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

MINUTES OF THE 86th MEETING, MAY 13 – 15th, 2008

TUESDAY, MAY 13, 2008

1. WELCOME

Martin Gerson, Dean of Instruction at Langara College, welcomed the BCcupms to its 86th meeting.

2. ADOPTION OF THE AGENDA FOR THE 86TH MEETING OF THE BCcupms

The Agenda for the 86th Meeting was approved by consensus.

3. ADOPTION OF THE MINUTES OF THE 85TH MEETING, HELD AT YUKON COLLEGE

The Minutes of the 85th Meeting were approved by consensus as posted on the BCcupms Website.

4. ANNOUNCEMENTS

4.1 Notice of Elections: At this meeting elections for Chair of the BCcupms and for Chair of the Statistics Subcommittee of the BCcupms will be held. These positions have two-year terms. Leo Neufeld, Malgorzata Dubiel and Nora Franzova volunteered to coordinate nominations for Chair of the BCcupms. The search for Chair of the Statistics Subcommittee was deferred to the Statistics Parallel session.

4.2 Conferences: Malgorzata Dubiel reminded the committee of the upcoming CMS Mathematics Education Forum which will be held in Vancouver, April 30 – May 3, 2009. George Bluman announced a talk by Richard Askey on Geometry at UBC, May 15, 2008. Justin Gray encouraged committee members to attend the LON-CAPA Conference which is being hosted by SFU, May 22 – 24, 2008. Michele Roblin announced that the BCAMT Fall Conference will be held at Windermere Secondary in Vancouver on October 24 and that the 2009 Pacific Northwest Conference will be held in Whistler.

4.3 Attendance Lists: Jim Bailey circulated the attendance lists.

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

5. A Viable Option for Online Diagnostic and Placement Testing—Justin Gray

Justin demonstrated the LON-CAPA system which has been used by the Mathematics Department at Simon Fraser University for the last two years for diagnostic and placement testing, as well as for on-line homework. They have also recently started using it for the on-line Math for Teachers course.

The LON-CAPA acronym stands for Learning On-line Network with a Computer Assisted Personalized Approach. It is open-source software developed by the University of Michigan in 1992. It allows for a wide variety of question types including multiple choice, numerical and algebraic answers. A Computer Algebra System (MAXIMA) is built in, and the system is capable of recognising equivalent units and expressions, including trigonometric identities. Images can be uploaded, but plots can be generated right in the system. Authoring is facilitated by template problems that can be edited and a drop-down formula editor that can help with syntax errors. There is also a list-serve with experienced users who are able to provide assistance. SFU runs and maintains their own server, but posting is available through LON-CAPA, whose servers are located in Michigan. Information on hosting and rates can be found at www.lon-capa.org .

Justin noted that advantages of this system include its independence from any text or publishing company and the openness of the developers to recommendations for improvements to the system. It has also been around longer than any current commercial system.

The Mathematics Department at SFU has a 30 question, 90-minute, timed test for students who lack the formal prerequisites but would like permission to register in Calculus. The test is written on-line in a supervised setting. Access to the test is restricted to an IP address. Test questions are selected randomly from a pool of questions and within questions some parameters are algorithmically generated. Students have access to a 4-function calculator on the desktop. A practice version is available on-line, which helps students self-assess whether it is worthwhile to attempt the real test. The programme allows students to work on questions in any order, and tells them how much time is left. Results are immediate. Students need 20/30 to go on to Calculus, and retakes are not allowed. See www.math.sfu.ca for a link to the information for students about this test and access to the practice test.

This same test is also used for large scale diagnostic testing in Simon Fraser's first-year calculus courses. A portion of the student's grade is based on the results of this test and on the remedial follow-up work that they do based on their results.

Justin commented that most institutions offer assessment testing, and that the level of difficulty (and efficacy) of the tests varies widely between institutions. The LON-CAPA network provides a learning repository, allowing for system-wide publishing of problems and resources. This makes it easy to collaborate or pool efforts. SFU has run their test on 3000 students and their results to date indicate that students who do well on the test do well in Calculus. Poor scores have been less reliable as predictors. He invited members of the committee to contact him if they would be interested in collaborating on assessment testing.

6. BCcupms Website—Ian Affleck

Ian described the features and organisation of the BCcupms website. Members were encouraged to send pictures to Ian so that he can include them with the "Members" information. Representatives were reminded to check to ensure that their contact information is up to date. Ian also invited members to send him any ideas for additions or improvements to the site. In particular he would like to add links to good Canadian course resources. Ian can be reached via the Webmaster Link on the site.

Thanks were extended to Alan Cooper for registering the domain name for the site. The cost to maintain the name is $35 per year, and to date this has been paid for by UFV (formerly UCFV). Discussion of how this should be funded in the future was added to the Agenda under item 7.3 for the Wednesday Plenary Session.

Mathematics and Statistics Subcommittee Sessions (held concurrently)

MATHEMATICS SESSION

Math1. Principles of Math 12 Provincial Exam—Effects of its Optional Status

Susan Milner opened discussion on the effects of the new optional status of the Principles of Math 12 Provincial Final Exam. Four or five representatives indicated by show of hands that their institutions were planning changes in response.

As a member of the UBC Senate and a public representative on the Provincial Board of Examiners, George Bluman reported that there is great concern about the optional exams and their impact on schools, and also on the now mandatory Grade 10 exams. The number of students writing the optional grade 12 exam decreased from 89% in January 2007 to 79% in January 2008. He anticipated a full discussion at the next Board meeting, but noted that any changes would take 2 – 3 years to implement. At the UBC Senate meeting the vote on whether or not to continue to require the Grade 12 provincial exam for admission to the university was tied. As a result there was no change; however the issue will be coming up again at Senate. George predicted that UBC will make the exams optional starting in September 2009.

Subject to Senate approval, UBC will offer a 6-credit course combining pre-calculus and first-semester calculus this Fall, to accommodate underprepared students. This course will begin in October, so that students who started in Calculus in September and are not succeeding will be able to access it. It will run until the end of April, and will provide more hours per week, including tutorial sessions. This new course, called Math 110, will be similar to the previous Math 111.

UVic does not require the provincial exam.

Malgorzata Dubiel reported that at Simon Fraser University the provincial exam is currently still required, but indicated that SFU would change their policy if it was changed at UBC. Attracting students is a concern. Since Simon Fraser began

admitting students with lower grades there has been increased concern about retention. Resources have been provided by the Dean to make the Calculus Readiness Test compulsory for Calculus I students and to offer increased tutorial support for students at risk. This mechanism would also allow them to deal with weaker students who may find their way into the course now that the provincial final is optional. (Susan Milner commented that they are working on implementing something very similar to this at UFV). An A in Principles of Math 12 is the current prerequisite for Math 151, while a B is required for other varieties of Calculus I. If necessary, SFU will consider raising the prerequisites.

At Langara College the Mathematics Department expected to require the exam as a prerequisite for their courses, but they were over-ridden by their Education Council. The main motivation seems to be to prevent losing students to other institutions who no longer require the exam.

Mike Nyenhuis indicated that Kwantlen has not changed its current policy of requiring the exam, but will be watching to see what happens at other institutions.

Capilano also still requires it. Deanna Baxter explained that since the exams are late, admission is based on school grades alone, but it is still used for course prerequisites. Capilano currently has a pre-requisite of A for entry into Calculus I, and has a diagnostic test that they use to assess student readiness for students with lower grades who wish to take Calculus. If it seems necessary, more students could be asked to take this test.

At UNBC there is no reference to provincial exams in the calendar: students are admitted based on whatever information the university receives from the high school. Jennifer Hyndman commented that many students in their area do not have access to PM12 in their schools, and come from a wide variety of backgrounds. Raising prerequisites would have a negative impact on enrolment. The prerequisite for Calculus is a C in PM12. Given funding and staffing levels it is extremely difficult to offer the necessary support for underprepared students. They do encourage their students to take upgrading courses from the local school district or at CNC.

At Douglas College the better of the student's final school grade in PM12, or their blended grade, including the provincial final, are recorded to use for prerequisite checking.

Michele Roblin commented on the issue from the perspective of high school teachers. She observed that the optional nature of the exam has been problematic. An unusual classroom dynamic arises when some students in the class are writing final exams, while others are not. Her school has decided to impose a "school final" in order to keep students focussed in May and June. It was observed that students could avoid writing both exams by saying that they will write the provincial exam, but then not actually following through with it. Michele also indicated that teachers would likely support having a mandatory exam for Math 11, as opposed to Math 10 or Math 12.

Richard DeMerchant warned that changes in final exam policy were unlikely since they form part of the Graduation Programme which is very difficult to change and is usually only revisited every 10 years or more.

Susan Milner reported that the UFV Board decided to drop the requirement for the final exam. However the department has been directed not to raise pre-requisites and not to lower standards. Money has been allocated to provide students who do poorly on diagnostic tests with special remedial sessions that will count for 10% of their grade. There will also be extra support for the on-line homework system to be used by all calculus sections. If these measures are unsuccessful, the department will likely push for placement testing. By show of hands, two or three other institutions indicated that they would consider implementing a placement test if student performance declines as a result of this change in final exam policy.

ACTION: Members of the BCcupms will send email to George Bluman (bluman@math.ubc.ca) describing the effect the optional status of the PM12 Provincial Final Exam is having on their institutions before the beginning of September. George will take this information forward to the meeting of the Provincial Board of Examiners.

Math2. B.C. College of Teachers Changes in Teacher Certification Requirements

In the spirit of the BC-Alberta Trade, Investment, and Labour Mobility Agreement (TILMA), the BC College of Teachers recently changed the requirements for certification of teachers in BC, in order to make it easier for teachers to move between provinces. The changes include a decrease in the number of credits of academic course work taken in faculties outside of education from 60 to 30, removal of the requirement for secondary teachers to have a second teaching area, and redefinition of

a teaching area to be 24 credits in that area with no requirements for senior or upper-level course work. Details of the changes are available on the BC College of Teachers website, www.bcct.ca . These changes could mean that enrolment in upper level courses will drop and that there may be more mathematics teachers in secondary schools with weaker math backgrounds.

It was noted that the effects of the changes would be mediated by what schools require for teachers to teach a subject, what requirements for graduation the universities have in place, and what Mathematics Education faculties do. UVic has been increasing the number of Mathematics courses that students need to take. UBC offers dual degrees in Mathematics and Education, and Physics and Education. At UNBC a number of their mathematics majors are choosing to go into Education.

The BCAMT has not yet discussed this at an executive level.

Math3. Math for Elementary Education—Malgorzata Dubiel and Susan Oesterle

Malgorzata reported on the work of the Math for Elementary Education Curriculum Subcommittee which was struck at last year's articulation meeting. The committee met 8 times through the year. The meetings were attended by core committee members (Malgorzata Dubiel (SFU), Susan Milner (UCFV), Susan Oesterle (Douglas), Wayne Matthews (Camosun), and Wendy Lynn (Capilano)) along with frequent attendance by representatives from UVic (Margaret Wyeth), PIMS (Melania Alvarez Adem), SFU Education (Bernice Kastner) and UBC Education (Brent Davis). During these meetings the committee formulated drafts of a list of core topics and a preamble outlining guiding principles. The committee also produced and administered a survey (see below). Malgorzata reviewed the "Guiding Principles" Draft which highlights important considerations for those planning to teach a MFEE course, including features that make this course unique, and a description of the broader goals that this course should aspire to. Copies of this document and the draft of core topics are available on the BCcupms web-site, along with minutes of the meetings.

