewhat despite a small drop in the number of Statistics specialists graduating compared to 2005/06. Two new faculty members have been appointed: Prof Jihua Chen, as a full professor and Canada research chair, and Ms Eugenia Yu, a lecturer. This takes faculty numbers up to fifteen. Applicants for a one-year lecturing position were being considered at the time of writing.

Two other recent developments are worthy of note. A new first-year course, STAT 100, has been approved to commence in the Winter term of 2007/08. The course is entitled "Statistical Thinking" and will be modular in nature, with each module focusing on a particular aspect or application of the discipline. The department was also successful in securing funding from the CWSEI, the initial project involving a a "transformation" of our STAT 200 course. The transformation will incorporate identification of learning goals, development of alternative teaching methods and assessments of students perceptions of Statistics and how they learn within the discipline. The academic community within BC will be kept abreast of developments on this, and consulted when appropriate.

UBC (Vancouver) – Wayne Nagata

1. UBC has introduced a new course MATH 190, a 4-credit calculus survey, only for credit in the Faculty of Forestry.

2. Transfer credit and articulation from UBC-Okanagan is still treated as if UBC-Okanagan is an independent university. Course numbers, content, etc. vary between courses at the two versions of UBC.

3. All courses that transferred to the precalculus-plus-Calc1 course UBC MATH 111 were requested (around June 2005) to be rearticulated. The UBC Admissions office is currently determining a specific effective date for all these rearticulation agreements.

4. UBC will continue to require B.C. provincial exam results for admission. However, the UBC administration is currently reviewing this policy.

5. Recent final exams for most UBC math courses are available at http://www.math.ubc.ca/Ugrad/pastExams/

6. Since September 2001, UBC has offered precalulus courses. These courses are not for credit at UBC, and are offered through the Continuing Studies unit, not the Department of Mathematics. Enrollment has been around 100 students per year for the last six years. In comparison, total enrollment in the various versions of Calc1courses at UBC is around 2500.

7. In September 1999, the business-Calc1 course UBC MATH 140 was replaced by MATH 104. There may still be a few business calculus courses offered in B.C. whose course outlines are more similar to the old MATH 140 than to the new(er) MATH 104.

UNBC – No representative sent.

UVIC – Jill Simmons

This year, Mak Trifkovic (Number Theory) and Junling Ma (Mathematical Modelling) joined the department. In addition, Ryan Budney (Topology and Geometry) will join us July 1. We are in the process of hiring our fourth Senior Instructor. We expect to be hiring in Financial Mathematics, and in Applied Mathematics, and possibly another Senior Instructor, next year.

Enrollment is steady: weak in service to Computer Science and Engineering, but strong in service to Business. In fact, Math 151 (Finite Mathematics) is currently our largest enrolment course. The demand for pre-calculus is fairly stable. It increased a bit when we introduced our placement test several years ago. This year we have offered six sections (capacity 60). Next year the number of sections is expected to be between five and seven.

Math 140 (Math for Economics and Econometrics) was introduced to replace Math 103. This new course covers more linear algebra and less linear programming than did the previous one. Math 122 (Logic and Foundations) became a required course for all Mathematics degrees, most combined Math degrees, and an honours Statistics degree. The prerequisite for Math 362 (Number theory) is now Math 122 or Math 233C (Introduction to Algebra).

This past year we had many third and forth year statistics courses added to the calendar: Stat 355, 357, 359, 455, 456, 457, 458, and 459. The fourth year courses are the result of assigning a number to courses previously offered as topics courses under the number Stat 454, while the third year courses are new. The listed courses also appear in the new 2007/2008 calendar. While some of them were offered this past year, others will be offered for the first time in the coming year. With regards to the third year courses, we offered our new course in Data Analysis (Stat 359) for the first time this year, and it was successful and popular. We will be offering the other two new third year statistics courses for the first time next year: Statistical Methods in Biology and Medicine (Stat 355) and Statistical Methods in Quality Assurance (Stat 357).

New for 07/08, we are offering a Combined Major in Mathematics and Economics program. With this new program also comes the addition of a couple of courses: Math 348 (Numerical Methods with Applications in Finance) and Math 477 (Stochastic Financial Modelling).

Our Calculus I course (Math 100) will officially be delivered in 3 lecture-hours per week with a one-hour tutorial. We anticipate the addition of tutorials to other lower-level math and statistics classes in the future. Our first-year Math for the Elementary Teacher courses (Math 160A and 160B) have been restructured, with topics changed and redistributed between the courses. Previously, Math 160A and 160B could be taken in either order, and both had a prerequisite of Math 11. With the changes to the courses for 07/08, Math 160B will have Math 160A as a prerequisite. Courses currently transferable to Math 160A or 160B will need to be re-articulated for possible transfer. Education also requested the addition of a new course for second year Elementary Education students. Math 360 (Math for Education and Liberal Arts) has been added for this purpose, and is open to students outside of the Faculty of Science and the Faculty of Engineering who have taken at least two but no more than three single semester math courses.

