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

## MINUTES OF THE 88th MEETING, MAY 18 – 19th, 2010

### *TUESDAY, MAY 18, 2010*

1. **WELCOME**
   Richard Lockhart, Chair of the Statistics and Actuarial Sciences Department, welcomed the BCcupms to its 88th meeting at Simon Fraser University.

2. **ADOPTION OF THE AGENDA FOR THE 88th MEETING OF THE BCcupms**
   The Agenda for the 88th Meeting was approved by consensus after deletion of items 1.3 The Meaning of Grades, 5.3 Experiential Teaching, and 5.4 Outreach, and the addition of Funding for and Attendance at Articulation Meetings under New Business for Wednesday's session.

3. **ADOPTION OF THE MINUTES OF THE 87th MEETING, HELD AT THOMPSON RIVERS UNIVERSITY**

   **Motion:** (moved by Al Fukishima and seconded by Clint Lee)

   **That the Minutes of the 87th Meeting be approved.**

   **Carried unanimously.**

4. **ANNOUNCEMENTS**
   **4.1. Introduction of representatives**

   **4.2. Attendance Lists:** Nora Franzova circulated the attendance lists.

   **4.3. Announcements from the host, Malgorzata Dubiel:** Malgorzata informed committee members that the publishers' displays would be in Room WMC 2531 throughout the meeting.

   **4.4. Notice of Election:** At this meeting elections for Chair of the BCcupms and for Chair of the Statistics Subcommittee were held. These positions have two-year terms. David Feldman, Nora Franzova, and Susan Milner volunteered to form the nominating committee.

   **4.5. Conferences:** Members were reminded about the Sharing the Math Conference, the Changing the Culture Conference, and the Canadian Mathematics Education Study Group Meeting, all being held at SFU on the days following the mathematics articulation meeting. Bruce Dunham announced the Joint Statistical Meeting which will be held in downtown Vancouver, July 31 – August 5, 2010. John Grant McLoughlin announced the Canadian Mathematical Society Summer Meeting, which will be held June 4 – 6 at the University of New Brunswick in Fredricton. The CMS Winter Meeting will be at UBC, December 4 – 6. The BC Association of Mathematics Teachers Fall Conference will be held at Delta Secondary, October 22, 2010.

   **4.6. Webpage Updates (Ian Affleck):** Ian, the webmaster for the BCcupms website, described changes that had been made to the site to update the look and make information easier to find. He asked members to keep him updated about upcoming events and conferences, as well as changes to members' contact information. He also encouraged all members to send in photos for the "Member Page" as soon as possible.

## Mathematics and Statistics Subcommittee Sessions (held concurrently)

**MATHEMATICS SESSION**

**Math1. Assessment Tests**—Susan Oesterle

Susan opened the discussion by describing recent efforts at Douglas College to simplify their assessment process. While the institution has given up on the idea of having a single assessment tool to assess readiness for all program areas (both applied and academic), the exercise has resulted in a sequence of assessments that will help determine placement within mathematics studies from basic numeracy up to calculus. Difficulties integrating various software packages with the current student records system has caused some delays in implementing this testing suite in an on-line format. Susan asked whether other institutions were also considering developing or revising their assessments, especially in light of the new curriculum and any uncertainty about the skills of our future students.

Wayne Matthews (Camosun) noted that uncertainty about the skills of our students is not related to the new curriculum. Students have been able to take Principles of Math in non-traditional formats (e.g. distance education, summer school, night school), and their skill levels can be quite varied.

Justin Gray described SFU's Calculus Readiness assessment. This multiple-choice test is administered in-class to all first-semester Calculus students. Four different versions are created and used each semester. Distracters among the multiple choices for each question were developed using errors actually made by previous precalculus students. Justin showed several graphs that showed the effectiveness of the assessment at predicting success in Calculus, especially when combined with high school math grades. He also mentioned the "Q" placement test that prospective SFU students must take if their high school math grades are not quite high enough for direct admission to the university. Students must either demonstrate mathematics proficiency on the "Q" test, or pass FAN X99, before they can access the "quantitative" courses that are required for all SFU degrees. This test is done on-line on-campus in a supervised computer lab using Lon-CAPA. Students have access to a simple calculator on the computer, but no other electronic aids are permitted.

Wayne Nagata described UBC's calculus-readiness assessment, which was taken from SFU. This exam was put in place due to concerns over the lack of a required provincial exam for Principles of Math 12 and the observed variability of high school grades. Students who do not have an A in Principles of Math 12 take the exam at the end of August or beginning of September. Those who do not reach a high enough level are required to take Math 110 instead of Math 100. Math 110 is a 6-credit course, spread over two semesters, which covers a precalculus review along with the calculus. The effectiveness of this test is being tracked.

John Grant McLoughlin (UNB) observed that assessment testing has been a point of tension in eastern Canada as well, including the issue of whether or not students should be able to use calculators on these tests. In New Brunswick, the university brought a group of high school teachers together over several days to help develop a Calculus-Readiness assessment.

At Trinity Western University (Rick Sutcliffe), all incoming science students take a test and are given advice on which Mathematics course to enter. The advice is not binding, but has been shown to be a good predictor of success in Precalculus I, Precalculus II and Calculus.

Selkirk College has optional assessments available on-line for students to use for guidance. David Feldman reported that they had tried to run a one-week-long course (half-day, every day) before the start of the semester that covered a precalculus review for students who did poorly on the assessment. It was not well attended. BCIT (Laura Billing) runs a similar course, half-days, for two weeks. Although they have not tracked it formally, they have had a positive response from students.

There was some discussion about different software packages for running assessments including: WebAssign, Maple TA and Lon-CAPA. No one is currently using WebAssign for assessements. BCIT is using Maple TA to run an in-house assessment, but Laura Billing noted that question banks are available. Participants from SFU advocated Lon-CAPA, noting that it is free, the resources are sharable, and they have been very pleased with how well it works for them. Nicholas Buck (CNC) mentioned that the Mathematical Association of America provides assessment services.

This discussion led to a consideration of the possibility of developing a common assessment for Calculus Readiness.

**Motion:** (moved by David Feldman and seconded by Clint Lee)

**That a subcommittee of the BCcupms be struck to develop a common assessment for Calculus Readiness and report at our meeting next year.**

                                                                           **Carried unanimously.**

Volunteers for the committee included: David Feldman, Peggy Tilley, Clint Lee, Tim Topper, Susan Milner, Jim Bailey, Justin Gray, and Mike Nyenhuis. David agreed to coordinate the first meeting. Justin offered to code the test in Lon-CAPA. It was

generally agreed that it would be nice if high school teachers could be involved in the development of the test. The committee was asked to contact the BCAMT to see if teachers would be interested in participating, even if only in an advisory capacity.

**Action: David Feldman will contact subcommittee members in order to begin the process of developing the Calculus Readiness Test.**

**Action: The Assessment Test Subcommittee will contact the BCAMT to solicit teacher input on the development of the Calculus Readiness Test.**

**Action: Representatives on the BCcupms will send any assessment tests for placement into Calculus that they are willing to share to David Feldman (dfeldman@selkirk.ca ).**

**Math2. The Role of Colleges in Helping Students Transition from High School to University**—Wesley Snider

Wesley opened the discussion with the following commentary:

"Historically, the role of the college was, in part, to help the unqualified or unprepared student transition to university. In short, get them up to speed. For some students, this transitioning period lasted through the first year or two of an undergrad degree. Recently, universities have developed courses (e.g. SFU MATH 150, UBC MATH 110) with more remediation, or preparatory kinds of courses prior to precalculus (e.g. SFU FAN X99, UNBC proposed 3 1-credit courses in MATH 11 Algebra) presumably due to an increase in the number of students that are ill-prepared for the usual entry-level courses, students that traditionally may not have found themselves at university. This suggests that there is, at least, no longer a reliance on colleges to bring those students up to speed, which may be a shift in the way the role of the college has been understood.

This may be an important issue because the way we perceive the roles of our institutions: affect our strategic and education planning; may affect how we see our institutions interacting; may ultimately affect learner pathways.

This may be an irrelevant issue because in the last two decades, the educational landscape in the province has changed significantly from a collection of colleges and 3 research universities to colleges, university-colleges, and 4 research universities, to colleges, teaching intensive (special purpose) universities, and 5 research universities. My own institution, a confirmed community college, now offers 8 baccalaureate degrees. Perhaps these institutions have become more isolated from each other in that many of them are taking more students from start to finish.

Do we see our institutions as each playing a unique role in a student's education? Do our roles need to be redefined? Have we become more competitive? Do the answers to those questions affect articulation?"

Malgorzata Dubiel (SFU) observed that much remediation is done through ABE, and commented on the large amount of research that indicates that remedial programmes for Math and English are often unsuccessful. The problem-solving approach taken in SFU's FAN X99 course is a deliberate effort to avoid a remedial model. SFU has tracked success of students coming from colleges and found that students who take Math 100 (Precalculus) at college do reasonably well in Calculus. With respect to the changing role of universities, she noted that historically the university was dealing with high demand, and retention was not a concern. Now it is more difficult to attract new students and retention is a priority. The university is also accepting students with a wider variety of qualifications, which means that students need more support.

A number of institutions (including UBC, Camosun, and Trinity Western) indicated that they were now more concerned with retention of students, and that the environment is becoming more competitive. One positive effect of this is that universities have been putting more emphasis on teaching in the last few years. A possible negative effect is the lowering of standards. Richard DeMerchant reminded members about the population trends which predict a significant drop in the number of BC high school graduates between now and 2015. More "mature" students are expected to return to school.

Wesley commented that given increased competition, good partnerships can improve cooperation. We may need to articulate more closely than ever, to the students' advantage. Douglas College has formed a partnership with SFU that allows Arts and Science students to be concurrently enrolled at both institutions. Justin Gray (SFU) described an agreement in place between SFU and Fraser International College. This college occupies space on Burnaby Mountain and offers first-year courses to international students. Grades from these courses are not only transferable to SFU, the grades are included in the student's SFU GPA.

David Feldman (Selkirk) drew the committee's attention to the Transitions Project, a BCCAT initiative which gives details on how students travel through the post-secondary system. Information in this report may be relevant to this discussion.

**Action: Ian Affleck will post the link to the BCCAT Transitions Project on the BCcupms website.**

Discussions of the role of colleges in preparing students for further mathematics study led to the addition of the following item to the agenda:

**Math3. Anticipated Course Changes in Response to the WNCP Curriculum**—Susan Milner

Susan asked if institutions are planning to change their precalculus courses to respond to students who have taken the Foundations stream: What, if any, changes should be made?