Malgorzata acknowledged the financial support provided by the Mathematics Department at SFU (and PIMS) for the meetings.

Susan Oesterle summarised the results of the survey which was designed to gather information from current elementary school teachers about their experiences with their own MFEE course(s). Despite making the survey available on the web (thanks to Justin Gray), and including the survey in the packages of teachers attending the Fall 2007 BCAMT meeting, the response rate was low, with only 14 teachers responding. Nonetheless the respondents represented a broad cross-section of experience. Many of the themes that arose during the meeting of the committee were reflected in the teachers' comments. These included the importance of the instructor in making the course relevant and inspiring, the impact of the course on attitudes, and the insufficiency of a single course to prepare future teachers. The full Survey Summary will also be available on the BCcupms web-site.

Malgorzata indicated that the work of the committee was not yet complete. Feedback needs to be solicited from a broader audience on the drafts of the topic list and the guiding principles before they are finalised. Also the committee has not yet produced any recommendations on textbooks.

Motion: (moved by Justin Gray and seconded by Wesley Snider)

That the Math for Elementary Education Curriculum Subcommittee carries on its work for another year, and reports again at the 2009 BCcupms meeting.

Carried unanimously.

Math4. Math Fairs—David Lidstone

David gave a short presentation on the nature and benefits of Math Fairs. He described them as being similar to Science Fairs, except that their focus is on problem-solving and they are non-competitive. He attributed the origin of these events to Ted Lewis and Andy Liu (University of Alberta), who presented the topic at the 2001 CMESG meeting. A Math Fair Booklet is available through PIMS.

At Langara, participation in a Math Fair is required for students taking the Math for Elementary Teachers course. It comprises half of their term project mark (20% in total). The other half consists of a paper which delves more deeply into the problem they present at the Fair. Students work in teams of three to create a display, which is graded, as is their interaction with guests. Friends, faculty and families are invited to the Fair which is held in an open public place during a two-hour class time block.

Dealing with group dynamics and evaluation of the projects and papers present the greatest challenge to incorporating the Math Fair into the course. However there are great benefits to be gained. Participation in the Fair encourages students to think and act as teachers, and sharing the event with the public makes them think about making math accessible. It also helps improve the attitudes of MFEE students as they get involved with problems that are more than just text exercises, and have fun sharing the mathematics with others.

STATISTICS SESSION (please see the complete Minutes of the Statistics Session on page 25)

Stats1. Approval of Agenda

Stats2. Approval of Minutes from Statistics Subcommittee Meeting at 85th Meeting

Stats3. Matters Arising from the Minutes

Stats4. Institutional Reports

Stats5. Issues regarding articulation and transfer for Statistics courses, including any future changes to existing articulation agreements.

Stats6. Discussion of the distinguishing features of various types of "service" courses in introductory Statistics.

Stats7. The transformation of UBC's STAT 200 course.

Stats8. Election of Statistics Chair for 87th meeting.

Stats9. Other Business

Stats10. Motion to Adjourn

Plenary Session

7. 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.

8. Report from the Ministry of Education—Richard DeMerchant

Richard announced that the WNCP Grade 10 – 12 curriculum is now complete and implementation will begin in September 2010 (grade 10), September 2011 (grade 11) and September 2012 (grade 12). This new curriculum was developed in order to incorporate new research in teaching and learning and to address concerns about excessive content, transitions between grades, and the lack of acceptance of Applications of Math by post-secondary institutions.

Principles of Math, Applications of Math and Essentials of Math will no longer exist once the new courses are implemented. They have been replaced by very different new pathways: Apprenticeship and Workplace Mathematics, Foundations of Mathematics and Pre-calculus Mathematics. Apprenticeship and Workplace Mathematics is intended for students who require math for the majority of trades and entry into the workforce requiring a Dogwood, and will be available to students starting in Grade 10 and continuing into grades 11 and 12. A second course available in grade 10, Foundations and Pre-calculus Mathematics 10, is designed for students continuing into Foundations of Math 11 (designed for students aiming for post-secondary programmes that do not require Calculus), or Pre-calculus Math 11 (designed for students aiming for post-secondary

programmes that require calculus. All three pathways are also offered at the Grade 12 level. Since there are no pre-requisites in BC, students would be able to go from any of the 11-level courses into any other 11-level course. A Grade 11 or Grade 12 mathematics course will still be required for graduation. Calculus 12 will still be available and there are currently no plans to revise this course.

All three pathways emphasise development of conceptual, in-depth understanding of topics. Communication, connections, mental math and estimation, problem-solving, reasoning, technology and visualisation are integrated throughout. The curriculum documents include achievement indicators that will assist teachers in addressing the breadth and depth of each outcome.

In the research conducted prior to the revision, post-secondary instructors requested 150 outcomes for students entering calculus. This was 50% more than the current 100 outcomes within the Principles of Mathematics courses. The main focus of Pre-calculus is functions and algebra and contains no geometry or statistics beyond the common grade 10. The content in the Foundations of Mathematics pathway and the Pre-calculus pathway are sufficiently different so that interested students could opt to take both. Note that the courses are designed to be taught in 100 hours. In the past many schools were not able to provide 100 hours. In some cases the instructional time was as low as 90 hours.

Optional implementation of K to 7 has started already. Mandatory implementation of the new curriculum in Grades K, 1, 4 and 7 will begin this Fall; Grades 2, 5 and 8 in Fall 2009, followed by Grades 3, 6, 9, and 10 in 2010, Grade 11 in 2011, and Grade 12 in 2012. Details of the curriculum are available on the WNCP website, www.wncp.ca (click on subject areas and then mathematics). Newfoundland, New Brunswick, and Prince Edward Island are also expected to adopt the WNCP curriculum, leaving only Nova Scotia, Ontario and Quebec not using it.

Richard's presentation also included demographics data which showed an on-going decline in the number of K – 12 enrolments, and an increase in the average age of BC's population. By 2012 the province is expected to have more residents over 65 than school-aged. Increasing numbers of retirements will mean a labour shortage. As well, by 2015 44% of jobs will require post-secondary education less than a university degree. These trends indicate that there will be a greater number of entry-level jobs as employers recruit and train young workers on the job. Traditional post-secondary institutions will face an increasingly competitive market.

Richard described some of the difficulties with the former mathematics pathways, including: a disproportionate number of students registered in PM12 given that the course was designed only for students planning to take university calculus, the difficulties some schools experienced offering the full range of courses, and the large number of students (approx. 55%) who drop Math after Grade 11. He felt that many students were turned off math because they were in the wrong pathway, and expressed the hope that these problems would be eased by the new curriculum. Success of the new curriculum hinges on the acceptance of the Foundations of Mathematics and Apprenticeship and Workplace Mathematics pathways by post-secondary institutions, and on ensuring that parents, counsellors, teachers and students are well-informed about the pathways and where they lead. He asked members of the committee to read through the curriculum packages and encourage their institutions to accept Apprenticeship and Workplace Mathematics, Foundations of Mathematics and Pre-Calculus Mathematics where appropriate for admission or as pre-requisites.

Questions and comments can be directed to Richard. He can be reached at the Education Standards Unit, BC Ministry of Ed, phone 250 – 387 – 4784, or via email at richard.demerchant@gov.bc.ca.

The Tuesday Session of the BCcupms adjourned at 3:55 p.m.

BCCUPMS and Secondary School Teachers Session

1. Introductions and Opening Remarks

We welcomed Magnus Birkner and Sara Forsey from Vancouver School Board Continuing Education, Michael Finnigan from Yale Secondary in Abbotsford, and Maggie Przyborowska from Windermere Secondary (and VSB), to our Secondary School Teachers Session.

2. Reports

2.1 BCAMT – Michele Roblin

Michele Roblin reported that the major focus of the BCAMT over the coming year will be the implementation of the new WNCP curriculum. The key role of her group will be in getting information out to all stakeholders via the BCAMT listserve and through professional development activities. She emphasised that the new pathways represent very different courses and urged post-secondary institutions to make decisions quickly on their status. The Mathematics Department at UBC has already made the recommendation that Precalculus 11 or Foundations of Math 12 be used for admissions, and that Foundations of Math 12 be accepted as a prerequisite for the Math for Elementary Teachers course. This has not yet been finalised.

Michele and the other high school teachers present noted that the Applications Math stream was not offered by many schools. Parents wishing to keep doors open for their children at university encouraged them to take Principles Math. Richard DeMerchant observed that with many institutions accepting either PM11 or AM12, students often opted to take the chance on needing to take PM11 twice, rather than take AM11 and then AM12. There was concern that Foundations Math would suffer the same fate. Michael Finnigan commented that Yale Secondary, given its emphasis on academics, had already decided not to offer Foundations.

Malgorzata Dubiel encouraged high schools to include the Foundations courses, given how different they are both from the Precalculus courses and from the former Applications courses. She indicated that it is likely that SFU will accept Foundations of Math 12 for admission. This pathway has great potential due to its emphasis on reasoning; and she suggested that students who finish Foundations of Math 12 may be in a good position to take Precalculus at SFU. Ideally students could take both streams.

Richard DeMerchant related that the Ministry had tried to set up a webpage for prerequisites into universities and programmes; but changes were hard to keep track of. It was agreed that it would be useful to have a place for students to easily find this information. David Leeming agreed to bring this up with Finola Finlay at the Wednesday Plenary Session (see below).

2.2. BC Secondary Schools Mathematics Contest – Clint Lee (see attached report, page 23)

It was agreed to add discussion of a possible change of name for the contest to honour Jim Totten under item 5.3 of Wednesday's agenda.

2.3 BC Universities' Calculus Challenge Exam – Malgorzata Dubiel

Malgorzata announced that SFU will be hosting the challenge exam this year. Information can be found via a link on the Math Department website. UBC hosted it last year but information on numbers of participants was not available.

3. General Discussion

3.1 Provincial Exam Optional for Grade 12

Highlights of the Math1 discussion (see above) were summarised.

3.2 On-line Secondary Mathematics Courses

Michael Finnigan described the on-line Math 12 course that he is involved with. Students who are taking the course on-line can meet with him for face-to-face tutoring sessions for three hours, twice per week in the evenings. Students do not find the video instruction helpful and he finds that he ends up re-teaching the lessons when he meets with them. This programme has not been successful: 58 students started in February, but only 12 remain.

Comments were made about the difficulties in developing effective on-line courses. In most cases the courses are text-based with accompanying videos.

After some discussion it became evident that there were several very different Math 12 courses being offered on-line, with different methods of evaluation and different standards. The number of these courses is increasing as funding formulas have been changed to encourage on-line courses. Since funding per student is the same for on-line students as for those taking courses in person, on-line courses are seen as a source of easy cash for school districts. On-line courses are also attractive to students who believe that they may be able to complete the course more easily and with a higher grade.

There was great concern over the lack of quality control, especially since student transcripts do not indicate that the course was taken on-line and no provincial final is required for Grade 12 Math. Although having an annotation appear on the transcript beside on-line courses would be helpful, it was agreed that this would be unpopular as it would likely discourage students from choosing the on-line option.

Motion: (moved by George Bluman and seconded by Jennifer Hyndman)

That in the interest of increasing confidence in on-line Principles of Math 12 courses, we recommend that the provincial final exam grade be used as the final grade for the on-line Principles of Math 12 course.