We are also working on a new program in Mathematics Education (which would lead to a B.Sc. in Math and a teaching certificate) and a new program in Computational Mathematics. We expect to introduce these programs over the next year or so. Another curriculum proposal coming forward is for a third-year course on the Philosophy of Mathematics. It will be cross-listed as a Philosophy course.

Finally, this opportunity cannot be missed to mention that we are excitedly anticipating the completion of the new Social Sciences and Mathematics building that we are scheduled to move into in February 2008.

VCC – Costa Karavas
- *Precalculus, Calculus I, Calculus II* and *Introduction to Statistics* are offered every semester by the Mathematics Department. The number of sections offered has increased since last year.

- *Calculus I* is strong in the fall semester, but *Calculus II* is weak during the summer.

- *Introduction to Statistics* is popular as it serves as a prerequisite course for the Dental Hygiene program.

- Building expansion at the Broadway campus is well underway. The new building will host Health Science programs currently running at the Downtown campus.

7. COMMITTEE BUSINESS

7.1 Theme for our 86th Meeting
Suggested topics for the 86th meeting included: assessment, on-line courses, intro stats and mathematics for elementary teachers.

7.2 Date and Location of the 86th Meeting
Langara has offered to host the 86th meeting. Both TRU and Okanagan College offered to host the 87th meeting in 2009, and SFU offered to host the 88th in 2010.

The date for the 2008 meeting was tentatively set for May 13 – 15.

7.3 List Updates: E-mail.
Members were asked to ensure that addresses on the email list are correct. Telephone and fax number lists will no longer be maintained.

Leo offered to create a pdf file of the email list which could be sent to everyone on list. However concerns about this were raised and in the end it was decided that only the Chair, Vice-Chair, Secretary and Chair of the Stats Subcommittee will be provided with the master list. Contact information for institutional representatives is still available on the BCcupms website.

To send a message to the listserve, send the email to : bccupm@lists.bccampus.ca

7.4 BCcupms Web Site – Leo Neufeld
Allan Cooper had the foresight to reserve the url www.bccupms.ca, which is now active, and will be permanent. This website is now being hosted by UCFV. An annual fee of $35 is required in order to keep the url. There was some discussion about how this annual fee will be covered. Susan Milner will discuss funding with her department. The group expressed its appreciation to Allan (in absentia) for taking the initiative on this.

[Addendum: UCFV is willing to pay this year's cost but is not prepared to do so in perpetuity. One suggestion is that the institution that is hosting the articulation meeting pay the fee for that year.]

Ian Affleck is the official webmaster for the site. He can be contacted at ian.affleck@ucfv.ca. It was agreed that the webmaster should be encouraged to attend the articulation meetings in order to stay up to date on developments. Ian was unable to attend this year.

8. Adjournment of the Wednesday session

The Wednesday Session of the 85th meeting of the BCcupms adjourned at 4 :15 p.m.

Many, many thanks to Tim Topper and Yukon College for all their work in hosting us for this meeting. The catering and the transportation arrangements were outstanding.

List of Committee Members Present   Plenary Session – Tuesday, May 15, 2007 (a.m./p.m.); Secondary Teachers Session – Tuesday, May 15, 2007; Concurrent Math/Stats – Wednesday, May 16, 2007; Plenary Session – Wednesday, May 16, 2007(a.m./p.m.)