Institutions are at various stages of redefining prerequisites for their courses. Most are adopting a "wait-and-see" attitude with respect to the students who will be graduating under the new curriculum. The challenge will be in finding a suitable pathway for students to go from Foundations 11 to Calculus. There was much discussion about how much algebra a student with Foundations 11 can be expected to have. Peggy Tilley (Camosun) commented that Alberta was making changes to the WNCP. Her understanding is that they are taking many of the key Principles of Math 11 topics and sprinkling them throughout Foundations 11 and Foundations 12. Finance topics have been cut in favour of more algebra. Richard DeMerchant noted that since Alberta will be using the same textbook as BC, actual differences between the Alberta and BC courses is unlikely. (See Richard's report in Item 7 below for a link to Alberta's changes). Greg Schlitt (UFV) reported hearing from teachers that due to money shortages some schools are operating without either one of the two new possible textbooks.

Tim Topper (Yukon) observed that the Foundations stream was a perfect fit for preparation for Business Administration. He asked whether ABE would be offering a Foundations course. Jean McLeod indicated that this was being discussed, but budgetary restraints are a concern. It is difficult to offer too many diverse streams in ABE, especially given their audience of returning students who will have taken Math under a variety of previous curricula.

Wayne Matthews (Camosun) showed the committee the amazing flowchart created by George Ballinger at Camosun that shows which mathematics courses students can take, given their previous math history, and shows the pathways they can follow to access their desired math courses. This chart is available at [www.camosun.ca/math](www.camosun.ca/math). He reported that UVIC will be accepting Foundations 12 for general admission. He doubts that Foundations 11 will be accepted, but at Camosun students with this course will be able to access Intermediate Algebra. They are considering creating a Foundations of Math 12 course, or considering Foundations of Math 11 plus a Finance course as equivalent to Foundations of Math 12.

At Douglas College (Wesley Snider), students with Foundations of Math 11 or 12 will have access to the Mathematics Assessment Test and will be able to access either DVST (ABE) courses or precalculus level courses in the Mathematics Department.

Justin Gray reported that SFU was still awaiting confirmation by Senate that either Foundations 11 or Precalculus 11 will be accepted for general admission to the university (though some individual programmes will still require Precalculus 12).

In response to Susan's original question about changing the content of precalculus courses given the new curriculum, Malgorzata Dubiel (SFU) challenged the idea that changes need to be made. Precalculus was originally designed to prepare students for Calculus and will still do so. Curriculum changes should be driven by the purpose of the course, which in this case has not changed. Under the last curriculum change there was no need to add Probability to Precalculus, just because the topic was now in the Grade 12 course. At the same time SFU will need to give some thought as to how to help students to make the transition from Foundations 11 or 12 to Calculus, as they are not interested in getting involved in doing remedial work.

    **STATISTICS SESSION (please see the complete Minutes of the Statistics Session on pages 26-30)**

**Stats1. Approval of Agenda**

**Stats2. Approval of Minutes of the Statistics Subcommittee Session at 87<sup>th</sup> Meeting**

**Stats3. Matters Arising from the Minutes**

**Stats4. Institutional Reports**

**Stats5. Election of the Statistics Chair**

**Stats6. Other Business**

**Stats7. Motion to Adjourn**

# Plenary Session

5.  **Web Tools Presentations from Publishers' Representatives**
    During this year's meeting, representatives from three publishing companies gave short presentations on the course management software that they offer with their textbooks. Jennifer Cawsey and Terri Ward, from Bedford, Freeman & Worth Publishing Group, demonstrated their MathPortal resource using the Math for Teachers text by Sowder, Sowder and Nickerson as an example. It includes an interactive ebook, self-quizzes, solutions manuals and an assignment centre for instructors to create and manage assignments. Bijhan Shariff, from Nelson Education demonstrated Enhanced WebAssign for the new 2011/2012 edition of Stewart. The representative from Pearson, Kari Matusiak, showed their customised assessment tool, MyMathTest, which is not text specific. Like MathXL it manages on-line homework and offers tutorials. The software can be accessed at [www.mymathtest.com](www.mymathtest.com). Members can contact Kari to obtain an account id and password.

6.  **Reports from Mathematics and Statistics Sessions**

    **Mathematics Session**
    Nora Franzova summarised the discussions of the Mathematics Session.

    **Statistics Subcommittee Session**
    Bruce Dunham summarised the discussions of the Statistics Session. Bruce was acclaimed as Chair of the Statistics Subcommittee for another two year term.

7.  **Report from the Ministry of Education—**Richard DeMerchant
    - Information on student numbers within K to 12 can be found on the ministry web site at: [http://www.bced.gov.bc.ca/reporting/](http://www.bced.gov.bc.ca/reporting/)
    - WNCP will be adopted by AB, BC, MB, NB, NU, NT, NF, SK and YT. Alberta has made some changes to Foundations compared to WNCP. These changes are outlined at: [http://education.alberta.ca/media/794767/compare_wncpab.pdf](http://education.alberta.ca/media/794767/compare_wncpab.pdf)
    - Teachers in BC are very keen to find out about post-secondary admission requirements. The ministry has been hesitant to make announcements about admission requirements until admissions committees and senates make final decisions.
    - Discussions with several post secondary institutions are still occurring through RUCBC.
    - A series of 5 Elluminate sessions have been held to orient teachers to the new 10-12 curriculum. These sessions will be posted at: [http://www.bced.gov.bc.ca/irp/program_delivery/math1012.htm](http://www.bced.gov.bc.ca/irp/program_delivery/math1012.htm)
    - Textbooks for Apprenticeship and Workplace Mathematics 10 and Foundations and Pre-calculus Mathematics 10 are now available from the publisher in both French and English.
    - Have there been attempts by post-secondary to examine the new high school courses to see if adjustments need to be made in post-secondary courses to align the K-12 and post-secondary curricula?
    - Literacy Foundation courses have been created for students to help them prepare to complete high school courses. These courses will be implemented starting in the 2010/2011 school year.
    - The Ministry has started development of Numeracy Performance Standards for Grades 1-12. These will include rich tasks teachers can use to gauge student performance against a provincial standard. The current standards are located at: [http://www.bced.gov.bc.ca/perf_stands/numeracy.htm](http://www.bced.gov.bc.ca/perf_stands/numeracy.htm)
    - Sample provincial exams for grade 10 have been posted at: [http://www.bced.gov.bc.ca/exams/](http://www.bced.gov.bc.ca/exams/)

    Discussion of reaction of the post-secondary institutions to the new curriculum was largely covered under Math3 (above). Members were reminded that Education Planner on the BCCAT website provides information on which Math courses are being accepted for entry into different programs. There was some discussion of the benefits to students in taking both the Precalculus and Foundations streams, and how to make this option more attractive. One suggestion was that students could be able to access Calculus with a lower grade if they have both Precalculus and Foundations 12. There was some concern about whether highschools will be able to offer both. If schools can only offer one of the two streams, which will it be? As well, if students need either Precalculus 11 or Foundations 12 for admission to university, it is quite likely that some will choose to do Precalculus so that they only need to do one year of math in highschool instead of two. This is a concern as it undermines the intention of creating the streams in the first place.

8. **Keynote Address:  Different Learning Styles and Approaches**—Peter Liljedahl (SFU)
   Peter entertained and educated with his talk on learning styles and developing habits of mind conducive to learning.  Links related to his talk, including the Power Point slides and a reference list are available on the BCcupms website and can be found under Our Meetings.

   The Tuesday Session of the BCcupms adjourned at 4:35 p.m.

_____

# BCcupms and Secondary School Teachers Session

1. **Introductions and Opening Remarks**

   We welcomed Michael Finnigan, from Yale Secondary, James Ahn, from Fraser Heights Secondary, Blair Yochim, from Mediated Learning Academy, and Fred Harwood, from Hugh McRoberts Secondary to our Secondary School Teachers Session.

2. **Reports**

   **2.1  BCAMT** – Dave Van Bergyk
   Dave related that the most pressing concern is the issue of post-secondary acceptance of the new WNCP curriculum. Although Education Planner provides some information, it is not in an ideal format for use by highschool counsellors.  A chart format showing what math courses are needed for admission to different programmes, broken down by institution, would be more helpful.  Dave asked representatives on the committee to send him a summary of the decisions being made (or a link to an appropriate website) as soon as possible.  He would like to prepare a newsletter that summarises this information. Students will need to make decisions in the coming year about which of the three math streams to take in Grade 11.  His email address is davevanb@telus.net.  Information should be cc'd to Ian Affleck (ian.affleck@ufv.ca) as well, so that it can be posted on the BCcupms website.

   Dave also reminded the committee that implementation of the new curriculum involves more than a simple realignment of topics.  The new K-12 curriculum promotes 7 mathematics processes:  Communication, Connections, Mental Mathematics, Estimation, Problem Solving, Reasoning, Technology, and Visualisation.  These are embedded in every curriculum outcome, pushing teachers to think about the curriculum in a deeper and richer way.  This presents both an opportunity and a challenge. Teachers need more than just examples.  They need to find ways to engage students in problem solving, while teaching such things as radical equations.  They are being challenged to enrich their practice, and in particular they are looking for support in developing appropriate assessment practices.  A subcommittee on enriching assessment practices has been formed that will report out this Fall.

   There was some discussion regarding the dangers of having the Foundations course perceived as inferior, and reiteration of concerns expressed earlier in the day that students may choose Precalculus 11 in order to avoid having to take a second year of mathematics.  Some noted that the fact that Foundations has been accepted for university admission is an improvement over the status of the Applications of Math stream.  Dave commented that some schools will not be able to offer both streams, but not as many as one might think.  In response to a query from Fred Harwood (Hugh McRoberts Secondary) about whether universities would be implementing assessment tests, Malgorzata Dubiel (SFU) briefly summarised the earlier discussion (see Math1 above).  David Leeming (PIMS) noted that it will be crucial for parents to be educated about the mathematics pathways available.

   Dave also reported that the Grade 10 provincial final exams have been set, and that the Grade 12 exam is being developed, though it is still not clear what will happen with the Grade 12 exams.  The "optional" status of the exam does not make sense. Wayne Matthews (Camosun) related that there is now a non-calculator section on the Math 10 exam, and some questions have been introduced related to visualisation.  There was some discussion of the difficulties involved in testing some of the other "processes" listed above, in particular mental estimation.  Michael Finnigan (Yale Secondary) pointed out that the use of manipulatives (e.g. algebra tiles) will be difficult to test; the onus will be on teachers to make sure that those outcomes are completed.  There was some concern that the new test will be entirely multiple choice.  Malgorzata Dubiel countered that SFU has found that a lot of thinking can be tested with multiple choice if distracters are chosen carefully.  Other concerns raised

included:  the maturity level of grade 10 students, and the inability for students to get partial credit for questions that are marked simply as "right" or "wrong".