[Motion: (moved by Alan Cooper, seconded by Malgorzata Dubiel)

That the question be called.

Carried. (15 for, 13 against, 2 abstentions)]

Carried. (20 for, 2 against, 4 abstentions)

ACTION: George Bluman will carry the motion to the Provincial Examination Board.

3.3 State of science in high school; connections to mathematics

This item was tabled.

5. Adjourn to Reception. The session adjourned at 5:34 p.m.

WEDNESDAY, MAY 14, 2008

Plenary Session

1. OPENING REMARKS

1.1 Introduction of representatives

1.2 Announcements from the host

Nora Franzova made announcements about the Greek Dinner. She also invited participants to take a look at the table exhibiting children's literature related to Math during the coffee breaks.

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.

1.5 Report from the nominating committee

Jim Bailey was nominated and acclaimed as the new Chair of the BCcupms. The nominating committee agreed to continue their search to find a replacement for Jim for his position as Vice Chair for one year.

Many thanks were extended to Susan Milner for her dedication and wise leadership as Chair since 2002.

2. CORRESPONDENCE

Susan Milner reported that she had sent copies of the 2007 motion regarding the Provincial Math 12 exams to the Ministry of Education, institutional Registrars, the BCAMT (Michele Roblin), George Bluman and to the BCCAT Admissions Committee. She received acknowledgement from Michele Roblin and George Bluman.

3. REPORTS

3.1. **BCCAT**—Finola Finlay

In her report on the latest happenings at BCCAT, Finola began by describing current efforts to collect information on students in the system. In particular, students are now assigned a personal education number (PEN) when they start kindergarten which they carry through the public system, allowing for mobility studies. She recommended that those interested google "Student Transitions Project BC" to see information on post-secondary participation rates, which are higher than expected. She noted that there are now fewer students in the system, and that as a result BCCAT will be looking at the needs of returning adult students.

She reported that BCIT, the 3rd largest receiving institution in the province, and also an enormous sender, has not yet published its transfer information, but has an internal project underway to address this. This is a particular challenge because of the uniqueness of a number of its programmes.

She drew the committee's attention to the new policy on designation as a receiving institution and provided a handout with details. As of next year sending institutions that are not yet receivers will be considered. Before being accepted as receivers, institutions are expected to consider carefully whether there is enough volume to make it worthwhile to establish and maintain articulation agreements, whether there is a real need to be considered a receiving institution, and whether there are sufficient resources in place (staffing, training) to support the change in status. A handbook has been written on best practices which will be available in print and on-line shortly. There was general support for this change from members of the committee. It was noted that new articulation agreements need to be considered carefully, as simply reversing current transfer isn't always appropriate. Similarly, assuming that if course A transfers to B, and C transfers to B, then A transfers to C (triangulation) is also not automatic.

Finola described the history of acceptance of private institutions into the BCCAT system. A complete list of such private institutions is listed on the BCCAT website. Currently, any institution with a degree programme that went through DQAB and received ministerial consent is approved to request articulation. Once admitted they are required to send a representative to the articulation committee.

ACTION: Finola will work with Jim Bailey to ensure that representatives from private institutions are contacted and invited.

As part of the TILMA, ACAT and BCCAT have been encouraged to develop agreements regarding acceptance of courses from other jurisdictions. The University of Athabasca has asked to be a BC member. This is under consideration, as is a policy for other provinces. A motion will be going forward to BCCAT in June to open up opportunities for Alberta institutions. It is expected that the criteria and conditions will be stringent, with the intent being to facilitate existing practice as opposed to recruiting students.

Richard DeMerchant asked if BCCAT could post information on the website providing information on how the new high school mathematics pathways are accepted at different institutions. Finola agreed to check into this.

3.2. PIMS—David Leeming

David provided the following report to the committee:

New PIMS Director
Dr. Alejandro Adem, Associate Director of PIMS, will become Director of PIMS on July 1, 2008, for a five year term, succeeding Dr. Ekeland.

PIMS Education Prizes for 2008
The two PIMS Education Prizes for 2008 were awarded to Dr. Harley Weston, Univ. of Regina and Virginia Warfield of the University of Washington. More details are on the PIMS website www.pims.math.ca .

PIMS Education Outreach Activities
- Math Mania (elem. Schools) – Victoria, Vancouver
- SNAP Math Fairs – Alberta
- Changing the Culture – SFU Vancouver
- First Nations math outreach (Melania Alvarez - UBC) – Britannia Secondary School, Sk'elep (North Kamloops), Lytton, Merritt, Port Alberni.

Pi in the Sky
Issue #11 is now in print and copies were made available at the BCcupms Meeting. Five copies are distributed to each high school in BC and Alberta. Recent Issue themes include 'math puzzles and games', 'mathematics and art', and 'Euler'. New in Issue #11 are two book reviews and an offer of $100 for the best solution to each of four problems submitted by a high school student. Participants were encouraged to consider submitting an article to Pi in The Sky.

PIMS Education Associates

Following on my PIMS Report to the BCcupms Meeting in Whitehorse last May, we have made significant strides on this initiative. Eight institutions in BC indicated that they were interested in pursuing the idea further. PIMS requested that we try to get a 'model' agreement in BC and in Alberta. As a result two institutions have already signed on as PIMS Education Associates. They are Camosun College in Victoria and Red Deer College in Alberta. The main points of the agreement are a $500 per year fee, a three-year term (renewable), and an opportunity to hold an education event at their institution, co-sponsored by PIMS.

In BC, the other seven institutions were sent a follow-up e-mail with information on these two agreements. These seven were encouraged to discuss this with me at this meeting if they wish to move forward to becoming PIMS Education Associates. Also, in Alberta, at least three more institutions are interested.

3.3. ABE—Costa Karavas

Costa provided this report from the Adult Basic Education Mathematics Working Committee Annual Articulation Meeting which was held at Camosun College, Victoria, BC, February 28-29, 2008.

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 Adult Basic Education math working group and their institutional contact information. See http://www.aved.gov.bc.ca/abe/handbook.pdf

Learning Programs Branch, Adult Literacy and Developmental Programs Unit, Ministry of Advanced Education, by Shelley Gilmour

- Establishing tuition-free adult basic education for all learners at the post-secondary level with annual funding of $6.9 million
- Funding support of $1.6 million for 16 full time Regional Literacy Coordinators attached to institutions in the college system to work with regional education partners for a coordinated approach and delivery of adult literacy services that meet unique community needs.
- Increased funding for the ABESAP (another $3 million in grants over the next three years) for developmental program students who need help to pay for books, supplies, and sometimes transportation and unsubsidized child care while attending a post-secondary institution.

Articulation of new and existing courses

- Intermediate level Math 033 (grade 10 level) from NWCC.
- Advanced level Math 043 (grade 11 level) from NWCC.
- Advanced level Math 052 & 053 (grade 11 level) from Selkirk College.
- Provincial level Math 062 & 063 (grade 12 level) from Selkirk College.

Specialized math courses for trades and other areas.

- TRU has a trades math course that is basic math, doesn't lead to any other courses.
- COTR has non-credit math courses to help students struggling in other courses – nursing, welding, ABE, etc. They are marketed as support courses.
- Malaspina has math for trades similar to TRU that leads to trades only.
- Selkirk has short math courses being developed to run for 2-3 weeks before trades courses.
- Yukon has a water math course – a short math course to give people skills to measure water quality, etc.
- CNC is working on a math for trades course that could be accepted instead of math 11 for trades courses.
- VCC and UCFV are doing a lot on Workplace Essential Skills.

Placement testing

A variety of programs are being used: COMPASS, Maplesoft, Accuplacer, traditional "paper and pencil" tests.

Following Costa's report, Richard DeMerchant mentioned the Adult Programme Guide that may be of interest to ABE departments. It will be posted on the ministry website later this year.

3.4. AMATYC—Slava Simice

Slava highly recommended the 2008 AMATYC conference, which will be in Washington DC, November 20 - 23.

3.5. Changing the Culture—Wayne Matthews

Wayne summarised the highlights of the 2008 Changing the Culture conference which was held on April 18 at SFU Harbour Centre. This year's theme was Mathematics: Beauty and Utility. John T. Baldwin, from the University of Illinois gave a talk on the use of variables in problem solving. There was a workshop led by Melania Alvarez-Adem and her colleagues on Lesson Study, an activity practiced in Japan that brings mathematicians, math educators and teachers together to design, teach, observe and revise lessons. A second workshop led by Justin Gray and Jamie Mulholland focussed on problem solving and the use of problems to motivate students and achieve learning objectives. A panel discussion on transition to university featured Rajiv Gupta (UBC), Jamie Mulholland (SFU), Ginger Warfield (University

of Washington), and Harley Weston (University of Regina). A talk by Natalie Sinclair (SFU) on Mathematics as Experience: Challenging Aesthetic Elitism closed the programme. Power point slides for the talks are available on the website which can be accessed from the PIMS site.

The date for next year's CTC conference was discussed in light of the Math Education Forum being planned for the end of April. It was suggested that it may be beneficial to schedule the two conferences back to back. Malgorzata Dubiel will check to see if this is possible.

4. BUSINESS ARISING FROM THE MINUTES OF THE 85th MEETING

4.1 Mathematics Flexible Pre-Major Update—Leo Neufeld

Leo reported on the update work performed on the Mathematics Flexible Pre-Major document by David Leeming, Wayne Matthews and himself. They contacted the eight institutions that offer a mathematics major and created a report based on the changes suggested by these institutions. He noted two small changes to the report as distributed. This information is now ready to be sent to BCCAT and will also be posted on the BCcupms website. Leo advised that this information needs to be kept up to date on an annual basis.

Motion: (moved by Malgorzata Dubiel and seconded by Costa Karavas)

That the Mathematics Flexible Pre-Major Requirements Update Report to the BCcupms be accepted as amended.

Carried (unanimously).

ACTION: Leo Neufeld will keep track of and update the Mathematics Flexible Pre-Major information for another year.

Bruce Dunham commented that it would be minimal extra work to include information for a Statistics Pre-Major.

ACTION: Bruce Dunham will create a similar table of course information for a Statistics Pre-Major option.

5. NEW BUSINESS

5.1 College-to-college articulation: An idea whose time has come?—Jim Bailey

Given the large number of students who transfer from college to college, Jim was inspired to create a list of all of the equivalent Calculus I and II courses across the province with the intention of providing this list to his Registrar. He explained that he would be happy to make this list more generally available so that this work would not have to be repeated at each institution. This information would be useful to students and could be made available on the BCCAT website under "Other Transfer Agreements".

ACTION: Jim Bailey will circulate a list of Calculus I and II (for Science) courses at all of the colleges and universities in BC on the listserve by the end of December or early January. Members will confirm the information for their institution, and the final version will be ratified at the 2009 BCcupms meeting.

It was noted that once approved this information will also need to be reviewed and updated annually. Institutions can provide any needed update information with their annual institutional reports.

Finola Finlay indicated that BCCAT could distribute the information to the Registrars' offices and informed the committee that money is available through BCCAT to fund any needed meetings to establish the list of courses.