Name	Institution	TUES	TEACHER	MATH	STATS	WED
Richard Atkins	Trinity Western University	X	X	X		X
Jim Bailey	College of the Rockies (Vice Chair)	X	X	X		X
Ross Bates	Selkirk College	X	X	X		X
Deanna Baxter	Capilano College	X	X		X	X
Eugene Belchev	Langara College	X	X	X		X
Gera Belchev	Coquitlam College	X	X	X		X
Nicholas Buck	College of New Caledonia	X	X	X		X
Hongbin Cui	Northern Lights College	X	X	X		X
Marie Daniels	F.H. Collins High School		X			
Jason Diemer	North Island College	X	X	X		X
Malgorzata Dubiel	Simon Fraser University	X	X	X		X
Bruce Dunham	University of British Columbia—Statistics (Chair of Statistics Subcommittee)	X	X		X	X
Bevan Ferreira	Selkirk College	X			X	X
Robert Ferro	Yukon College	a.m.	X	X		X
Nora Franzova	Langara College	X	X	X		X
Robb Fry	Thompson Rivers University	X	X	X		X
Al Fukushima	Nicola Valley Institute of Technology	X	X		X	X
Gerald Haase	Yukon College					p.m.
Peter Hurthig	Columbia College	X	X	X		X
Mona Izumi	Northwest Community College	X	X	X		X
Costa Karavas	Vancouver Community College	X	X	X		X
Colin Lawrence	BC Institute of Technology	X	X		X	X
Clint Lee	Okanagan College	X	X	X		X
David Leeming	University of Victoria (Emeritus)	X	X	X		X
Wendy Lynn	Capilano College	X	X	X		X
Wayne Matthews	Camosun College	X	X	X		X
Tom McBee	Yukon College	X	X			X
Susan Milner	University College of the Fraser Valley (Chair)	X	X	X		X
Wayne Nagata	University of British Columbia (Vancouver)	X	X	X		X
Leo Neufeld	Camosun College (Retired)	X	X	X		X
Michael Nyenhuis	Kwantlen University-College	X	X	X		X
Susan Oesterle	Douglas College (Secretary)	X	X	X		X
Geoffrey Salloum	Camosun College	X	X		X	X
Robert Sidley	BC Association of Mathematics Teachers	X	X			
Jill Simmons	University of Victoria	X	X		X	X
Dean Slonowsky	Malaspina University College	X	X		X	X
Wesley Snider	Douglas College	X	X	X		X
Paula Thompson	Yukon Ministry of Education	X				
Tim Topper	Yukon College	X	X	X		X
Larry Weldon	Simon Fraser University—Statistics	X	X		X	X
Mike Winsemann	BC Council on Admissions and Transfer	X	X			

*UNBC and UBC(Okanagan) did not send representatives to this meeting.

List of Participants (Professional Development Sessions (Statistics)) – Thursday, May 17, 2007

Name	Institution
Ross Bates	Selkirk College
Jim Bailey	College of the Rockies
Deanna Baxter	Capilano College
Hongbin Cui	Northern Lights College
Bruce Dunham	University of British Columbia—Statistics
Bevan Ferreira	Selkirk College
Al Fukushima	Nicola Valley Institute of Technology
Geoffrey Salloum	Camosun College
Dean Slonowsky	Malaspina University College
Larry Weldon	Simon Fraser University—Statistics

List of Participants (Professional Development Sessions (Mathematics)) – Thursday, May 17, 2007

Name	Institution	Math for Elementary Ed (9 – 10:50)	Maple TA for Assessment (11 – 11:50)
Jim Bailey	College of the Rockies		X
Eugene Belchev	Langara College	X	
Gera Belchev	Coquitlam College	X	
Nicholas Buck	College of New Caledonia	X	X
Hongbin Cui	Northern Lights College		X
Jason Diemer	North Island College	X	X
Malgorzata Dubiel	Simon Fraser University	X	X
Robert Ferro	Yukon College	X	
Nora Franzova	Langara College	X	X
Gerald Haase	Yukon College	X	
Mona Izumi	Northwest Community College	X	X
Clint Lee	Okanagan College	X	X
David Leeming	University of Victoria (Emeritus)	X	
Wendy Lynn	Capilano College	X	X
Wayne Matthews	Camosun College	X	X
Tom McBee	Yukon College	X	
Susan Milner	University College of the Fraser Valley	X	X
Leo Neufeld	Camosun College (Retired)	X	
Susan Oesterle	Douglas College	X	X
Wesley Snider	Douglas College	X	X
Tim Topper	Yukon College		X

BC Secondary School Mathematics Contest 2007
Report to the BCCUPMS

On May 3, 2007 the Final Round of the BC Secondary School Mathematics Contest was written at 11 provincial colleges, university colleges, and universities. Students who had performed well on an earlier preliminary round held within their own high schools were invited (together with a teacher sponsor) to attend the final round and spend a day at the local post-secondary institution with several activities involved.

This year the participating institutions were:

    Camosun College   (Cam)
    Capilano College   (Cap)
    College of New Caledonia   (CNC)
    Douglas College   (Doug)
    Langara College   (Lang)
    Malaspina University College   (MUC)
    North Island College   (NIC)
    Northwest Community College   (NWCC)
    Okanagan College/UBC Okanagan   (OC/UBCO)
    Thompson Rivers University   (TRU)
    University College of the Fraser Valley   (UCFV)

The table below gives a summary of the number of students and the top scores (out of a possible 100) in the Final Round at each institution.