**Action:  Representatives will send Dave and Ian a summary of decisions that have been made regarding acceptance of the new WNCP mathematics courses for entry to programmes at their respective institutions.**

**Action:  Ian Affleck will post this information on the BCcupms website.**

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

3. **General Discussion**

   **3.1  What is being planned in response to the changes in curriculum**
   See 2.1 BCAMT report above.


4. **Adjourn to Reception.**   The session adjourned at 5:32 p.m.

*WEDNESDAY, MAY 19, 2010*

# Plenary Session

## 1. OPENING REMARKS

### 1.1 Introduction of representatives

### 1.2 Attendance lists
Nora circulated the attendance lists.

### 1.3 Announcements from the host:
Justin Gray announced that lunch would be provided by SFU, and provided information on the location of the Greek dinner.

### 1.4 Sign-up sheets for exams

The current process for exam sharing was discussed. Currently representatives bring sign-up sheets to the articulation meeting and send exams out to those who request them. Jim Bailey asked whether we would like to continue with this practice, or if there were other suggestions regarding how to handle this? Members of the committee affirmed the value of exam exchanges. Discussion surrounded alternative electronic means for sharing the exams, including: making them available to the general public on an institutional website (as UBC does), file-sharing, or emailing requests to representatives of particular institutions on an as-needed basis. Confidentiality is a concern for some institutions. In the end, Leo Neufeld agreed to investigate this further.

**Action: Leo will send an email to find out who has links to exams, and will explore options for using the BCcupms website as a nexus for exam exchange**.

## 2. CORRESPONDENCE
There was no correspondence.

## 3. REPORTS

### 3.1. BCCAT— Jennifer Orum

Jennifer Orum, the Special Projects Coordinator for BCCAT provided her report. Highlights included:
- Staffing changes: Frank Gelin and Finola Finlay are retiring. Rob Fleming, formerly a VP at Kwantlen, will be replacing Frank.
- Resources to support articulation are available on the BCCAT website including: the "Best Practice Guide: A Resource for Receiving Institutions", the "How to Articulate Handbook", the "Articulation Committee Companion", "Principles and Guidelines for Transfer", and the "Transfer-friendly Course Outline Form".
- A summary of the course articulation process, also known as TCES (the Transfer Credit Evaluation System): Departments send course outlines to the ICP (institutional contact person) and request transfer to selected institutions. These requests go into an automated system. An ICP at the other end receives the request and sends it on to the appropriate department where the decision will be made. Some of the work of ICPs is delegated to TCCs (transfer credit contacts). Sometimes clarification is required and contact between articulation committee members facilitates this. Use of the "transfer-friendly course outline" or an outline that provides similar information also cuts down on the amount of follow-up required.
- The TCES is now linked to the BC Transfer Guide, so once the sender is notified that transfer credit has been approved, the BC Transfer Guide is automatically updated (every 24 hours).
- In response to an increasing backlog in unanswered requests, the TCES has been programmed to automatically remove requests that are over 1 year old. Both sending and receiving institutions are notified that this is about to happen. Requests can be reactivated by the sender. Lists of pending requests are issued each year, in time for the annual articulation meetings. (The Mathematics list is posted on the BCcupms website.)

- Lists of pending articulation requests and names of ICPs at all institutions were distributed, with the ICP list available on the BCCAT website at http://www.bccat.ca/icp/members.cfm.
- Representatives were reminded to check the accuracy of their program information on the Education Planner website www.educationplanner.ca and if changes are needed, talk to the Education Planner contact at their institution. See http://educationplanner.ca/about.cfm?page=24 for a list of these contacts.
- The BCcupms could consider inviting the ICP at the host institution to give a presentation on how the articulation process works and to answer questions.

General discussion followed regarding a number of broader transfer issues.

Wesley Snider (Douglas) mentioned that the mathematics transfer information for IB programmes as listed on the BCCAT site seems to be inconsistent. The course names on the BCCAT site do not match the names of the courses on the IB website. He has been in contact with Mike Winsemann who is looking into this, but recommended that institutions check their own entries to make sure they are accurate.

A question was asked about how transfer requests for mathematics courses are handled when the request originates from a department other than mathematics. It was not clear how this would be handled, but it was suggested that it would make sense for the ICP of the sending institution to check with the mathematics department before sending the course outline on for evaluation. Jennifer also suggested that an issue like this could be discussed directly with the institution's ICP, or brought up either at the annual meeting of ICPs or at the JAM (Joint Articulation Meeting), which brings together Chairs of all articulation committees as well as ICPs.

There was also discussion of the possible need to recalibrate the current transfer system which dates back to the 60's. Students are no longer moving from a single college to a single university—they are moving all over. Many institutions who have traditionally been sending institutions are also receiving students. Institutions can apply to have their status as "sender" or "receiver" changed. BCIT was the first of the institutions previously designated as a "sender" to also become designated a "receiver". Okanagan College has now also applied to have both designations. Jennifer observed that it would be technically easy to designate all institutions as both senders and receivers, but there are workload and other implications for the institutions. It was noted that transfer arrangements are not necessarily symmetric, and also likely not transitive. However it was countered that traditional "sending" institutions are already considering transfer requests, but have to deal with them on an individual basis, which also takes time. Institutions who are interested in becoming receiving institutions should consult "The Best Practice Guide: A Resource for Receiving Institutions" and consider its implications.

There was much discussion about what the BCcupms could do to facilitate moving towards a transfer system that is more appropriate for the current needs of students, culminating in the following motion:

**Motion:** (moved by Al Fukishima and seconded by Bruce Dunham)

**Whereas, students no longer transfer solely from college to university, we resolve:**

**That the BCcupms supports the removal of the traditional designations of "Sending Institution"/"Receiving Institution", and would urge BCCAT and post-secondary institutions to make changes to reflect the current transfer needs of students.**

**Carried unanimously.**

**Action: The Chair of the BCcupms will send letters to BCCAT and the institutional Vice Presidents Academic to inform them of our support for these changes to the BCCAT system.**

Another concern that arose is the issue of handling interprovincial transfer of courses. Currently Alberta institutions can apply to be part of the BC Transfer System, but they must demonstrate that they already have a large population of BC students. Athabasca University was the first to be accepted. Since the funding in Alberta is different, BCCAT cannot put the same pressure on out-of-province institutions to send representatives to articulation, however, given that the committee structure is the foundation of our provincial articulation system, it was agreed that representatives from Athabasca should be invited to the next meeting. The Alberta Council on Admissions and Transfer (ACAT) has a parallel policy. Institutions may wish to consider whether they want to apply to join it as well.

**Action: The Chairs of the BCcupms and the Statistics Subcommittee of BCcupms will contact Athabasca University to invite Mathematics and Statistics representatives to our 2011 meeting.**

**Action: Leo Neufeld will ensure that Jennifer Orum is added to our BCcupms listserve.**

3.2. **PIMS**—David Leeming, PIMS Education Associates Coordinator

**PIMS Education Associates**
Two new PIMS Education Associates have 'signed on' since the last BCcupms meeting. They are Douglas College, New Westminster/Coquitlam, and Mount Royal College, Calgary. Currently, there are four institutions in Alberta and seven in BC that have taken advantage of the opportunity to be part of the PIMS Education Associates Program. On April 29 and 30, 2010, I attended the tenth North-South Meeting in Edmonton and spoke to representatives of the four Alberta institutions. They were very interested in what activities their sister institutions in BC were engaged in.

**Pi in the Sky**
The latest issue of Pi in the Sky is Issue #13 which was distributed in Fall 2009. David Leeming has resigned after five years as Managing Editor and the new Managing Editor of Pi in the Sky is Anthony Quas, also from the University of Victoria. The next issue should appear in the Fall of 2010. The magazine wants to publish articles that are readable by mathematically talented high school and College level students. The Editors would welcome submissions, including book reviews, from anyone in the BCcupms.

**PIMS First Nations Mathematics Outreach**
For several years now, PIMS has been engaged in math outreach to several First Nations communities, always by invitation. This initiative is primarily due to Melania Alvarez, PIMS BC Education Coordinator. Melania organized a (five day) workshop on First Nations Math Education which was held at the Banff International Research Station in November 2009. This brought together first nations teachers, tribal elders and chiefs as well as math educators and mathematicians. The objectives of the workshop were ambitious, however significant progress was made. There is a plan to meet again in two years.

Other initiatives undertaken, primarily by Melania, include working with teachers and students in Lytton, North Kamloops, Port Alberni, Campbell River, and Bella Bella.

We have also taken Math Mania to the Brentwood Tribal School (Leuwanel) at Brentwood Bay, near Victoria and there are plans to visit other First Nations schools on southern Vancouver Island.

3.3. **ABE**—Jean McLeod

Adult Basic Education Mathematics Committee Annual Articulation Meeting;
Vancouver Community College, November 12-13, 2009
prepared by Costa Karavas (VCC)

**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

1. **Ministry (AVED) Update - Shelley Gilmour**

Ministry of Advanced Education and Labour Market Development (ALMD)
Learning Programs Branch, Essential Skills, Developmental Programs and Adult Literacy Unit

**Regional Literacy Coordinators**
In 2008/09, ALMD created full-time RLC positions at 16 public post-secondary institutions. Due to the economic downturn, the $1.6 million funding for the RLCs was withdrawn earlier this year in order to focus on existing programs that provide direct literacy instruction and support. Many RLCs are college or university faculty and some will be assigned to other duties. A few institutions have indicated they will continue to support an RLC position with existing funding received under the block.

**Developmental Programs (ABE, ESL, ASE): Research and Student Surveys**

The pilot 2009 Developmental Student Outcomes Survey, which includes ABE/ESL students is nearing completion. The purpose of the survey is to ask former upper level ABE and ESL students to evaluate their educational experiences and to report on their transitions to the labour market and further education.

**2.   New Math streams (10 - 12)**

It is possible that small school districts will not be able to afford to offer all 3 streams (if only 2 are offered, it would likely be A&W and Precalculus, not Foundations). Bachelor of Nursing programs looking at requiring Foundations 12 as prerequisite. If so, we may need to adjust to meet student need. Would Pre-calculus 11 be equivalent to Foundations 12?