5.2 New universities—Wesley Snider

Wesley opened discussion on the impact of the recent change of status of a number of institutions from university-colleges or colleges to universities. In general the new "special purpose teaching universities" were unclear on the effect that this change in designation will have. No big changes are expected in the short term. None of the institutions who were not already offering majors or minors in Mathematics expected to offer one in the short-term. There is no expectation of

additional funding. Marketing teams are busy designing new logos and BCCAT is preparing for the massive amount of work that will be required to update their websites.

5.3 Change of Math Contest Name to Honour Jim Totten

The members of the BCcupms discussed how Jim Totten's memory could best be honoured. Because of his instrumental role in promoting the BC Secondary Schools Math Contest it was suggested that Jim's name be incorporated into the name of the contest. However, after some deliberation, it was agreed that this would not be appropriate given the others who have also dedicated much appreciated time and energy to this project. The suggestion to name a math contest prize after Jim was also rejected as each institution has a different budget and procedure for handling prizes, and there was never an intent to have a top provincial prize that would compare students competing at different institutions.

Faye DeBeck suggested that the PD session following the BCcupms meeting next year could be devoted to Math outreach in recognition of Jim's work. Malgorzata informed the committee about a booklet of Jim's Problems of the Week that was recently published as part of the "A Taste of Mathematics" series, published by the CMS. These booklets could be given to Math Contest participants. They are available in bulk from the CMS.

ACTION: Faye DeBeck and the faculty at Thompson Rivers University will plan the PD events at the 2009 BCcupms meeting to honour Jim's contribution to mathematics education and outreach. Clint Lee will add the annotation "In Memory of Jim Totten" to the title page for the 2009 Math Contest.

5.4 Report of Nominating Committee for the Vice-Chair (one year) of the BCcupms:

Nora Franzova withdrew from the nominating committee. Leo Neufeld and Malgorzata Dubiel provided the names of three nominees for the position of Vice-Chair: Nora Franzova, Wayne Matthews and Wesley Snider. There were no further nominees.

Al Fukushima asked the committee if there was any interest in changing the structure of the committee executive and the current practice of electing the Chair in alternate years with the Vice-Chair and Secretary. It was suggested that if there was interest in this that a proposal could be submitted to the committee for consideration at next year's meeting.

An election was held and Nora Franzova was elected as the Vice Chair of the BCcupms for a one-year term.

Motion: (moved by Alan Cooper and seconded by Leo Neufeld)

That the ballots be destroyed.

Carried.

6. INSTITUTIONAL REPORTS

BCIT – Colin Lawrence
Nothing to report.

CAMOSUN – Wayne Matthews

1. MATH 107, Pre-Calculus for Business & Social Sciences, is off & running and has received UT from UVIC & other institutions. With a pre-req of C+ in Math 11, we're finding the success rate problematic for those students receiving that grade from non-standard institutions such as summer school, on-line learning, or learning centres.
2. Camosun has two 6-month bridging programs to 3rd yr engineering. One starts in the summer, for Civil, is to UBC and the other starts in winter is to UVIC for Mechanical and Electrical. We're in the process of having the math courses in these two programs, some of which are transferable, made identical. This will allow for greater flexibility for the students, and help the college to maximize and hopefully increase enrolment. We are a receiving institution for these courses.
3. Sept 2007 saw the delivery of MATH 100 to 31 students at Claremont Secondary. They each had the pre-req of a B in Math 12 during their grade 11 year. The course was team-taught by a Camosun instructor and the Calc 12 teacher at the school, and the students received dual credit for Calc 12 and MATH 100. The fee arranged was about 2/3 and the Camosun instructor taught approx 1/3 the time and was responsible for level of difficulty of assignments & tests. The students also came to Camosun twice to experience 2 of the MAPLE labs, and the other 3 labs the students did on their own at Claremont. It was successful and we plan to repeat the experience.

CAPILANO – Deanna Baxter

Course Changes: Nothing to report.

Enrolment Trends: Enrolment in Mathematics and Statistics courses fell by 10% from Fall 2006 to Fall 2007 and by 4% from Spring 2007 to Spring 2008.

Number of Academic "hours": Starting in Fall 2008, most of our courses will consist of 39 in class hours plus 13 supplemental activity hours such as tutorials and online activities which will vary from course to course.

In Fall 2007 and Spring 2008 our Math 190 (Math for Elementary Students) put on a "SNAP" Math Fair (http://www.mathfair.com) as their course project. Local elementary schools were invited to participate and the fair was geared toward grades 4 and 5 students. This project is now a permanent component of our Math 190 course. Currently, a documentary is being produced about the SNAP Math Fair by the Capilano College Film Studies program.

Our High School Mathematics Enrichment program which offers 6 sessions per year for local high school students continues to increase in popularity.

Ken Towson and Reimar Hauschildt will be returning from Paid Ed leave where they worked on a statistics textbook with a focus on sports. Chris Morgan is going to be on Paid Ed leave for the 08/09 year and Marsha Anderson is taking over as department coordinator.

COLLEGE OF THE ROCKIES – Jim Bailey

Course changes affecting transfer: none. We offered Business Calculus I rather than PreCalculus last semester; there has been some interest in Business Calculus II this fall as a result.

Enrolment trends: enrolment is stable.

Hours per term:
Calculus I: 3 hours lecture + 1 hour Maple lab + 1 hour tutorial per week times 14 weeks plus 3 hour final exam.
Intro Stats: 3 hours lecture + 1.5 hour computer lab per week times 14weeks plus 3 hour final exam.

COLUMBIA – Peter Hurthig

1. There are no changes in course offerings.
2. Enrolment for the Summer 2008 semester: Math 100 (PreCalculus):21 students, Math 111 (Calculus 1 for Business/Arts) 3sections: 25, 34 and 33 students. Math 112 (Calculus 2 for Business/Arts): 37 students, Math 113 (Calculus 1 for Science/Engineering): 12 students, Math 114 (Calculus 2 for Science/Engineering): 20 students, Math 252 (Linear Algebra): 14 students.
3. Each course has 4 hours of lectures per week for 13 weeks for a total of 52 hours.

The enrolment is down by about 10%.

COQUITLAM – Gera Belchev

Course changes: There are no course changes to report.
Enrolment: Over the past year enrolment seems to have stabilized.
Course duration: During fall and winter semesters a course has 48 one-hour classes or 57.6 fifty-minute classes; during summer there are 44 one-hour classes or 52.8 fifty-minute classes.

DOUGLAS – Wesley Snider

The budget cuts announced by the Provincial Government in March will result in a 2.5 section reduction in our department over this fiscal year. This will negatively impact our probationary faculty.

The abundance of universities in the lower mainland leaves us to wonder what the role of the community college will be in the future and what direction our planning should take.

Work continues on our on-line statistics course for Health Science students. We hope to pilot a section in Winter 2009.

We will be conducting a feasibility study into a Post-Degree Diploma in Mathematics and Science Teaching. This would be a programme for in-service teachers with minimal science or mathematics background who may find themselves teaching a math or science course. The study will commence this Fall.

We ran our Calculus I course at Centennial Secondary again this year. We had hoped to have other interested secondary schools send students but the location proved difficult. We will attempt to have these students come to our campus in future to allow for more schools to take advantage of concurrent studies. We are hoping for five or six Grade 12 students from New Westminster Senior Secondary join us as concurrent studies students in Fall.

FRASER VALLEY – Susan Milner

Changes: There were only a few changes in our course offerings or programs this past year. Most significantly:
As directed by our board, the requirement that prerequisite high-school math courses be provincially examined has been dropped. So, for example, the prerequisite for Calculus I is now a B in Math 12, based solely on the internal high-school grade. Our protests about this at the Senate level earned us a promise of some funding for "student support" this coming year, and we have had that confirmed. We have plans for a peer-mentoring/tutorial system.

Several of us used WebAssign this past year. We are in general quite pleased with the results: there's a lot more homework being done than before, and we have seen an improvement in student performance on exams. The students have reacted, on the whole, quite positively. Next year we will be implementing it across all of our calculus sections.

We have designed a new course "Math 120, Finite Math with Applications in the Information Sciences" for our Computer Information Systems department. It is designed to provide an effective and efficient route for many BCIS students (entering with Math 11, typically) to prepare for the mathematics requirements of their degree. This replaces some of the more pre-calculus oriented courses which the students currently take.

Of course the largest change is still forthcoming, as a result of our university status. There are no immediate changes planned for our courses or programs, but we do anticipate a greater ability to market our programs properly and ultimately a corresponding increase in enrolment.

Enrolment: University-wide enrolment is down slightly. Math enrolments are up about 8% over last year.

Hours: All first-year courses at UCFV are four credits, which translates into 3 blocks per week x 80 minutes per block x 13 weeks = 62.4 academic hours per semester.

KWANTLEN – Michael Nyenhuis

- Kwantlen will be known as Kwantlen Polytechnic University after September.
- Enrolments at Kwantlen continue to decline. Five years ago we were able to run 12 full sections per term of Precalculus, our most popular course, this year we will run only 8, and they may not fill.
- The number of hours in each of our calculus and stats courses is 4 per week, and our terms are 14 weeks long, not taking holidays into account.
- We will be starting a Math Lab for Precalculus in September. Students will drop-in to the Math Lab for an hour, write a lab, and get help in doing so. We originally wanted a separate course (Math 1110), but because it has to be implemented quickly, for this year it will be incorporated into Math 1112.
- The B.A. with a Math Minor started this year, and we expect our first graduate at the end of summer. The degree is for students who need some math, but do not need a conventional B.Sc. The intended audience is people such as future high school teachers.
- The prerequisites for Math 1190, Math for Elementary Educators, will be changed to make enrolment easier for students who already have a Bachelors degree, and therefore presumably have adequate study skills. At present, our (much abbreviated) prerequisites are (Principles of Math 12 with a C+, or equivalent) OR (18 Kwantlen credits numbered 1100 or higher and Principles of Math 12 with a C, or Principles of Math 11 with a B). The proposal is to add a third category: a Bachelors degree.

LANGARA – Nora Franzova

Registration: For the Spring and Summer semester registration for the college is consistent, no major ups or downs. Math registration is also at the level from previous year. Since Langara now has a BBA, the business math classes have increased, but not Business Calculus. Second year science course (physics namely) have a hard time to fill up, so they are being put on hold, which might influence registration for upper level math classes in the near future.
Few new people were hired as temporary replacements of colleagues that are on leave.

New/ Old: Department approved increased a prerequisite requirement for going from our Precalculus course into our Business Calculus course from C - to C+. Still needs to be approved by the college to come into effect.

Provincial Exams Approach: The college dropped the Math12 Provincial exam from its requirements and so the math department will for now take THE BEST OF: School grade and Blended Grade (if the student has taken the provincial). We will see how is that going to work out.

Transfer Agreements: There have been no new transfer arrangements established this year.

How many teaching hours in a usual first year Calc and Stat course? These classes are taught 4 hours (55 minute) per week for about 12-13 weeks, minus holidays. All of those hours are in class lecture hours.