Institution	Final Round		Top Three Scores		Averages	
	Juniors	Seniors	Junior	Senior	Junior	Senior
Cam	23	13	83, 68, 65	61, 58, 44	44	40
Cap	30	29	92, 91, 87	94, 88, 88	52.5	58.4
CNC	16	18	59, 54, 51	60, 56, 52	28	30
Doug	18	20	79, 65, 62	89, 75, 72	43	54
Lang	9	27	83, 67, 64	77, 64, 62	52.1	40
MUC	30	32	67, 60, 58	100, 100, 56	31.75	38.16
NIC	15	7	48, 46, 45	37, 35, 35	28.7	30.6
NWCC	17	10	41, 39.5, 35	47, 46, 43	22.3	35.9
OC/UBCO	37	25	59, 56, 55	67, 59, 48, 46	31.9	34.4
TRU	30	32	66, 63, 55	65, 63, 53	61.3	60.3
UCFV	38	26	73, 64, 60	84, 65, 64	37.1	39.8
TOTAL	263	239				

Approximately 1275 Juniors and 860 Seniors wrote the Preliminary Round this year. The top reported Junior and Senior Preliminary scores were both 60 out of 60. Note that not all schools report Preliminary Round scores or participation numbers, so these are not a completely accurate reflection of the level of participation in the Preliminary Round. A total of 502 students participated in the Final Round this year, up 10 from last year in spite there being one less institution participating this year.

The Preliminary Round is handled in essentially the same way at all institutions. The preliminary test papers are mailed to participating schools. The tests are administered and marked at the schools and the results, including the names of the Final Round participants, are transmitted to the hosting institution. The Final Round does have variations. At all institutions the Final Round contest was administered on the morning of May 3, with some type of activity provided for the sponsoring teachers, and, after the contest was completed, lunch was provided for all participants. After lunch the activities varied. Some institutions had talks for the participating students and teachers, others combined talks with other activities, such as a math relay or scavenger hunts. During the time that the afternoon activities were taking place, the tests were marked, and later in the afternoon prizes were awarded. The prizes varied among institutions. Some institutions gave book prizes to all or selected participants; some institutions gave cash prizes and/or scholarships to winners; many gave T-shirts to all participants.

Thanks should go to those who have been involved in organizing their own college faculty to get on board, and have also been actively enlisting the local teachers to encourage involvement of their high schools.   First there are the primary contacts at each of

the Colleges: Wayne Matthews at Camosun College; Marsha Anderson at Capilano College; Nicholas Buck at College of New Caledonia; Ken Collins and Nora Franzova at Langara College; Patrick Ng at Malaspina University College; Slava Simice at North Island Community College; Mona Izumi at Northwest Community College; Clint Lee and Leslie Corbett at Okanagan University College and Wayne Broughton at UBC Okanagan; Susan Milner at University College of the Fraser Valley; and Fae Debeck at The University College of the Cariboo. Although these are the primary contacts at each institution, it goes without saying that they did NOT do all the work required to make this contest a success. Indeed, they have indicated that their entire departments were involved with hosting the contest. Special thanks should go to John Grant-McLoughlin of University of New Brunswick, who, as a professor in Mathematics Education, continues his involvement with our contest even though he is on the other side of the country and brings the rest of us back to reality regarding what we can reasonably expect high school students to be able to handle.

Furthermore, the problem posers who either submitted problems or came together at the Northwest Community College last May in Victoria to put together the initial drafts of the contest papers are: Wayne Matthews (Cam), Jim Bailey (COTR), Nicholas Buck and Edward Dobrowolski (CNC), Clint Lee and David Murray (OC), Susan Milner (UCFV), Nora Franzova (Lang), Mona Izumi (NWCC), Slava Simice (NIC), and Fae DeBeck (TRU).

In addition, those who proof-read the contest are: Clint Lee (OC), John Grant McLoughlin (UNB), Dave Murray (OC), Susan Milner (UCFV), Nora Franzova (Lang), Susan Milner and crew of many others (UCFV), and Nicholas Buck (CNC).   The solutions were prepared and typeset by Jim Bailey (COTR), Norm and Leslie Corbett (OC), Nicholas Buck (CNC), and Clint Lee (OC). The final compilation and typesetting of the contest papers and solutions was done by Clint Lee, who also is responsible for distributing the contest materials to all of the participating post-secondary institutions.

My apologies to anyone whose name may have been inadvertently left out.

One further point should be made, which has been overlooked in previous reports. While most of the BCSSMC activities are funded by local institutions, the province wide nature of the Contest has meant that some external funding, specifically for travel, was required. This funding has been generously provided by the Pacific Institute for the Mathematical Sciences, PIMS. This funding has mainly been used to pay for travel of speakers from one institution to the other for the Final Round activities. This year PIMS has further agreed to help pay for the travel by the BCSSMC Provincial Coordinator, currently Clint Lee, to the BCCUPMS meeting for the purpose of participating in the problem preparation session held in conjunction with that meeting.

For those planning for next year, the dates I am suggesting for the 2008 contest are:

      Preliminary Round: Wednesday March 5, 2008

      Final Round: Thursday May 8, 2008

Respectfully submitted to the BCCUPMS on May 15, 2007 by

Clint Lee