Discussion on how institutions will be setting their own prerequisites.

**3.   Proposal for Request for Funding (BC College Presidents)**

The funding will allow us to research implications of new WNCP math pathways and curricula on student transitions to and within post secondary institutions, and how these changes affect current ABE learning outcomes and course content.

The primary goal of the study is to compare outcomes and course content of ABE math courses with the outcomes and content of the WNCP math courses. These will be introduced at the grade 10 level by the Ministry of Education in September 2010. After comparing ABE courses with Ministry of Education (MEd) math courses and studying prerequisite skills required by post-secondary institutions, we will make recommendations to the ABE Working Committee regarding possible changes to ABE math course outcomes and content. The purpose of the recommended changes would be:

- to ensure that students completing ABE courses will continue to qualify for the Ministry of Education Adult Graduation Certificate,
- to ensure that students completing ABE courses will have equal opportunity to be accepted into post-secondary programs, and
- to ensure that students entering post-secondary programs with math prerequisites from ABE will continue to be well prepared for their further studies.

**3.4.  Math Challengers**—Leo Neufeld

Math Challengers (see page 13 of the Minutes of the 87th BCcupms Meeting) has completed another successful competition season despite additional scheduling challenges created by the 2010 Winter Olympics.  Overall, this year there were 21 schools sending Grade 8 teams and 20 that sent Grade 9 teams. This represents approximately 450 students that competed at the Regional level.

This year the Lower Mainland Regionals were held at SFU and the Vancouver Island Regional at Camosun College. Top students then advanced to a Provincial Competition, which was held at BCIT this year.  Just over 100 each of Grade 8 and Grade 9 students competed at the Provincials.  Besides trophies and medals for top competitors, there were also cash prizes for the top 3 students in each grade.  The various stages of Math Challengers are punctuated by refreshment breaks and by short talks on interesting math topics.  It's a really fun day for all!

All this is possible because of dedicated volunteers and committed teacher coaches, as well as financial assistance from organizations like PIMS, BCAMT, BC Hydro, IBM and APEGBC.  UBC, SFU, BCIT and Camosun College provide generous competition site-hosting support.  The kids love the events and everyone senses accomplishment when the day is done.  Our wish is to have even more participation particularly from across the Province.

For information about MC: http://www.apeg.bc.ca/mathchallengers/index.html
For previous competition problems: http://www.math.ubc.ca/~adler/challengers/

**4. BUSINESS ARISING FROM THE MINUTES OF THE 87th MEETING**

**4.1  Mathematics for Elementary Education:  Report of the Subcommittee**—Malgorzata Dubiel and Susan Milner
Susan Milner announced that the final draft of the report of the subcommittee is now available and distributed copies. She noted that the committee is still happy to incorporate any changes or suggestions.  She summarised the sections of the

document which include: the mandate and process of the committee, a set of guiding principles for those who teach the Math for Elementary Teachers course, a list of suggested content (which is secondary to the guiding principles), and appendices that provide sample activities, textbook reviews, and interesting weblinks. The report is the product of a great deal of consultation and collaboration. It is meant to provide guidance for institutions who plan to create or revise their course. Comments or questions should be sent to Susan Milner or Susan Oesterle. The BCcupms expressed its thanks to the members who served on this subcommittee for their efforts.

**4.2  College-to-College Transfer for Calculus I and II—**Jim Bailey

Jim showed the committee the website for College-to-College Calculus Transfer which has been created on the BCCAT website as a result of our discussions last year. To find the page, begin at the BC Transfer Guide page (http://bctransferguide.ca/), select Other Transfer Guides, then Program Specific Transfer Guides, then Mathematics/Statistics. Jim suggested that institutions may want to put a direct link to this page on their home websites, since it is a little difficult to find, and let their academic advisors and Registrars know that it is there. He clarified that checking the accuracy of this page is now a regular part of our annual meeting.

There was some discussion about the possibility of harmonising course numbers. Although this would make transfer more transparent for students it is difficult to implement this without infringing on institutional autonomy and policies. It was generally agreed that this was not a priority at this time.

David Feldman (Selkirk) posed a query related to the Core Curriculum for the Mathematics Flexible Pre-Major. He commented that his institution is unable to offer Real Analysis and is unlikely to be able to do so in the near future. He asked whether the requirements could be adapted to allow students to take Ordinary Differential Equations as an option instead of Real Analysis. This would allow a greater number of institutions to offer a full Flexible Pre-Major programme. A number of institutions indicated that this change would be helpful to them. Gary MacGillivray commented that at UVic they would expect students coming into third year to have ODEs but not Real Analysis. At Trinity Western (Rick Sutcliffe), Real Analysis is being changed to a 3rd year course that incorporates some Topology, and receives 4 credits. Other receiving institutions (UNBC, UFV, SFU) indicated that they did not foresee any problems with the suggested change. Bevan Ferreira (Selkirk) expressed concern that, at some institutions, taking Real Analysis late could affect the students' eligibility to register in certain higher level mathematics courses, or affect their status. At UBC (Wayne Nagata), mathematics students cannot move from 3rd to 4th year status without Real Analysis.  However, it was also noted that students can and often do receive exposure to more formal proofs in courses other than Real Analysis. All things considered, there was general agreement that the change suggested by David was in the spirit of the "flexible" pre-major.

**Action:  David Leeming and Leo Neufeld (original members of the Mathematics Flexible Pre-Major Subcommittee) will make the suggested changes to the programme requirements, get approval from receiving institutions, and bring the revision back to the meeting next year for ratification.**

**5.   NEW BUSINESS**

**5.1  On-line Courses**—Tim Topper

Tim reported that at Yukon College there is a big push to move all Computing Science and IT courses to an on-line format. It is expected that Math courses will also be offered in this format soon. Tim asked whether other institutions were also doing on-line courses, and asked them to comment on their experience and the platform that they are using.

Mona Izumi (Northwest Community College) has been teaching the Math for Elementary Teachers course on-line successfully for the last 10 years and more recently her institution has started to offer the NCIT Finite Math course this way as well.

Jason Diemer (North Island College) reported that they offer Math for Elementary Teachers in an on-line format. Formerly, Brief Calculus and Finite Math were also offered online using MyMathLab. This worked quite well for them, but they found that the tutorial support within it was not very good at higher levels.

At UFV (Susan Milner) and at Selkirk (David Feldman) a first-year statistics course is offered on-line. This was attempted at Douglas College (Wesley Snider) for a cohort of psychiatric nursing students, however given how difficult it was for the students, and given that most of them would have been able to attend the course face-to-face, it was decided to discontinue the on-line version.

At Okanagan College (Clint Lee) a precalculus course is offered twice per year in a guided (not self-paced) format using Blackboard.

At NVIT (Al Fukishima) a Business Math course is offered on-line, however they also notice that students have poor success and could, in fact, do the course face-to-face. They use Moodle.

Justin Gray reported that SFU now offers the Mathematics for Elementary Teachers using Lon-CAPA. They are quite happy with how it is going. Students complete both computer- and TA-graded assignments. They also offer Calc I with Review on-line using WebCT and Lon-CAPA. The Statistics Department at SFU (Richard Lockhart) runs two introductory statistics courses and one calculus-based statistics course. Anyone interested can contact Tim Swartz for further details about these courses.

Thompson Rivers University (Shane Rollins) offers a large number of on-line courses using Blackboard and Elluminate.

### 5.2  Mathematics and Statistics Courses Offered in Different Departments

This item was addressed during the discussion of Jennifer Orum's report from BCCAT. (See 3.1 above.)

### 5.3  Funding for and Attendance at Articulation Meetings

Concern was expressed over the number of institutions missing at this year's articulation meeting: UBC (Okanagan), Vancouver Island University and Northern Lights College did not send representatives this year. It was reported that Northern Lights did not send representatives to other articulation meetings as well, due to cancellation of the travel budget across their institution. It is a Ministry expectation that all institutions will participate in the articulation process, so funding should be available. It was acknowledged that travel funding can be an issue for smaller, more remote, institutions. Jean Macleod (ABE/VCC) mentioned that the ABE articulation committee uses a travel pool which results in each institution paying the same amount each year.

**Action:  Jim Bailey will send letters to the absentee institutions (UBC-Okanagan, Vancouver Island University, and Northern Lights College) reminding them of the importance of their participation in the BCcupms. A slightly different letter will be sent to NLC in consideration of their financial difficulties.**

**Action:  Jean Macleod will investigate the logistics of the travel pool used by the ABE articulation committee and will report on this at next year's BCcupms meeting.**

### 5.4  Elections

Jim Bailey was acclaimed as Chair of the BCcupms for another 2-year term. Bruce Dunham was acclaimed as Chair of the Statistics Subcommittee for another 2-year term.


## 6.  INSTITUTIONAL REPORTS

**ALEXANDER –** Len Berggren
Alexander College, located in Metrotown, has been growing. We're now at about 650 students and are renting additional space downtown, very near to SFU's Harbour Centre site. Despite my remarks last year, we still do not have a full-time faculty member in Math. However, we have had about 450 students enrolled in the 22 sections of the precalculus, calculus, and linear algebra courses that our sessionals have taught over the past year. We have raised our required grade in Math 12 for entrance to calculus from "Pass" to "C", but what I've learned at the BCcupms meetings is that we may well want to raise this requirement by a full grade-point.

**BCIT** – Laura Billing
- Applications have increased to our technology programs (which is the area in which the math department teaches most of its courses), but since we have fixed intakes for most of our programs, this would only correspond to a slight increase in enrolment.
- No changes to courses that affect transfer agreements
- New department head as of June 1st: Andrew McConnell
- New Dean of Computing and Academic Studies: Carly Seddon

### CAMOSUN – Wayne Matthews

#### Personnel

We now have 4 instructors close to, or above 65 years old. Two of them have opted for post-retirement positions. A few others are about 5 years back. Two have opted for part-time positions. So succession planning is a huge challenge. The difficulty as always is to maintain the level of rigour necessary for the high standards of the College, as well as to have instructors who are willing and able to reach out to involve and inspire the students.