MALASPINA (Vancouver Island University) – Glen Pugh

1. Number of sections offered has decreased, the result of
   - institution wide budget cuts; addressed by eliminating some partially subscribed sections thus filling up sections remaining;
   - drop in the Malaspina Education program math entry requirement from 6 to 3 credits, resulting in large enrolment drop in Math for Elementary Education II.
2. Our Math Minor is experiencing slow but steady growth in students obtaining the minor as preparation for teaching at the senior level. The effect of the BC-Alberta Trade, Investment and Labour Mobility Agreement (TILMA) on this positive trend is a concern for us. Upper year offerings for 08/09 include Geometry, Cryptography, History of Math and Problem Solving. Students in the Problem Solving course will be encouraged to write the Putnam Mathematics competition in December following the course.
3. We are implementing a no-calculator policy for Calculus I beginning with the Fall 08 term.
4. Minimum B in Principles of Math 12 now required for entry to Calculus I.
5. Enrolment continues to soften.
6. 50 minute blocks per term:
   - Calculus I: 13x4=52
   - Intro Stats (no lab): 13x4=52
   - Intro Stats (with lab): 13x5=65

   (subtract 2 or so hours for holidays)
7. Chair Ian Bailey has stepped down and David Bigelow is the new chair.

NEW CALEDONIA – Rob Miller (report submitted by Nicolas Buck)

Personnel

Last summer Edward Dobrowolski retired after 18 years at the College and has been replaced in a full-time regular faculty position by Rob Miller. This summer term, Dr. Dobrowolski will be teaching two courses on a part-time basis.

Concerning item 6. in the Plenary Session

(a) The mathematics department currently has the following three proposals due for consideration at the May 20th meeting of the College's Education Council:

i) to introduce a first-year calculus course for non-science (typically commerce) majors along the lines of those found in most universities and many colleges (e.g., UNBC Math 152);

ii) to increase the number of hours in the first-year introductory statistics course from three to four lecture hours per week; and
iii) to discontinue the one-half hour per week laboratory component (i.e. Maple software) of the first-year calculus sequence.

If the first proposal is adopted, then we will initiate the usual articulation process with the various schools that offer such a course.
The second proposal has no bearing on transfer credit since the intention of the proposal is simply to allow more time for the already substantial amount of material in that course.
The third proposal has no bearing on transfer credit since the original transfer agreements did not include such a component (and not all schools teach Maple anyway).

(b) At this stage, overall enrolment in mathematics courses appears to be down slightly from last year but the trend may be mildly (concave) up over recent years. Enrolment is up in the introductory statistics course because enrolment in health sciences has increased. Over the last few years general enrolment at CNC is down in university transfer, business, and technologies, but up slightly in health sciences and trades.

(c) The number of weeks per term is not constant, but assuming a 13-week term there are 52 "hours" in the first-year calculus courses, and 39 in the introductory statistics course.

Mathematics Contest

We conducted our usual small, humble, local version of the provincial high school mathematics contest and a jolly time was had by all (especially the winners, I guess)

NICOLA VALLEY INSTITUTE OF TECHNOLOGY—Al Fukushima

Courses offered:

College Readiness (60- 75 hours per semester – 2 hour blocks)

- 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 (45 hours per semester 1.5hr blocks)

- Math 110 (Finite Math) - Unsubscribed
- Math 120 (Introduction to Statistics) - Unsubscribed

Administrative Studies (45 hours per semester, 1.5 hr blocks)

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

(a) No new courses nor changes that may affect transfer agreements
(b) Enrolment tends to be flat – maintaining enrolment numbers

NORTH ISLAND – Slava Simice

1. Calculus is taught: 3 hours lecture + 2 hours Maple lab.
2. Enrolments in University Transfer Program were considerably down.
3. Some of the changes for 2008/2009 are:
   a) Suspending Computer Science & Information Technology programs.

b) Reducing selected first and second year University Transfer offerings, where enrolments have been poor over time, and where the courses are available at other college locations and/or through other delivery methods. Course offerings will be reduced in first and second year English, first year Media and Communications Studies, second year Psychology, first and second year Political Science, first and second year History, first and second year Math, and developmental Math and Physics.

c) Suspending face to face delivery of advanced and provincial level Adult Upgrading and University Transfer programming in English, Math and Science at the Port Hardy Campus, due to decreasing local enrolments and changing local demands.

d) Offer a new program in Interactive Media and Graphic Design, beginning September 2008. This non-traditional program combines web development and graphic design, and uses existing faculty expertise to deliver a new credential that is in high demand.

NORTHERN LIGHTS – Hongbin Cui

New Course: We offered a new online course: Math 104: Introduction to Statistics for the past winter semester. But the enrolment in the online course was very low.

Enrolments: Enrolments in general have been low for the past several years.

Hours in Calculus I and Introduction to Statistics: There are three (3) lecture hours plus one (1) lab hour each week. The actual number of teaching weeks is around 13.5.

NORTHWEST – Mona Izumi

- Enrolments continue to decline. Calculus I and II continue to be offered in both Prince Rupert and Terrace as well as Intro Stats at both campuses. Math for Elementary Teachers is delivered face to face in Terrace and online to the rest of the region.
- The Business Administration department now offers its own statistics course which has resulted in lower numbers for our Intro Stats course.
- Precalculus was cancelled due to low enrolment.
- Taking a page from Douglas' book, we have articulated a math course for Arts students.
- We participated in the Math Contest again. Thank you to David Leeming for coming as guest speaker.

OKANAGAN – Clint Lee

Courses:

- The department is planning to introduce a second-year course MATH 231: Introduction to Cryptography. The course will go to OC Education Council in the Fall of 2008 and we hope to offer it for the first time in Winter 2009. In addition to offering another second-year option for mathematics students, we hope it will be a popular elective for OC's Bachelor of Computer Information Systems degree.
- The department is planning to offer a directed studies course at the second-year level, MATH 290. We anticipate that this course will be offered infrequently, but we see such a course as a very valuable educational experience for a strong student.
- There have been no significant revisions to existing mathematics and statistics courses in 2007-08.

Enrolment Trends:

- In the three years of Okanagan College's existence, mathematics and statistics enrolments have been stable. There have been enrolment fluctuations from course to course, from year to year and from Region to Region, but no clear trend has emerged. This year, across Okanagan College, applications lag last year numbers by about 12%, but in Arts and Science, Business and the Technologies, the areas that generate mathematics and statistics enrolments, the decrease is somewhat less. My best guess (and it is a guess) is that, in 2008-09, math and stat courses will experience a modest decrease in enrolment.

Contact hours in Calculus 1 and Introductory Statistics:

- MATH 112 (Calculus 1). The format for all sections is 4 lecture hours and 1 MAPLE lab hour per week.

- Okanagan College teaches three statistics courses which can be considered introductory: STAT 121 (Elementary Statistics) mostly for Arts students, STAT 124 (Business Statistics) for OC BBA students and Business Administration diploma students and STAT 230 (Elementary Applied Statistics) for Science students. The format for all three of these courses is 3 lecture hours and 1 computer lab hour per week.

Faculty:

- We have recently hired Dr. Satoshi Tomoda (Ph.D., University of Calgary) to a continuing appointment.
- We expect to hire a second continuing appointment later this summer, probably at the Penticton campus.
- We also anticipate that, in January 2009, the OCFA Collective Agreement will result in the regularization of a term faculty member to a continuing position. At that point, the department will have achieved one of its major goals – a full complement of continuing faculty.

SELKIRK – Bevan Ferreira

This year will probably be the last year that Math 130 and 131 are offered on their current form. We are currently reviewing these courses, as they are not transferring in the best possible way for our students at this time. Math 130 currently fills as a College Math course for the Arts and Social sciences (and for ECE) as well as attempting to satisfy the requirements for our Business Administration programme. In the same way, Math 131 is both an introduction to probability and statistics for our business students, and a second College Math course for others.

We are looking at replacing Math 130 with a Math for Elementary Ed. and also with an introductory course in Mathematics for Business (Business Math I). In addition, Math 131 will most likely be absorbed into our existing Introductory Statistics course, Stat 105. It is anticipated that this will be beneficial to our Business students, and also remove duplication between Math 131 and Stat 105.

This Fall, we will offer our first edition of Stat 105 as an online course, but in light of the issues raised around online courses at BCCUPMS this May it should be pointed out that this will replace the current distance version of this course.

Our online version of Math 100 for Transitions has been having great success among our local (and regional) High Schools. Again the issues raised around online courses do not apply here, as the students are supervised by teachers locally. Again, this has replaced the purely distance version of this course, with no other changes around content nor delivery.

We continue to hope for our offerings to expand to include a Discrete Math course, and an Analysis course, so as to enable us to offer a complete flexible pre-major in Mathematics.

SFU – Malgorzata Dubiel

1. Retention is a big word at SFU these days, and it has inspired several curriculum initiatives. Our department has introduced a new Calculus Support Program, first piloted in the Summer 2007, and introduced in all first year Calculus courses in the Fall 2007. All Calculus students are required to take a diagnostic test during the first week of classes. The results of the test, which is a version of our Calculus Readiness Test (see http://www.math.sfu.ca/ugrad/calctest/), make up 5% of the course grade. The students who scored low on the test can make up the percentage by participating in the program, which consists of weekly algebra review sessions, and pre- and post-tests. The data for the 07/08 academic year indicates that the students participating in the program do much better in their Calculus courses than students with the same high school grades and diagnostic test scores who do not. The big issue is how to make all students with low diagnostic scores to participate in the program.
2. We have increased prerequisites for our most challenging Calculus I course, MATH 151, to A-, mainly because of retention concerns – this course had a high failure rate.
3. We have redesigned our Precalculus course, MATH 100, and changed the textbook, in an attempt to make it a better transition to calculus course. See the course outline at http://www.math.sfu.ca/courses/math100.shtml.
4. Our FAN X99, Foundations of Analytical and Quantitative Reasoning course, is in its second year, and the enrollment has been steadily increasing, since it is one of the requirements in the new SFU undergraduate curriculum for students whose Principles of Math 11 grade is below B.
5. We have thoroughly redesigned our MATH 190 Distance Education course and have introduced it in Summer 2008, after over two years' break. The new course, based on a new textbook, Reconceptualizing Mathematics (Preliminary Edition), by Sowder, Sowder & Nickerson, seems to be a big success.
6. We have reintroduced MATH 313, Differential Geometry.
7. We continue to offer two very successful outreach programs for high school students: SFU Summer Math Camp, offered at both our Burnaby and the Surrey campuses during the last week of June (see http://www.math.sfu.ca/outreach/schools/camp/), and A Taste of Pi, offered during the school year at the Burnaby campus (see http://www.math.sfu.ca/atasteofpi/).
8. SFU is the host of 2008 Calculus Challenge Exam. For details and the report, see http://www.math.sfu.ca/outreach/schools/challenge/.

THOMPSON RIVERS – Shane Rollins/Fae DeBeck

Faculty:

Chair: Shane Rollans

For the current academic year we had 17 full-time and 3 part-time faculty. Dr. Sean McGuinness and his wife, Dr. Suzanne Feldberg joined us in August. Sean has a full-time appointment and Suzanne taught a section of Calculus via ITV.

We lost our dear friend and colleague, Dr. Jim Totten, in March and we are all missing him greatly.

Dr. Don Noakes' term as Dean of our School will end in August and he will be joining us as a faculty member. Don has a strong statistics background and we are delighted to have him in our department. An interim dean will be selected from internal candidates.l

Externally funded research includes five NSERC grants and one contract for IHA.

Dave Tomkins received a Teaching Excellence Award from TRU.

Enrolment:

Enrolment is stable but this is due to an increase in business math courses balancing a decrease in science courses. For the first time in several years we are not offering Calculus 1 in Summer session.

Program and Course Development

A joint major in Mathematics and Economics for the BA or BSc has been developed. It is not yet approved but it will be going ahead.

Math 170 – Discrete Math 1 ran for the first time in Fall 07 and the feedback was positive. Math 270 – Discrete Math 2 will be offered for the first time in Fall 08.

Our honours degree proposal was approved last year and four students are graduating with Honours degrees this spring. As a result of the honours program we have offered four or five Selected Topics courses. Three students have enrolled in graduate studies and two students who graduated last year have received NSERC post-graduate scholarships.

We do not have a master's degree program in Mathematics but we have faculty participating in the MSc. Program in Environmental Studies. Also we have faculty supervising graduate students at UVIC and UNBC.

In reference to the request for information on academic hours for Calculus 1, we have 52 hours including weekly seminars and excluding holidays in each regular semester. The standard timetabling is MWF lectures and a seminar on a Tuesday or Thursday. We also offer a few sections with 65 hours excluding holidays. These consist of daily classes M-F.

Issues

Since becoming a university we are still struggling with issues surrounding promotion, tenure and salary, equitable workload, and research support. With the four new universities coming on stream we anticipate increased pressure on enrolment – there will be more competition for students.

The new teacher certification requirements may cause a decrease in enrolment in upper level courses.

THOMPSON RIVERS (OPEN LEARNING) – Veda Abu-Bakare

TRU-OL is now in its third year of transition from the BC Open University to being a Division of TRU. Our Math and Stat courses continue to be updated and aligned with the face-to-face offerings of TRU-Kamloops. We are presently developing an Open Learning Math 190, Math for Elementary Teachers.

TRINITY WESTERN – Richard Atkins

UBC (Okanagan) – Qiduan Yang

Changes: A new course was introduced, called MATH 126: Basic mathematics: An Aboriginal Perspective. The course description states as follows:

> Topics used in university courses: algebra, functions, graphs, basic geometry, trigonometry, exponential and logarithmic functions. Employs cyclical process of analysis and synthesis common to some Aboriginal cultures. Restricted to first-year students. Cannot be counted for credit toward the B.Sc. degree. Credit will not be granted for both MATH 126 and MATH 125. [3-0-1]
>
> *Prerequisite:* Mathematics 11 or equivalent.

Enrolment: The enrolment of two Calculus 1 courses, MATH 100 for Science and MATH 116 for management and economics, is up slightly from September 2006 to September 2007. The numbers are shown in the following table.

Course	Student number in	Student number in	% of increase

	Sep. 2006	Sep. 2007	
MATH 100	385	415	7.7
MATH 116	138	155	12.3
Overall	523	570	9.0

Hours: MATH 100 (Calculus 1 for science students) has three lectures (50 minutes each) per week plus 1 hour of computer lab work and tutorial.

MATH 116 (Calculus 1 for management and economics) has 4 lecture hours (50 minutes each) per week.

UBC (Statistics) – Bruce Dunham

This year saw a bumper number of students graduate on Statistics programs at UBC, with a total of 37 graduating. Exact figures appear to be unavailable for previous years, but the 07/08 number is possibly a record for our department and certainly in excess of totals from recent cohorts.

In January 2008 we had a departmental review, a process that occurs at approximately five-yearly cycles for departments at UBC. The visiting team reported favourably on our undergraduate program and our moves to enhance our teaching and learning methods. Discussions by the team with current undergraduates indicated an apparent dissatisfaction with the number of upper-level electives offered. To remedy this, next year we will run STAT 335 (Statistics in Quality Assurance) and STAT 442 (Statistical Methods for Categorical Data), both of which appear in the UBC calendar but have not been offered for several years. There are tentative plans afoot to revise our curriculum substantially, which may lead to additional courses being created, though whether this goes ahead will be determined by the priorities of the new head of department. At the time of writing the present head, Prof Will Welch, is nearing the end of his term and there has been no firm decision regarding his replacement.

This year saw the first offering of a new course, STAT 100 (Statistical Thinking). This course is not pre-requisite for any subsequent courses, and is also available to students who have taken some upper-level STAT courses. The enrolment was capped at 45, and the course quickly filled this target, although ultimately only 37 completed. The course was deemed a qualified success by the five faculty members involved, and the enrolment cap will be lifted to 60 for the next academic year. Students transferring to UBC should be made aware of STAT 100 as an interesting elective course. There is a proposal to offer the course in the Summer session in 2009.

As part of the Carl Wieman Science Education Initiative (CWSEI), our department received funds to "transform" STAT 200, our largest introductory course in terms of student numbers. Approximately 800 students take this course each year, nearly all from the Science faculty, and in 2007/08 we offered six sections. The transformation involved the development of detailed learning outcomes for the course, the creation and implementation of a pre- and post-course attitudinal survey, interviews with students who have taken both the transformed and pre-transformed versions of the course, substantially revising the lab activities and the adoption of PRS (personalised response systems, or "clickers") in the lectures. The impact of these measures has yet to be properly gauged, although initial impressions are positive. Hopes are high that further funding will be made available from CWSEI to facilitate transformations for most of our UG courses, and perhaps also to enable us to devise effective methodology for educational research.

Traditionally our courses approximately 48 fifty-minute contact "hours", typically three hours per week plus a lab/tutorial/seminar session.

Further details on any of the above can be obtained by either visiting www.stat.ubc.ca or contacting Dr. Bruce Dunham at b.dunham@stat.ubc.ca.

UBC (Vancouver) – Wayne Nagata

1. UBC has introduced a new course UBC MATH 110, a 6-credit precalculus and differential calculus (Precalc + Calc I) course, that runs over two terms. This is supposed to give an option to students who do poorly in September assessment tests given in the Calc I courses UBC MATH 180 and 184. The plan is to start MATH 110 later in the fall so students can drop MATH 180/184 and add MATH 110 without missing the first part of MATH 110. Probably this course would be considered equivalent to a one-term Precalc course plus a one-term Calc I course for articulation purposes.

2. UBC has introduced a Dual Degree program, B.Sc. Math plus B.Ed., that normally would take five years to complete. (A similar program for Physics has been introduced at the same time.)

3. The course UBC MATH 307 (Applied Linear Algebra) has been changed so that it now will seriously consider applications to science and engineering, as well as use computers for solving problems. This is a majors-level course. Two theoretical linear algebra courses have been created, UBC MATH 310 (majors-level) and MATH 412 (honours-level). These two courses emphasize proofs.

4. Three credits usually correspond to thirty-six 50-minute lectures, three per week, over one term (12-13 weeks). For example, UBC MATH 100 (Calc I for students with B.C. Secondary Calculus 12) is three credits, while UBC MATH 180 (Calc I for students with B.C. Secondary Principles of Mathematics 12) is 4 credits: thirty-six 50-minute lectures plus 12 or 13 weekly 1.5-hour mandatory problem-solving workshops. Previously, MATH 180 had forty-eight (in most years) 50-minute lectures and optional weekly tutorial sessions.

UNBC – Jennifer Hyndman

UVIC – No representative sent

VCC – Costa Karavas

- *Calculus I (Math 1100), Calculus II (Math 1200)* and *Introduction to Statistics (Math 1111)* are offered every semester by the Mathematics Department. The number of sections that will be offered next fiscal year will be reduced due to a decrease in enrolment.

- During the summer term (May-June), *Calculus I, II* and Statistics are offered 2 hours/day, 4 days/week.

- *Introduction to Statistics (Math 1111)* is a popular course, as it serves as a prerequisite course for the Dental Hygiene program, and will also be offered for the Bachelor of Nursing program commencing in 2009.

- Building expansion at the Broadway campus is well underway. The new building will be hosting Health Science programs.

YUKON – Tim Topper

Following the reports Jennifer Hyndman queried the committee about how their institutions handle overqualified students who wish to register in Math for Elementary Teachers. Deanna Baxter reported that Capilano requires students to provide a letter from the school where they are doing their volunteer work to ensure that they intend to become elementary school teachers. At Douglas and Camosun overqualified students are not turned away, but because of the workload involved it is not usually taken by students who are not really interested. Simon Fraser does not allow students who have already taken calculus to take the course for credit unless they have permission. Sometimes they require that a student take a couple of education courses before this is granted. It can also not be counted as a Math course towards a major. Kwantlen has experienced the opposite problem. Mike related that they have Alberta teachers who are interested in taking the course, but who do not have the high school math prerequisite.

7. COMMITTEE BUSINESS

7.1 Theme for our 87th Meeting

Suggested topics for the 87th meeting included: math for business courses, First Nations initiatives, calculus retention issues, transfer from high school, and transferability of courses that don't have textbooks. Members are invited to send other ideas to Jim Bailey.

7.2 Date and Location of the 87th Meeting

The 87th meeting will be held at Thompson Rivers University in Kamloops, May 12 – 14, 2009.

In 2010 it will likely be at Simon Fraser University followed by Okanagan College in 2011.

7.3 List Updates: E-mail.

Members were asked to ensure that addresses on the email list are correct. Telephone and fax number lists are no longer maintained online. Please keep Ian Affleck up to date with your information and contact Leo Neufeld for changes to the listserve.

To send a message to the listserve, send the email to: bccupm@lists.bccampus.ca. This will be changed to bccupms@lists.bccampus.ca soon.

7.4 Paying for the Website

The committee discussed how to handle payment of the $35 annual fee for the website domain name. There were several suggestions including asking the host institution to pay, collecting money from each institution annually, or rotating responsibility. In the end a collection was taken up and $26.25 was collected. Susan Milner will put this money towards this year's payment.

8. Adjournment of the Wednesday session

The Wednesday Session of the 86th meeting of the BCcupms adjourned at 4:07 p.m.

Many, many thanks to Nora Franzova and the Mathematics Department at Langara College for all their work in hosting us for this meeting. (The soup was delicious!)

List of Committee Members Present Plenary Session – Tuesday, May 13, 2008 (a.m./p.m.); Concurrent Math/Stats – Tuesday, May 13, 2008; Secondary Teachers Session – Tuesday, May 13, 2008; Plenary Session – Wednesday, May 14, 2008(a.m./p.m.)