#### New High School Mathematics Curriculum

The new pathways for Math 10 are starting September 2010. Our department developed templates and flowcharts showing which math courses from HS would appropriately feed our courses. We then made recommendations to other schools suggesting which math courses they might use as pre-requisites for their programs. The Technology departments and Health and Human Services largely followed our recommendations whereas Trades, Sports and Business relaxed their entry level in our opinion. The difficulty is the dichotomy created by the rhetoric of the ministry mandated curriculum and the reality of the experience of that curriculum in the schools. Parents and teachers will continue to encourage students into the choice most likely to involve post-secondary education, the Pre-calculus stream. The department flowchart can be viewed at http://ballinger.disted.camosun.bc.ca/MathCourseFlowChart.pdf and the program requirements at http://camosun.ca/learn/programs/math/requirements.pdf

#### Enrolment & Retention

At the MATH 072 (Intermediate Algebra) level we have developed a coordinated effort with the Learning Skills faculty which has successfully combined numeracy with overall study skills.

Enrolment has increased in Access (Math 11 level) and 1<sup>st</sup> year courses to the point of overflowing classes. This has translated into a slight increase in 2<sup>nd</sup> year.

Our Algebra course, MATH 230 had critically low numbers this year and is likely a casualty. Due to the strong transfer status of MATH 216 and the loss of transfer status of the business stats course in the college, enrolment has picked up as expected. This statistics course has a Math 12 pre-requisite, and is needed by Environment Technology and increasingly by Business students.

### CAPILANO – Ken Towson

- Enrolments have been stable, at about 90% of capacity averaged over all Mathematics and Statistics courses.
- Reimar Hauschildt retired last June after 30 plus years at Capilano. We currently have one Math faculty member on workload reduction so Reimar will not be replaced. We should shortly be announcing our new University President.
- Chris Morgan returned as Math and Stats coordinator from a one-year Paid Educational Leave in which he produced Maple-based online resource materials for Calculus 3.

### COLLEGE OF THE ROCKIES – Jim Bailey

Our Physics instructor, Richard Hewko, retired a year ago and since then I have taken on his teaching load on top of my own. On the Mathematics side, numbers are about the same as last year. Enrolment in our second year courses, particular Calculus 3-4 and ODEs, is low but there is no talk of cancelling them since I teach them as directed studies (no workload implications.) We have been negotiating with Selkirk College around co-offering our second year Mathematics, Physics, Chemistry, and Biology courses. One of the colleges will give the lectures via teleconference and each will supply tutorial support for their own students. For courses with labs we have talked about bussing students on two or three weekends so the entire class can have a shared experience. There are still many details to be worked out. The intention is to consolidate under-enrolled courses so they become viable and we can avoid having courses cancelled. It is hoped that eventually the workload which has been freed can be used to introduce new courses. Okanagan College has expressed an interest in joining us.

### COLUMBIA – Sam Ekambaram

Our student population is entirely international. The success rate of students taking Precalculus has been declining alarmingly. In order to minimize the failure rate of our Precalculus students, we are implementing the following:

1. Starting from last semester, we have increased the contact hours per week from four to five hours.

2. We are also providing mandatory Precalculus Tutorials in multiple sections for one hour per week. Each tutorial section has about ten students.

3.  We have been offering our home made Math Placement Test to identify the weaker students before taking Precalculus or Calculus courses. These weaker students are assigned a lower level algebra course before proceeding to Precalculus course.

4.  We have introduced a non-credit one semester algebra course, "Math 098" at a basic and intermediate level in order to prepare the weaker students to take Precalculus course. The enrolment is record high and we have opened three sections of this new course.

As usual we offer at least one second year course every semester. The number of students taking first year "Discrete Mathematics" course is diminishing as only very few students are interested in science subjects.

## COQUITLAM – Gera Belchev
No course changes to report.

## DOUGLAS – Wesley Snider
We have a few courses in various stages of development:
MATH 1183 (Mathematics for Animal Health Technology) will be run for the first time this fall.  MATH 2245 (Introduction to Mathematical Analysis) and MATH 2260 (Introduction to Probability and Statistics) are headed to Education Council for approval.

We have been asked to pilot a section of Mathematics for Non-science for a class of ESL students who are not quite finished their programme.  As they would not have the proper English prerequisites, the ESL department would offer a support section focussed on listening and writing skills.  The feeling is that with this support, the students can successful get their degree programme started while completing their ESL programme.  Similar course suites have been successfully run in conjunction with the Business Faculty.

The degree partnership with SFU that commenced this winter term for Humanities and Social Science students will be expanded to Science and Technology this coming academic year.

We are moving closer to be able to offer a post-degree diploma in the teaching of mathematics and science.

We now have a new Dean, VP Education, and President.

## FRASER VALLEY – Susan Milner (for Greg Schlitt)
Enrolments up approximately 10% in first year, over last year.
Major changes are (likely) coming in our statistics program above first year (subject to approval):
- We have a "standard" calculus-based introduction to statistics and probability course in second year, **Math 270**. Relatively few (approximately 20 students a year) take this course for reasons below.
- We also have "introduction to statistics" courses in first year (non-calculus based) which enrol relatively many students, at least 500 a year.
- We observe that most students come to university not having a clue about what statistics is, or that it could be a subject one could major in or have a career in. Thus an introduction to statistics at the second year level does not serve them well; it's run across merely as one among other requirements for a degree in a busy year.
- Yet our upper-level statistics program depends largely on this course **Math 270**, so it is presently serving as a choke-point.  But many "applied statistics" courses at the upper-level do not *necessarily* need the full calculus-based statistics and probability.
- We propose removing Math 270 from our curriculum. Replace with a course **Math 2XX**:
    o  Have a first-year statistics prerequisite, but not a calculus prerequisite, thus will have a large pool of potential students.
    o  Consists of a kind of window into upper-levels, some data analysis, some linear regression, some experimental design, some survival time analysis, and some time series. (Subsequent upper level courses pick up these topics in much greater depth).
    o  Our hope is thus that we will enable many more students to access applied statistics courses and perhaps attach a minor in the subject to their major concentration. (Our entire pool of 500 first-year statistics students would be potentially eligible to take this new course **Math 2XX**, and potentially move on to upper level applied statistics)
    o  There would remain a proper calculus-based probability course at the third year level, with a Calculus 3 prerequisite.

**KWANTLEN** –  Michael Nyenhuis

The only new course being developed this year is a course in problem solving. Our Differential Equations has a prerequisite of linear algebra, which may change to a corequisite. Our Calculus for Life Sciences courses and our Statistics for Life Sciences course need revamping, so their outlines may change.

Enrolments in math seem to have levelled off, but the second year courses are still in trouble.

The science departments have been given an ultimatum of developing a new B.Sc. by January 2011. This involves a surprisingly large amount of work. We are developing a degree in biology, and a handful of degrees in math (B.Sc. and B.A. major in mathematics, B.Sc. minor in mathematics, B.Sc. extended minor in mathematics).

The B.A. minor in mathematics is doing OK. We seem to have a handful of students in it, but only the registrar knows the actual number.

Our current dean is retiring in August, and we are to get an interim dean until it is determined whether there will be a faculty of science.

**LANGARA** – Nora Franzova

**Registration:**

Overall registration is up and that is also true in Math and Stats courses. We had to turn away a few students from our waitlists. Since Langara now has a BBA, the business math classes have increased.  Business Calculus is strong but unchanged by the BBA.   One (maybe two) new hires will be for the Fall. New Department Chair – Ken Collins, started on May 1st, 2010.

**New/ Old:**

Our upper level courses like Numerical Analysis and Calc IV did not fill, so they did not run this Spring. The Real Analysis course in the Fall had about 8 students. Our Math1173(1183)- Calc I with computer lab now merged with the regular Calc I (Math1171), only the students of Math1173 are required to  also take a lab component Math1183. The prerequisite to Math1173 is lower than the one to Math1171.
The college has a new Health Sciences program, where math is not directly a part of it, only one Stats course is included. After 1 year it seems fairly strong. Block transfer to SFU, seems to be unsuccessful for now.

**New Curriculum Approach:**

The Math and Stats department adjusted their admissions requirements to be prepared for the new generation of students that will be studying under the new WNCP course structure.

**Transfer Agreements:**

There have been no new transfer arrangements established this year. We are still hoping to get transfer of our Math1153/1253 (Intro to Calculus I (Part 1&2)) to transfer to Math110 at UBC.

**NEW CALEDONIA** – Nicolas Buck

1.  No course changes which would ramify on articulation agreements or enrolments.

2.  University Credit enrolment for the 2010-2011 academic year is down slightly at this stage.

3.  Conducted the provincial math contest once again.

**NICOLA VALLEY INSTITUTE OF TECHNOLOGY**—Al Fukushima

NVIT has no changes in their math course delivery.
o   Delivery of Math 040, 050, 051 ,060 at the College Readiness level
o   Business Math, BUSM 200 (Finite) and Intro Statistics (BUSM 207) , Stat 203 (Intro Stat for Social Sciences) currently offered
o   Math 100 (PreCalculus), Math 110 (Finite), and Math 120 (Intro Statistics) are not subscribed to.

NVIT is using *Accuplacer*  for entrance math diagnostics

NVIT has a satellite campus in Burnaby

New NVIT President – Ken Tourand

**NORTH ISLAND**—Jason Diemer

No changes to courses that affect transfer. Math enrolments were stronger this past year. The first offering of Math 133: Linear Algebra was successful. The new Chair of the Department of Mathematics and Science is Christine Hodgson.

**NORTHERN LIGHTS –** No representative was sent.

**NORTHWEST** – Mona Izumi

No changes in any of our Math courses. NCIT 202 Finite Mathematics was offered for the first time online in the fall semester. Articulation agreements are slowly trickling in. We continue to offer Calculus I and Calculus II and Intro Stats in both Terrace and Prince Rupert. Mathematics for Elementary Teachers was offered face to face in Terrace as well as online.

Enrolments were up in University Transfer in Terrace but down in both Prince Rupert and Smithers. We are still feeling the effects of the economic situation in our region.

**OKANAGAN** – Dave Murray

It was another relatively quiet year for the Department of Mathematics and Statistics at Okanagan College.

- No new programs or courses were introduced.
- Course enrolments were stable. In fact, total enrolment in OC math and stat courses has remained virtually constant since the birth of the "new" Okanagan College in 2005.
- There are no cuts planned to OC's math and stat programming for 2010-2011. No growth either.
- We continue to be primarily a service department, offering courses for the OC BBA program and for six two-year technology diploma programs.
- We continue to offer first-year university transfer at Kelowna, Vernon, Penticton and Salmon Arm and to offer selected second-year mathematics and statistics courses at Kelowna. Low enrolment in second-year courses continues to be a major concern.
- Shawn Desaulniers held a SNAP Math Fair ( http://www.mathfair.com/ ) in Penticton. The event was very successful and prompted Satoshi Tomoda to hold a similar event in Kelowna. In both cases, students from OC MATH 160 – Math for Elementary School Teachers – were involved.
- Each month from October to April, the department circulates a Math Problem of the Month to secondary and middle schools in the college region. Students may submit solutions to the department and may earn small cash prizes for correct solutions. Unfortunately, over the past couple of years, the response to the POTM has been somewhat underwhelming. The department is considering whether or not to continue with this initiative.
- One of our faculty members has decided to move from a full-time to a half-time continuing position. In accordance with the OCFA Collective Agreement, one of our term faculty will be regularized into the resulting half-time continuing position, so there will be no job posting.
- Our Dean (of Science, Technology and Health) resigned, effective April 30, after only nine months in the position. OC has begun the search for a new Dean.