Name	Institution	TUES	MATH	STATS	TEACHER	WED
Veda Abu-Bakare	Langara College/ Thompson Rivers University (Open Learning Division)	p.m.		X	X	X
Ian Affleck	University (College) of the Fraser Valley		X			
Richard Atkins	Trinity Western University	X	X		X	p.m.
Jim Bailey	College of the Rockies (Vice Chair)	X	X		X	X
Deanna Baxter	Capilano College	X	X		X	X
Eugene Belchev	Langara College		X			
Gera Belchev	Coquitlam College	X	X		X	X
Magnus Birkner	Helpful Math Tutor m101m Inc./Vancouver School Board Continuing Education				X	
George Bluman	University of British Columbia (Vancouver)	X	X		X	
Katharine Borgen	Prince of Wales Secondary, Vancouver School Board				X	
Alan Cooper	Langara College	X	X			X
Hongbin Cui	Northern Lights College	X	X		X	
Natasha Davidson	Douglas College					X
Fae DeBeck	Thompson Rivers University	X	X		X	X
Richard DeMerchant	Ministry of Education	X	X		X	a.m.
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	X
Finola Finlay	BC Council on Admissions and Transfer					a.m.
Michael Finnigan	Yale Secondary School				X	
Sara Forsey	Vancouver School Board	p.m.			X	
Nora Franzova	Langara College	X	X		X	X
Al Fukushima	Nicola Valley Institute of Technology	a.m.		X	X	X
Justin Gray	Simon Fraser University	X	X		X	
Reimar Hauschildt	Capilano College	X		X	X	X
Peter Hurthig	Columbia College	X	X		X	X
Jennifer Hyndman	University of Northern British Columbia	X	X		X	X
Mona Izumi	Northwest Community College	X	X		X	X
Costa Karavas	Vancouver Community College	a.m.		X		a.m.
Lisa Lajeunesse	Capilano College	X	X		X	
Colin Lawrence	BC Institute of Technology	X		X	X	X
Clint Lee	Okanagan College	X	X		X	X
David Leeming	Pacific Institute for Mathematical Studies	p.m.	X		X	a.m.
Eugene Li	Langara College			X		
Dave Lidstone	Langara College	p.m.	X		X	
Colin Macleod	Kwantlen University College	a.m.		X		X
Wayne Matthews	Camosun College	X	X		X	X
Rob Miller	College of New Caledonia	X	X	X	X	X
Susan Milner	University (College) of the Fraser Valley (Chair)	X	X		X	X
Chris Morgan	Capilano College	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
Maggie Przyborowska	Windermere Secondary, Vancouver School Board				X	
Glen Pugh	Malaspina University College	X	X		X	X
Michele Roblin	BC Association of Mathematics Teachers	X	X		X	

Name	Institution	TUES	MATH	STATS	TEACHER	WED
Shane Rollans	Thompson Rivers University			X		X
Geoff Salloum	Camosun College	X		X	X	X
Slava Simice	North Island College	X	X		X	X
Wesley Snider	Douglas College	X	X		X	X
Tim Topper	Yukon College	X	X		X	X
Larry Weldon	Simon Fraser University—Statistics (Retired)					p.m.
Qiduan Yang	University of British Columbia (Okanagan)	X	X		X	X

* The University of Victoria did not send representatives to this meeting.

List of Participants (Professional Development Sessions (Mathematics)) – Thursday, May 15, 2008

Name	Institution
Veda Abu-Bakare	Langara College/ Thompson Rivers University (Open Learning Division)
Marsha Anderson	Capilano College
Jim Bailey	College of the Rockies
Deanna Baxter	Capilano College
Alan Cooper	Langara College
Natasha Davidson	Douglas College
Bruce Dunham	University of British Columbia—Statistics
Bevan Ferreira	Selkirk College
Al Fukushima	Nicola Valley Institute of Technology
Jennifer Hyndman	University of Northern British Columbia
Mona Izumi	Northwest Community College
Julie Johnston	Capilano College
Lisa Lajeunesse	Capilano College
Colin Lawrence	BC Institute of Technology
Clint Lee	Okanagan College
Susan Milner	University (College) of the Fraser Valley
Rob Miller	College of New Caledonia
Chris Morgan	Capilano College
Dave Murray	Okanagan College
Michael Nyenhuis	Kwantlen University-College
Susan Oesterle	Douglas College
Glen Pugh	Malaspina University College
Tim Topper	Yukon College
Qiduan Yang	University of British Columbia (Okanagan)

BC Secondary School Mathematics Contest 2008
Report to the BCCUPM

On May 2, 2008 the Final Round of the BC Secondary School Mathematics Contest was written at 10 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)
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) on the Final Round at each institution.

Institution	Final Round		Top Three Scores		Averages	
	Juniors	Seniors	Junior	Senior	Junior	Senior
Cam	15	11	98, 88, 80	66, 64, 51	50	38
Cap	30	26	86, 85, 84	81, 78, 76	52	54
CNC	28	14	44, 43, 36	47, 44, 39	NR	NR
Doug	16	15	98, 86, 70	90, 89, 84	47	59
Lang	14	11	76, 75, 67	64, 62, 60	44.8	43.4
MUC	43	36	81, 62, 46	65, 60.5, 59	23.4	28.2
NWCC	9	8	52, 31, 28	52, 48, 44	24.5	32.3
OC/UBCO	35	25	63, 48, 42	96, 65, 62	23.9	34.8
TRU	31	29	70, 42, 28	59, 50, 42	19.0	26.2
UCFV	49	31	83, 81, 75	79, 76, 64	32.7	33.7
TOTAL	270	206				

Approximately 1385 Juniors and 875 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 476 students participated in the Final Round this year, down slightly from last 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 is administered on the morning of May 2, with some type of activity provided for the sponsoring teachers, and, after the contest is completed, lunch is provided for all participants. After lunch the activities vary. Some institutions have talks for the participating students and teachers, others combine talks with other activities, such as a math relay or scavenger hunts. During the time that the afternoon activities are taking place, the tests are marked, and later in the afternoon prizes awarded. The prizes vary among institutions. Some institutions give book prizes to all or selected participants; some institutions give cash prizes and/or scholarships to winners; many give 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 the involvement of their local 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; Dan Henschell at Douglas College; Ken Collins and Nora Franzova at Langara College; Patrick Ng at Malaspina University 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 do NOT do all the work required to make this contest a success. Indeed, they have indicated that their entire departments are involved with hosting the contest. Special thanks should go, as usual, 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 at other end of the country He works hard to bring 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 Yukon College last May in Whitehorse to put together the initial drafts of the contest papers are: Wayne Matthews and Chris Odgers (Cam), Jim Bailey (COTR), Nicholas Buck and Edward Dobrowolski (CNC), Clint Lee and David Murray (OC), Susan Milner (UCFV), Nora Franzova (Lang), and Mona Izumi (NWCC).

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 (UCFV), Chris Odgers (Cam), and Nicholas Buck (CNC). The solutions were prepared and typeset by Jim Bailey (COTR), Leslie Corbett and Satoshi Tomada (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.

Funding of the province wide activities associated with the BCSSMC, in particular travel of speakers from one institution to the other for Final Round activities and by the BCSSMC Provincial Coordinator, currently Clint Lee, to the BCCUPMS meeting for problem preparation sessions, has been generously provided by the Pacific Institute for the Mathematical Sciences, PIMS.

This report, together information on winners from the individual institutions, will be posted on the BCSSMC web site at people.okanagan.bc.ca/2008/MathContestBCCUPMReport_2008.htm.

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

For those planning for next year, the dates I am suggesting for the 2009 contest are:

Preliminary Round:	Wednesday March 4, 2009
Final Round:	Friday May 1, Thursday May 7, or Friday May 8, 2009

Respectfully submitted to the BCCUPMS on May 13, 2008 by

Clint Lee

ADDENDUM: The date for the final round was subsequently set for Friday, May 8, 2009.

MINUTES OF THE STATISTICS SUBCOMMITTEE
86TH BCCUPMS MEETING, MAY 13 – 15, 2008

TUESDAY, MAY 13TH, 2008

Present: Veda Abu-Bakare (Langara College and Thompson Rivers University – Open Learning Division), Bruce Dunham (University of British Columbia Vancouver), Bevan Ferreira (Selkirk College), Al Fukushima (Nicola Valley Institute of Technology), Reimar Hauschildt (Capilano), Costa Karavas (Vancouver Community College), Colin Lawrence (British Columbia Institute of Technology), Eugene Li (Langara College), Colin Macleod (Kwantlen), Rob Miller (College of New Caledonia), Shane Rollans (Thompson Rivers University), Geoff Salloum (Camosun College)

Chair: Bruce Dunham

Acting Secretary: Geoff Salloum

1. Approval of Agenda

Motion: That the agenda be adopted as proposed. Moved by Colin Lawrence and seconded by Al Fukushima. **Carried unanimously.**

2. Approval of minutes of the Statistics Subcommittee Session of the 85th meeting

Motion: That the minutes of the Statistics Subcommittee from the 85th Articulation meeting be approved without any changes. Moved by Colin Lawrence and seconded by Al Fukushima. **Carried unanimously.**

3. Matters arising from minutes

No matters concerning last year's minutes were raised.

4. Institutional Reports

Camosun College

Enrolment has declined over the past year resulting in a loss of three sections of Statistics courses. Four students completed an online version of Math 116 – Elementary Statistics in the Fall term with less than impressive results. The students were required to pass the final exam, which was written in person at the College. A larger and more successful section of the course (25 students) was run in the Winter term and was supplemented with weekly face-to-face tutorials.

Capilano College

Enrolment: Although there has been a gradual decline in enrolment in UT courses and mathematics courses generally, we were able to run 4 fully enrolled sections (142 students completed the course) of Math 101 (Introduction to Statistics) in Fall 2007-Spring 2008. After low enrolment caused us to cancel Math 205 (Introduction to Probability & Statistics – a calculus-based course for scientists and engineers) in Spring 2007, we resurrected it in Spring 2008 with a modest enrolment of 14 students.

Delivery: Starting in Fall 2008, all of our 3 credit mathematics and statistics courses will be offered in a new format: 3 lecture hours plus 1 student-optional 4th hour activity per week, instead of what we have been doing for many years (4 lecture hours per week). With the typical 13 week semester, this means that instead of 52 contact hours, students will have 39 contact hours. Content will remain unchanged; obviously, we have to adjust our delivery methods. Many of our additional examples will be downloaded to the '4th hour activity', whatever form this may take.

New Offering: In Fall 2008, we will be offering one 'special' section of Math 101, along with one regular section. The 'special' section will be based entirely on data and examples from sports and leisure activities. It will use different text materials, produced by Ken Towson and Reimar Hauschildt (see below), but will cover the same topics as the 'regular' section, and will have essentially the same final exam (similar questions; different data sets and applications). Because exactly the same technical topics

are covered, the course number will remain the same. In the timetable, the section will be identified by its 'special' content and emphasis. Students with an interest in sports will be encouraged to register in this section; other students without an expressed interest in sports are welcome in the section as well, with an assurance that they will 'learn the same stuff' as those in the other section. Ken & Reimar will be 'team-teaching' the sports section in Fall 2008 (and fighting over who will get to do it in future semesters!)

We're Baaack! After a one-year leave of absence, both Ken Towson and Reimar Hauschildt will be back teaching full time in Fall 2008. Ken and Reimar have spent the past year working on a text book, to be used for teaching an introduction to Statistics course (like our Math 101) for non-science majors, using entirely sports and other leisure activities as the source for data and examples. As of now, we have finished the first draft of the text materials, and are feverishly working to complete the problem sets. Obviously, nothing will be published this year, but we are planning to print a class set of our material for use in the Fall 2008 Math 101 course.

Langara College

The enrolment for the classes offered in the last year in Statistics were: 15 in Fall 2007 (one is a double section); 17 in Spring 2008, and 9 now in Summer 2008, a total of 41.
Software: Langara may be the only BC institute using Statgraphics. It is considered a very user-friendly package.

Selkirk College

This year will probably be the last year that Math 130 and 131 are offered on their current form. We are currently reviewing these courses, as they are not transferring in the best possible way for our students at this time. Math 130 currently fills as a College Math course for the Arts and Social sciences (and for ECE) as well as attempting to satisfy the requirements for our Business Administration programme. In the same way, Math 131 is both an introduction to probability and statistics for our business students, and a second College Math course for others.

We are looking at replacing Math 130 with a Math for Elementary Ed. and also with an introductory course in Mathematics for Business (Business Math I). In addition, Math 131 will most likely be absorbed into our existing Introductory Statistics course, Stat 105. It is anticipated that this will be beneficial to our Business students, and also remove duplication between Math 131 and Stat 105.