**SELKIRK –** David Feldman

At the Department level:

Enrolments are up.

We are in the midst of a calculus retention project which may lead us to re-introduce our pre-calculus course (math 112).

We are engaged in discussions with College of the Rockies about joint delivery of some second-year courses.

Our new elementary-teacher prep and non-major courses ran successfully.

We will look at the possibility of offering a business stats course.

At the School level:

Our School Chair (heads all university transfer courses) has resigned.

We have approved associate degrees in Chemistry and Intro to Pharmacy.

At the College level:

We have a new Registrar: Cathy Mercer and a new HR director Gary Laier.

We are discussing establishing a "teaching and learning" centre.

We have had program suspensions in the Independent Film Program and our STEP program.

We have completed our review of prerequisites for the new High School math curriculum.

**SFU** – Justin Gray

1. Pre-requisite grades for changing calculus streams have been systematized. Advancing from the science-stream Calc-I (MATH 150/151) to Calc-II in either of the applied-streams (bio MATH 155, or socsci MATH 158) requires the minimum C-. Advancing from the applied-streams to the science-stream Calc-II or Calc-III (MATH 251) requires a minimum of B. The latter adjustment addresses some problems with "stream-jumping" – students taking advantage of lower entry grades to the applied Calc-I streams. Applied calc students also require B grades as pre-requisite for Linear Algebra (MATH 232/240) and Analysis I (MATH 242).

2. The second-year Math Modeling and Computation (MACM 202) 4-credit course has been split into two 2-credit courses – Computing with Linear Algebra (MACM 203) and Computing with Calculus (MACM 204). MACM 202 was a course specifically designed to introduce mathematical computing for Math majors – the scope of these new courses will be integrated with the content of the Linear Algebra and Multi-Variable Calculus syllabi. MACM 203/204 will be encouraged to be taken as co-requisites with their underlying subjects. The goal of MACM 203 will be to introduce applied and computational aspects of linear algebra – possible topics are large-scale matrix calculations, experiments with cellular automata, population models, data fitting and optimization, and image processing. The goal of MACM 204 will be to introduce applied and computational aspects of multi-variable calculus – possible topics are 3D visualization of curves and surfaces, disease spread models, multi-dimensional optimization and probability models.

3. For 2009/2010, we added themed special topics courses at the 3rd year level that target math minors in science and technology majors. This year's two offerings were well-populated with math-minors and other non-math majors.
• Mathematics of Sport and the Olympics (MATH 302, Prof. J. Stockie):
http://www.math.sfu.ca/courses/promo/math302-09.pdf
• Geometry and the Imagination (MATH 303, Prof. M. Devos):
http://www.math.sfu.ca/courses/promo/math303-10.pdf

4. In two of our Spring courses, Prof. J. Mulholland (MATH 150, ≈80 students) and Prof. M. Trummer (MATH 232, ≈180 students) ran an experiment attempting to change the "culture" of student assignments. Instead of collecting weekly problem sets, the same questions were assigned, and students were encouraged to compile their work into a "homework journal". Weekly quizzes set an effective due date for the assigned work. Students were required to bring their journals to the workshop office hours. The primary aim is to get students to see that the assigned work is for their learning benefit, not for getting some grade credit. Quiz scores were much more correlated with midterm and final exam results, hence students received direct feedback on their progress and efforts. Based on positive results from Spring term, several of our Summer offerings are continuing with this approach.

**SFU (Statistics) –** Richard Lockhart

1) Reviews of both undergraduate and graduate programs are underway. Graduate program revisions are nearly complete. Undergraduate revisions focussed on STAT major courses. The changes are constrained by the needs of: Computing Science, Engineering (who use STAT 270) and Actuarial Science who use many of STAT courses. An undergraduate Time Series course is likely to appear. One is aim to increase the clarity of computing requirements within courses and this may lead to a specific course.
2) A proposal for a five-year high-school to MSc program is under consideration.
3) Efforts to collaborate with Mechatronix / Engineering were unsuccessful.
4) Andrew Petter is the new president.
5) Enrolment is up 40% or more over 08/09, largely due to increased numbers in service courses.

**SPROTT-SHAW DEGREE COLLEGE –** Josiah Akinsanmi

**THOMPSON RIVERS –** Shane Rollans

**THOMPSON RIVERS (OPEN LEARNING) –** Veda Abu-Bakare (submitted by email)

The Mathematics and Statistics faculty of OL continue to make headway with the alignment of the face-to-face and OL Mathematics and Statistics courses with enthusiasm on both sides. This initiative has been spearheaded by Chris Morgan, now the liaison. The OL Math and Stat courses continue to do well (OL recently met the Ministry Enrolment targets). In particular, our MATH 191, Mathematics for Elementary Teachers, continues to be very successful.

**TRINITY WESTERN** – Rick Sutcliffe

**Introduction:** Trinity Western is a fully AUCC-accredited privately funded public Christian Liberal Arts University offering a variety of graduate and undergraduate programs in the arts, sciences, education, and professional studies. It has

operated in Fort Langley, British Columbia since 1962. There is no public funding, so the budget is driven by tuition and donations. Trinity Western University is the only Canadian university to get an A+ ranking for overall quality in the National Post survey each of the last four years.

**Faculty:** The Mathematics faculty consists of: Professor Rick Sutcliffe (chair), Professor Don Ariel, Associate Professor Richard Atkins, Assistant Professor Sean Ho, and Sessional Assistant Professor Samuel Selvin. Former chair John Byl has now retired.

**Enrolment:** Following many years of steady increases, and in accord with changing BC demographics, TWU saw enrolment declines after 2003 but this has apparently bottomed out at 2700, and we anticipate a growth in total numbers next year. These issues and bank restructuring requirements have created financial strains and resulted in faculty reductions, including three in Mathematical Sciences, which includes Mathematics, Computing Science, and Physics.
On the other hand, high Science and Nursing enrolment has greatly increased numbers in first year courses, even if not in majors.

**Programs:** The degree program in Mathematics with Computing Science is now in its twenty-eighth year, and has numerous successful graduates in a wide variety if Mathematical and IT fields. Our degree program in mathematics is in its thirteenth year and its grads have gone on to MSc and PhD programs, as well as into teaching and industry. The department now offers the first two years of engineering for transfer to UBC. However, due to the constraints mentioned above, intake into both the standalone computing science degree programs and the mathematics grad school prep program have been suspended until enrolment for majors recovers.

**Courses:**
1. We have combined the two Numerical Analysis courses (330 and 430) into one (330) and it will be a 4-credit course.
2. We have combined the two Differential Equations courses (321 and 322) into one (321) and it will be a 4-credit course.
3. Real Analysis (220) becomes 323, will include an introduction to topology and will be a 4 credit course.
4. Number theory will change number from 440 to 390.
5. Algebra will change number from 380 to 450.

These changes were approved by the TWU senate, though a number of computing science changes are still in the pipeline.

**UBC (Okanagan)** – No representative was sent.

**UBC (Education)**—Katharine Borgen

**UBC (Statistics)** – Bruce Dunham
A very busy year in the department saw three faculty positions being filled and work ongoing regarding the new building scheduled to accommodate Statistics from Summer 2012. The two assistant professor posts have been filled by Natalia Nolde and Alex Bouchard-Cote, the former a SFU graduate. The instructor position will be filled by Ms. Eugenia Yu.

Graduations from specialist degrees within the department were down in recent years, with 27 graduating since May 2009. The figure excludes those obtaining a minor in Statistics of which there were about a dozen as usual. Unusually this year there were no students graduating on any of our Honours programs.

Work commenced this year on a re-vamping of the undergraduate curriculum in Statistics at UBC. Aims include modernizing the content of our 3xx/4xx offerings and also facilitating non-specialist students taking our upper-level courses. Any changes resulting from this process are unlikely to affect the STAT 2xx courses currently offered.

The department is actively involved in the development of a new course to be piloted for the first time in the 2010/11 academic year. The course SCIE 300, Communicating Science, will form part of the new, revised General Science program. The pilot run will commence in January 2011. In addition to Statistics the development team includes faculty from Life Science, Chemistry and Journalism.

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

The UBC Vancouver Senate has passed that the minimum requirements for admission will be met by B.C. Foundations of Mathematics 12 or Pre-calculus 11. Faculty requirements will vary. Also many course requirements will be higher, including Calculus which will require Pre-calculus 12.

A new 3-credit undergraduate course MATH 305 was created this year. The title of the course is Applied Complex Analysis and is intended for third-year Engineering Physics students.

The total enrolment in 2009-2010 was over 15,000, up 11% from the previous year, and largest total ever. Of this, 46% is in first-year calculus course. For more recent news about the department, see:
http://www.math.ubc.ca/Dept/Newsletters/ubcmath_newsletter_2010.pdf
Past exams are online at http://www.math.ubc.ca/Ugrad/pastExams/index.shtml

**UNBC** – Lee Keener

- The Intermediate Algebra modules XMAT 161-1, 162-1, 163-1 were offered through Continuing Studies. They were not especially successful.
- We now have a Minor in Statistics.
- MATH 226 (Advanced Linear Algebra) has been renumbered as MATH 326.
- In February, the Mathematics Program was reviewed by an external team (Karl Dilcher from Dalhousie and Tony Lau from Alberta), the first review in many years. Over the summer and fall we will be analyzing their recommendations and determining those that we wish to implement. A substantial restructuring of courses and degree requirements is, however, extremely unlikely.
- There have been no significant administrative changes within the Program. But the current Dean of Science and Management is expected to step down this summer. The hiring of a new Dean is well advanced.
- The number of full-time mathematics and statistics faculty continues at six. This modest number compromises our ability to offer a broad range of courses; applied mathematics offerings have been particularly affected.

The number of mathematics majors is down from a few years ago, though still in the typical range for an institution of our size. Our first year calculus enrolments have increased however.