This Fall, we will offer our first edition of Stat 105 as an online course, but in light of the issues raised around online courses at BCCUPMS this May it should be pointed out that this will replace the current distance version of this course.

Thompson Rivers University

For the current academic year we had 17 full-time and 3 part-time faculty. Of these, only two have degrees in Statistics.
We lost our dear friend and colleague, Dr. Jim Totten, in March and we are all missing him greatly.
Dr. Don Noakes' term as Dean of our School will end in August and he will be joining us as a faculty member. Don has a strong statistics background and we are delighted to have him in our department. An interim dean will be selected from internal candidates.
Dave Tomkins (a statistician) received a Teaching Excellence Award from TRU.
Enrolment: Enrolment in our statistics service courses is falling. Enrolment in our upper level courses is up.
Program and Course Development: A joint major in Mathematics and Economics for the BA or BSc has been developed. It is not yet approved but it will be going ahead. A statistics stream is a suggested pathway for this degree and a course in regression is required for all students.
The addition of Dr. Noakes to our department means that we will be able to offer a minor in statistics and hope to be able to add a major in the near future.

Thompson Rivers University – Open Learning Division

Our only Statistics course, Stat 102, Intro Statistics has been revised to DeVeaux and Vellman, Intro Stats, 2nd edition. This course continues to be well-enrolled and is one of our top ten courses. No statistical software is used but the TI-83 graphing calculator is mandatory.

University of British Columbia

This year saw a bumper number of students graduate on Statistics programs at UBC, with a total of 37 graduating. Exact figures appear to be unavailable for previous years, but the 07/08 number is probably a record for our department and certainly in excess of totals from recent cohorts.

In January 2008 we had a departmental review, a process that occurs at approximately five-yearly cycles for departments at UBC. The visiting team reported favourably on our undergraduate program and our moves to enhance our teaching and learning methods. Discussions by the team with current undergraduates indicated an apparent dissatisfaction with the number of upper-level electives offered. To remedy this, next year we will run STAT 335 (Statistics in Quality Assurance) and STAT 442 (Statistical Methods for Categorical Data), both of which appear in the UBC calendar but have not been offered for several years. There are tentative plans afoot to revise our curriculum substantially, which may lead to additional courses being created, though whether this goes ahead will be determined by the priorities of the new head of department. At the time of writing the present head, Prof Will Welch, is nearing the end of his term and there has been no firm decision regarding his replacement.

This year saw the first offering of a new course, STAT 100 (Statistical Thinking). This course is not pre-requisite for any subsequent courses, and is also available to students who have taken upper-level STAT courses. The enrolment was capped at 45, and the course quickly filled this target, although ultimately only 37 completed. The course was deemed a qualified success by the five faculty members involved, and the enrolment cap will be lifted to 60 for the next academic year. Students transferring to UBC should be made aware of STAT 100 as an interesting elective. There is a tentative plan to offer the course in the Summer session in 2009.

As part of the Carl Wieman Science Education Initiative (CWSEI), our department received funds to "transform" STAT 200, our largest introductory course in terms of student numbers. Approximately 800 students take this course each year, nearly all from the Science faculty, and in 2007/08 we offered six sections. The transformation involved the development of detailed learning outcomes for the course, the creation and implementation of a pre- and post-course attitudinal survey, interviews with students who have taken both the transformed and pre-transformed versions of the course, substantially revising the lab activities and the adoption of PRS (personalised response systems, or "clickers") in the lectures. The impact of these measures has yet to be properly gauged, although initial impressions are positive. Hopes are high that further funding will be made available from CWSEI to facilitate transformations for most of our UG courses, and perhaps also to enable us to devise effective methodology for educational research. Further details on the transformation of STAT 200 can be found under item 7 below.

Traditionally our courses approximately 48 fifty-minute contact "hours", typically three hours per week plus a lab/tutorial/seminar session.

Further details on any of the above can be obtained by either visiting www.stat.ubc.ca or contacting Dr. Bruce Dunham at b.dunham@stat.ubc.ca.

University of Victoria

This report is actually for the last two years. The most significant change over the last two years is that we have added two new statisticians to our department. Drs. Laura Cowen and Farouk Nathoo joined us in 2006. Our statisrics group now has 6 people. This has strengthed our group considerably. Dr. Cowen specializes in capture-recapture methods and Dr. Nathoo specializes in Baysian and spatial statistics. They both obtained their PhD from Simon Fraser University.

With a 50% increase in our group, we are now able to offer a much wider selection of courses for our students. For undergraduate students, we have added two new 300 level and four 400 level courses to our lineup of statistics courses. These new courses have filled the vacume in the much needed upper level applied statistics courses for biosciences, health information sciences and medical school students. We have also added four more courses to our graduate program offerings, some of these are crossed listed with 400 level undergraduate courses due to our effort to maintain a minimum size of all classes.

We have previously used only Minitab for lower level statistics courses. But recently, some of our colleagues have started to experiment with teching Splus/R to students in 200 level courses. Knowledge in both Minitab and Splus/R will certainly benefit the students a great deal. We don’t have a policy on what software to use at the moment. It’s up to individual instructors to decide. This may creat a bit a problem for students taking a seqence of two courses if the follow-up course uses a different software than the first course in the sequence. But evidence so far suggests this is not a big
problem.

Vancouver Community College

- *Calculus I (Math 1100), Calculus II (Math 1200)* and *Introduction to Statistics (Math 1111)* are offered every semester by the Mathematics Department. The number of sections that will be offered next fiscal year will be reduced due to a decrease in enrolment.

- During the summer term (May-June), *Calculus I, II* and Statistics are offered 2 hours/day, 4 days/week.

- *Introduction to Statistics (Math 1111)* is a popular course, as it serves as a prerequisite course for the Dental Hygiene program, and will also be offered for the Bachelor of Nursing program commencing in 2009.

- Building expansion at the Broadway campus is well underway. The new building will be hosting Health Science programs.

5. Issues regarding articulation and transfer for Statistics courses, including any future changes to existing articulation agreements.

- As was noted last year, the articulation process at UBC has improved considerably and requests are being processed quite quickly. Institutions wishing to obtain informal feedback about an articulation with a STAT course at UBC are welcome to contact Bruce Dunham directly.
- Representatives were not present from SFU, UVIC, or UNBC.

6. Discussion of the distinguishing features of various types of "service" courses in introductory Statistics.

- This discussion resulted in a number of questions being raised, which included:
  - ① Smaller institutions cannot offer a variety of introductory Statistics courses, so how can/should the courses differ based on the student base? For example, how could, or should an introductory Statistics course for health sciences be different than one for general arts?
    It was suggested that instructors look at the curriculum the students will be studying later in their program and speak to the program directors to see which topics are most important for their particular students.
  - ○ Are there any recommendations for textbooks that serve particular fields?
    Freedman et al.'s *Statistics (4th ed.)* and Moore's *The Basic Practice of Statistics (4th ed.)* were mentioned, but not entirely supported. A suggestion to use case studies/abstracts was discussed as a good way to motivate students in a particular field.
  - ○ In a first Statistics course for engineers there appears to be more material than time. What is typically lost in order to make a course "calculus-based," and what is meant by this phrase?
    Experimental design and sampling tends to be down-played in these courses.
    While students may be able to perform sophisticated probability questions, they often lack a basic understanding of inference.

7. The transformation of UBC's STAT 200 course.

Carl Wieman joined the Faculty of Science at UBC in 2007 with the aim of bringing an evidence-based approach to Science education at the university. One course selected for "Wiemanization" was STAT 200, which approximately 800 (mostly Science) students within six sections take per year. Although in the past instructors and students were generally happy with the course and mean grades were quite high, there was a feeling that students were not walking away with a sound understanding of the much of the material. There follows some points of note regarding the developments:

- The transformation has no direct impact on existing articulation agreements and there is no change in the textbook adopted (Moore, McCabe and Craig's *Introduction to the Practice of Statistics 6th ed.)*.
- A six-page document entitled "STAT 200: Course Aims and Objectives" was created to give very specific learning outcomes to students as well as instructors. It is envisaged these learning goals will evolve over time, and feedback about these goals is welcome from the Statistics community within BC.
- Personal response systems, or "clickers", are purchased by students (approximately $50) prior to entering the course. This gives the students and the instructor instant feedback for questions asked during lecture. Questions posed are usually multiple-choice, and attempt to target important concepts and also identify possible misconceptions the students may have. A small percentage (3%) of the course grade is based on the responses. Lectures are typically

started with a question and have several more questions at key points throughout. This has greatly helped the instructors identify what students do not understand and has resulted in more time spent on the discussion of concepts within the lectures.

- Self-selected follow-up interviews were conducted with students four to six months after taking the course. A variety of questions were asked including some basic "explain in your own words what _____ means" type questions. The results were quite insightful if rather depressing; for instance, from ten students who had taken the "pre-Wiemanized" version of STAT 200, nine could not correctly define what the term "parameter" means in the context of the course. Many other topics were at least as badly understood, notably the concepts of sampling distribution and ANOVA. This has raised questions about whether a first-course in Statistics can realistically hope to communicate what are evidently very difficult concepts in statistical inference, as well as do a good job teaching exploratory data analysis and basic probability.
- The labs for the course had previously been in effect voluntary, since they carried no assessment weighting. This situation was changed in term 2 this year, with each of eight labs carrying 1% of the final grade. The students were randomly assigned to groups of three or four during the first lab, and would stay within these groups for the duration of the course. Each lab consisted of (i) a pre-reading document that was posted on the course web page in advance of the lab, (ii) a set of activities and problems for the groups to work through during the lab and (iii) a hand-in sheet for the group to complete to be graded by the TA. Since there are many lab sessions offered each week, multiple versions of each lab activity were created, all with the same pre-reading document. The aim was for the labs to focus on key concepts within the course, and to dovetail better with the lectures than had previously been the case. In some labs, ideas would be presented to the students informally during the sessions, to be met with more formality later during the lectures. This appears to be a successful approach to teaching the subject, using the notion of "knowledge evolution" from education research literature.
- Attitudes towards the discipline and also study habits were measured via an on-line survey. Students were requested to complete the same questionnaire both at the start and the end of the course, for a modest amount of credit. The survey asks students to rate their level of agreement on a five-point Likert scale to about fifty statements relating to the subject of Statistics. At the time of writing no definitive analysis has been undertaken on these data sets. Only a small set of about fifty students completed the survey having taken the "pre-Wiemanized" version of STAT 200.

8. Election of Statistics chair for 87th meeting

Bruce Dunham was nominated by Colin Lawrence and seconded by Al Fukushima to continue in the chair position for another term. The members jubilantly carried the motion unanimously.

9. Any other business

- The Statistical Society of Canada will be holding its annual meeting in 2009 at UBC from May 31st to June 3rd.
- There is possibly funding available through BCCAT for a Transfer Innovations (TI) & Transfer & Articulation (TAP) Project for the creation of a course "grid" indicating equivalences of Statistics courses across educational institutions across BC.
- Moore et al.'s *Introduction to the Practice of Statistics (6th ed.)* will soon have an online portal with a fully customizable eBook, etc. for approximately $50. This should be available for trial in June and be ready for the 08/09 academic year.
- Anyone who would like to join the Statistics e-mail distribution list should send a message to salloumg at camosun.bc.ca.

10. Motion to adjourn

Bevan Ferreira moved to adjourn. **Carried unanimously.**