**UVIC** – Gary MacGillivray

Our new Department Chair is Chris Bose. He began a four year term on January 1, 2010. There are two curriculum changes of note. The first is the addition of tutorials to Math 101, Calculus II, beginning in September 2010. The second is the creation of Math 236, Introduction to Real Analysis (or something like that). It will be required in our major and honours programs in mathematics, plus some of the joint programs. The prerequisite is Math 122, Logic and Foundations, which is a first proofs course. UVic has always been a bit different in that it has a second year abstract algebra course, Math 212. That course remains required in our math major and honours programs.

**VCC** – Jean McLeod

There have been no changes to curriculum or course numbering that would affect articulation. Our enrolments continue to be strong, particularly in Introductory Statistics. The administrative void has been filled with a new President, VP Education and Registrar.

**VANCOUVER ISLAND UNIVERSITY (formerly Malaspina)** – No representative was sent.

**YUKON –** Tim Topper

## 7. COMMITTEE BUSINESS

### 7.1 Theme for our 89th Meeting

Some suggested topics for discussion at our next meeting included: Precalculus Courses (Malgorzata Dubiel), Aboriginal Perspectives in Mathematics Teaching (UBC-O), and Culturally Responsive Education (Veda Abu-Bakare, as suggested by Jim Bailey). A call will go out in advance of the next meeting for further suggestions.

### 7.2 Date and Location of the 89th Meeting

The 89th meeting will be hosted by Okanagan College in Vernon, May 17 - 19, 2011.

In 2012, the 90th meeting will be held at Vancouver Community College, subject to Dean approval.

**7.3  List Updates:  E-mail, Member Contacts & Listserves**

Members were asked to ensure that addresses on the circulated email list are correct and that names of representatives on the website are up-to-date.  Contact Ian Affleck for web information updates.  The names of any new department chairs should be sent to Ian as well.  Leo Neufeld can be contacted for changes to the listserve.  The Statistics listserve and the MFEE listserve are both maintained by Geoffrey Salloum.  Bruce Dunham will ensure the Statistics list is updated. Leo noted that when using the listserve the poster does not automatically receive a copy.  There was a temporary glitch that automatically sent responses to the entire listserve, but this has been restored and replies to sender will now go to the sender only.

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

**8.   Adjournment of the Wednesday session**

The Wednesday Session of the 88<sup>th</sup> meeting of the BCcupms adjourned at 4:26 p.m.

**Many, many thanks to Malgorzata Dubiel and the Mathematics and Statistics and Actuarial Sciences departments at Simon Fraser University for all their work in hosting us for this meeting.**

### List of Committee Members Present

**Plenary Session – Tuesday, May 18, 2010 (a.m./p.m.); Concurrent Math/Stats – Tuesday, May 18, 2010; Secondary Teachers Session – Tuesday, May 18, 2010; Plenary Session – Wednesday, May 19, 2010 (a.m./p.m.)**

| Name | Institution | TUES | MATH | STATS | TEACHER | WED |
|---|---|---|---|---|---|---|
| Veda Abu-Bakare (regrets) | Langara College/ Thompson Rivers University (Open Learning Division) | | | | | |
| Ian Affleck | University of the Fraser Valley | x | x | | x | |
| James Ahn | Fraser Heights Secondary | | | | x | |
| Josiah Akinsanmi | Sprott-Shaw Degree College | x | x | | | x |
| Melania Alvarez | Pacific Institute for the Mathematical Sciences | | | | x | |
| Jim Bailey | College of the Rockies (Chair) | x | x | | x | x |
| Gera Belchev | Coquitlam College | x | x | | x | x |
| Len Berggren | Alexander College | x | x | | | a.m. |
| Laura Billing | British Columbia Institute of Technology | x | x | | | x |
| Katharine Borgen | University of British Columbia (Education) | x | x | | x | x |
| Nicholas Buck | College of New Caledonia | x | x | | x | x |
| Winona Cordua-von Specht | British Columbia Institute of Technology | x | | x | | p.m. |
| Richard DeMerchant | BC Ministry of Education | x | x | | | |
| Jason Diemer | North Island College | x | x | | x | x |
| Malgorzata Dubiel | Simon Fraser University | x | x | | x | |
| Bruce Dunham | University of British Columbia—Statistics (Chair of Statistics Subcommittee) | x | | x | x | x |
| Sam Ekambaram | Columbia College | x | x | | | x |
| David Feldman | Selkirk College | x | x | | x | x |
| Bevan Ferreira | Selkirk College | x | | x | x | x |
| Michael Finnigan | Yale Secondary, Abbotsford | | | | x | |
| Nora Franzova | Langara College (Vice Chair) | x | x | | x | x |
| Al Fukushima | Nicola Valley Institute of Technology | x | | x | x | x |
| John Grant McLoughlin | University of New Brunswick | a.m. | x | | x | |
| Justin Gray | Simon Fraser University | x | | | x | x |
| Frank Harris | Capilano University | a.m. | x | | | |
| Fred Harwood | Hugh McRoberts Secondary | | | | x | |
| Mona Izumi | Northwest Community College | x | x | | x | x |
| Gabriela Kakushkin | Vancouver Community College | x | | x | x | x |
| Lee Keener | University of Northern British Columbia | x | x | | x | x |
| Natalia Kouzniak | Simon Fraser University (Surrey) | p.m. | x | | x | x |
| Clint Lee | Okanagan College (Vernon) | x | x | | x | x |
| David Leeming | Pacific Institute for the Mathematical Sciences | p.m. | | | x | a.m. |
| Richard Lockhart | Simon Fraser University (Statistics) | p.m. | | x | x | x |
| Colin Macleod | Kwantlen Polytechnic University | p.m. | | x | | |
| Jean MacLeod | Vancouver Community College | x | x | | x | x |
| Gary MacGillivray | University of Victoria | | | | | x |
| Wayne Matthews | Camosun College | x | x | | x | x |
| Petra Menz | Simon Fraser University | x | x | | | |
| Susan Milner | University of the Fraser Valley | x | x | | x | x |
| Dave Murray | Okanagan College | x | x | | x | x |
| Wayne Nagata | University of British Columbia (Vancouver) | x | x | | x | x |
| Leo Neufeld | Camosun College (Retired) | p.m. | | | x | x |
| Nadia Nosrati | Simon Fraser University | a.m. | x | | x | x |
| Michael Nyenhuis | Kwantlen Polytechnic University | x | x | | x | x |
| Susan Oesterle | Douglas College (Secretary) | x | x | | x | x |
| Randall Pyke | Simon Fraser University | a.m. | x | | | |
| Shane Rollans | Thompson Rivers University | x | x | | | x |
| Greg Schlitt | University of the Fraser Valley | x | x | | x | |
| Wesley Snider | Douglas College | x | x | | x | x |
| Rick Sutcliffe | Trinity Western University | x | x | | x | x |
| Peggy Tilley | Camosun College | x | x | | x | x |
| Tim Topper | Yukon College | x | x | | x | x |

**List of Committee Members Present (Continued)**

| Name | Institution | TUES | MATH | STATS | TEACHER | WED |
|---|---|---|---|---|---|---|
| Ken Towson | Capilano University | x | | x | x | x |
| David Van Bergeyk | BC Association of Mathematics Teachers and Salmon Arm Secondary | x | x | | x | |
| Tracy Wall | College of New Caledonia | p.m. | | x | x | x |
| Blair Yochim | Mediated Learning Academy | | | | x | |

*UBC (Okanagan), Vancouver Island University and Northern Lights College did not send representatives.

# BC Secondary School Mathematics Contest 2010
## Report to the BCcupms

On May 7, 2010 the Final Round of the BC Secondary School Mathematics Contest was written at 11 provincial colleges, university colleges, and universities.  Students who had performed well on an earlier preliminary round held within their own high schools were invited (together with a teacher sponsor) to attend the final round and spend a day at the local post-secondary institution with several activities involved.

This year the participating institutions were:

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

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 | 17 | 11 | 98, 96, 91 | 80, 72, 62 | 52 | 44 |
| Cap | 25 | 23 | 100, 91, 90 | 90, 85, 80 | 66 | 52 |
| CNC | 18 | 24 | 69, 62, 55 | 57, 51, 49 | 35 | 35 |
| Doug | 12 | 13 | 100, 94, 93 | 83, 79, 71 | 78 | 53 |
| Lang | 6 | 8 | 74, 70, 62 | 100, 99, 89 | 58 | 74 |
| NIC | 22 | 21 | 60, 55, 48 | 55, 54, 50 | 30 | 38 |
| NWCC | 5 | 10 | 67, 62, 36 | 49, 44, 39 | 42 | 28 |
| OC/UBCO | 42 | 27 | 59, 52, 51 | 70, 59, 57 | 33 | 31 |
| TRU | 31 | 36 | 60, 58, 55 | 59, 57, 47 | 30 | 29 |
| VIU | 31 | 35 | 66, 60, 58 | 77, 76, 64 | 32 | 36 |
| UCFV | 71 | 52 | 89, 90, 79 | 82, 76, 63 | 41 | 32 |
| TOTAL | 280 | 260 |  |  |  |  |

Approximately 1600 Juniors and 1100 Seniors throughout the province 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 necessarily an accurate reflection of the level of participation in the Preliminary Round.  A total of 540 students participated in the Final Round this year, up somewhat from last year.

The Preliminary Round is handled in essentially the same way at all institutions.  The Preliminary Round contest papers are mailed to participating schools.  The contest is administered and marked at the schools and the results, including the names of the Final Round participants, are transmitted to the hosting institution.  The Final Round does have variations.  At all institutions the Final Round contest was administered on the morning of May 7, 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 contests 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.

One significant change was made in the Final Round by at least one institution.   The Grade 8 contestants were given the option to do the long answer portion of the contest in teams of three.  At OC the Grade 8s were put into a separate room and after about an hour were given the option of staying in the room to work in teams or be moved into the room with the other Junior contestants to work on their own.  All but one Grade 8 opted to work in the team environment.  For these students the multiple choice answer

sheets were collected and the group was divided into teams of three, not from the same school.  Once they were divided into teams, they immediately started working together.  The consensus of the invigilators, contestants, and teachers was that this approach was very successful.  The contestants seemed to enjoy and benefit from the interaction.  All seemed to have felt that, overall, it was a positive experience.

Thanks should go to those who have organized the Contest at their individual institutions and encouraged their local  schools to participate in the Contest.   First there are the primary organizers at each of the Colleges: Wayne Matthews at Camosun College; Marsha Anderson at Capilano University; Nicholas Buck at College of New Caledonia;  Dan Henschell at Douglas College; Nora Franzova at Langara College;  Jason Diemer at North Island College; Mona Izumi at Northwest Community College; Clint Lee and Leslie Corbett at Okanagan University College and Wayne Broughton at UBC Okanagan; Sonja Hott at Thompson Rivers University; Ian Affleck at University of the Fraser Valley; and Patrick Ng at Vancouver Island University College. Although these are the primary organizers 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 always, 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.

Furthermore, the problem posers who either submitted problems or came together at Thompson Rivers University last May in Kamloops to put together the initial drafts of the contest papers are: Wayne Matthews and Chris Odgers (Cam), Jim Bailey (COTR), Nicholas Buck (CNC), Clint Lee and Satoshi Tomoda (OC), Nora Franzova (Lang), Mona Izumi (NWCC), Lisa Lajeunesse (Cap), Ian Affleck (UFV), and John Grant McLouglin (UNB).

In addition, those who proof-read the contest are: Clint Lee and Satoshi Tomoda (OC), John Grant McLoughlin (UNB), Susan Milner (UFV), Nora Franzova (Lang), Chris Odgers (Cam), Lisa Lajeunesse (Cap),  Ian Affleck (UFV), and Nicholas Buck (CNC).   The solutions were prepared and typeset by Jim Bailey (COTR), 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 is also 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 with information on winners from the individual institutions, will be posted on the BCSSMC web site at people.okanagan.bc.ca/2010/MathContestBCCUPMReport_2010.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 2010 contest are:

       Preliminary Round:        Wednesday, March 30, 2011

       Final Round:        Friday, May 6, 2011

Respectfully submitted to the BCcupms on May 19, 2010 by


Clint Lee

Okanagan College, Vernon

## MINUTES OF THE STATISTICS SUBCOMMITTEE
## 88TH BCcupms MEETING, MAY 18 – 19, 2010

### TUESDAY, MAY 18TH, 2010

**Present:** Bruce Dunham (UBC) Chair; Al Fukushima (NVIT); Shane Rollans (TRU); Colin Macleod (Kwantlen); Ken Towson (Capilano); Winona Cordua-von Specht (BCIT); Richard Lockhart (SFU); Bevan Ferreira (Selkirk); Gabrielle Kakushkin (VCC); Tracy Wall (CNC). Apologies for absence received from Susan Chen (Camosun) and Larry Weldon (SFU, retired).

**Chair:** Bruce Dunham

**Acting Secretary:** Richard Lockhart

### 1. Approval of Agenda

**Motion of approval of agenda:** Moved: Ken Towson; seconded Al Fukushima; approved. **Carried unanimously.**

### 2. Approval of minutes of the Statistics Subcommittee Session of the 87th meeting

**Motion of approval of minutes:** Moved: Al Fukushima ; second Bevan Ferreira; approved. **Carried unanimously.**

### 3. Matters arising from minutes

As an action item from the previous meeting the Chair had contact Finola Finlay from BCCAT to determine whether there was a formal procedure for the appeal of articulation decisions. It transpired BCCAT has no formal procedure for appeals. In the case in hand the Chair had given UBC-V STAT 200 credit for a BUS course that it subsequently appeared articulated better to UBC-V's STAT 203. The Chair had notified BCCAT and corrected this articulation decision. A discussion ensued regarding the formalization of procedures and of the need for flexibility in evaluation of transfer, particularly for institutions who must use one course to serve needs in many disciplines. Dual designations were suggested, perhaps something like STAT 101 for UT and BUS 101 for accounting students. It was also suggested that an academic from a sending institution ensures an articulation request for a Statistics courses nominates the best match at the receiving institution.

### 4. Institutional Reports

#### BCIT

There have been no big changes recently. BCIT Statistics courses are particularly program focused and so likely do not articulate well to university courses. There may be some new engineering-oriented courses soon.

#### Camosun College

Geoff Salloum has extended his leave of absence for another year. Eric Cormier from UBC will join this September. There are no other significant changes.

#### Capilano College

Business is as usual. Enrolments have been at about 90% of capacity in the past year. A new president is to be appointed very shortly.

#### College of New Caledonia

The college offers MATH 104 (Stat) and a Business Statistics course in business. Two sections are offered in Fall, one in January. The January section usually has a waiting list. Fall courses usually mostly full. Health Sciences students are sometimes choosing Business Stats as their Statistics course.

### Kwantlen

There have been lots of growing pains in moving to Polytechnic status. The institution is still looking for a dean and a vice president. A new president was appointed last year. There is much uncertainty regarding recent transitions. There has been a directive that the institution must offer a "true" BSc program within one year to avoid cuts. Possible majors include Biology and Mathematics. Some cancellations have been seen in low enrolment upper division classes, particularly in a course that articulates to SFU 270 though is probably at a higher level. There are moves to develop a third year Statistics course with limited prerequisites.

### Nicola Valley Institute of Technology

The current president is leaving and the former VP of Finance is taking over; concern was expressed about the future focus of the institute. A challenge remains covering many clients with one Statistics course because of resource constraints.

### Northwest Community College

NWCC offers Introductory Statistics at the Prince Rupert and Terrace campuses. In Prince Rupert both courses are for University Credit and Business Administration and are delivered by the Math department. In Terrace the two departments have separate offerings. There is much greater demand in Terrace due to the Nursing program.

### Selkirk College

Enrolments are up at Selkirk overall but there has been a softening of Science enrolments. Dissolved MATH 130/131: 130 is replaced by Math for elementary education and Bus. Math 131 was a finite math type introductory Statistics course that was not very transferable. Business Stat 1 is being investigated. The college is also looking at STAT 105 aimed at Arts and Social Science students. STAT 105 now transfers to Okanagan College as 121 and to 124, OC's Business Statistics 1. A collaboration with the College of the Rockies is being pursued, primarily to offer low enrollment courses jointly via video conferencing.

### Simon Fraser University

1) Reviews of both undergraduate and graduate programs are underway. Graduate program revisions are nearly complete. Undergraduate revisions focussed on STAT major courses. The changes are constrained by the needs of: Computing Science, Engineering (who use STAT 270) and Actuarial Science who use many of STAT courses. An undergraduate Time Series course is likely to appear. One is aim to increase the clarity of computing requirements within courses and this may lead to a specific course.
2) A proposal for a five-year high-school to MSc program is under consideration.
3) Efforts to collaborate with Mechatronix / Engineering were unsuccessful.
4) Andrew Petter is the new president.
5) Enrolment is up 40% or more over 08/09, largely due to increased numbers in service courses.

### Thompson Rivers University

The search is on for a new president after the firing of the last one who prompted major re-organization. Math/Stats is moving to Science as of 1 Sept. (to the School of Advanced Technology and Mathematics). A new chair is starting 1 June. One new multivariate course has appeared for MSc Environmental Science students. Enrolments have been good.

### University of British Columbia, Vancouver

A very busy year in the department saw three faculty positions being filled and work ongoing regarding the new building scheduled to accommodate Statistics from Summer 2012. The two assistant professor posts have been filled by Natalia Nolde and Alex Bouchard-Cote, the former a SFU graduate. The instructor position will be filled by Ms. Eugenia Yu.

Graduations from specialist degrees within the department were down on recent years, with 27 graduating since May 2009. The figure excludes those obtaining a minor in Statistics of which there were about a dozen as usual. Unusually this year there were no students graduating on any of our Honours programs.

Work commenced this year on a re-vamping of the undergraduate curriculum in Statistics at UBC. Aims include modernizing the

content of our 3xx/4xx offerings and also facilitating non-specialist students taking our upper-level courses. Any changes resulting from this process are unlikely to affect the STAT 2xx courses currently offered.

The department is actively involved in the development of a new course to be piloted for the first time in the 2010/11 academic year. The course SCIE 300, Communicating Science, will form part of the new, revised General Science program. A pilot run will commence in January 2011. In addition to Statistics the development team includes faculty from Life Science, Chemistry and Journalism.

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.

### Vancouver Community College

There were no changes to report.

### 5.    Province-wide license for Minitab.

Prompted by the suggestion of Veda Abu-Bakare (Langara College and Thompson Rivers University – Open Learning Division) the Chair had investigated the possibility of member institutions obtaining a BC-wide license for Minitab. It transpires this would cost around $47k for unlimited use by faculty and students in the province, this being more than the (approximately) $30k spent by institutions and on student rentals last year. The Chair had contacted HEITBC (Higher Education Information Technology in British Columbia), the not-for-profit organization that now deals with licensing deals for software. Although initially responsive, an executive director of HEITBC has failed to respond to several promptings from the Chair regarding how a license would be administered.

The major Minitab user in the province had been SFU, but that institution has recently opted to cut back its licenses for Minitab from 700 to 55, a move that likely makes a BC-wide deal unviable.

**Action: The Chair is to meet with a Minitab representative in July to discuss possible ways forward.**

### 6.    Flexible pre-major in Statistics (See Appendix A, page 30)

The Chair prepared a document akin to that for the flexible pre-major in Mathematics, and which simply shows the lower division requirements at UBC, SFU and UVic lined up beside each other.  The document does not suggest any sort of block transfer arrangement.  There are difficulties with the differing lower division requirements outside of Math and Statistics, such as lower-level Science faculty requirements at UBC. Additionally, the requirements for the Statistics major at UBC are likely to change in the next few years.  Comments on Bruce's document are encouraged.

**Action: The Chair is to contact the Statistics representative at UVic to ensure requirements are current. Also, Chair will contact Jennifer Orum (BCCAT) to investigate how any Statistics pre-major can be ratified.**

### 7.    "Province-wide" standards in introductory Statistics courses.

This topic was raised by Susan Chen (Camosun) *in absentia*. There was a brief discussion on the matter, partly focussed on somewhat mathematical Statistics courses that are offered at certain institutions in BC. The Chair voiced the opinion that other than where an introductory Statistics course is aimed at Engineering students (for whom the professional bodies require a calculus-based introduction to Probability and Statistics) introductory courses are better if focusing on statistical, rather than mathematical, ideas.

### 8.    Athabasca University contacts

This Alberta university has recently been admitted into the BCCAT system, and offers several Statistics courses.

**Action: The Chair is to contact Julie Peschke, Math/Stat faculty at Athabasca, welcoming her university to BCcupms.**

## 9.  Election of Statistics Chair for 89th meeting

Bruce Dunham was re-elected for another two-year term by unaminous vote.

## 10.  Any other business

- The subcommittee approved in principle the notion of removing the labels of "sending" and "receiving" traditionally attached to institutions in the BCCAT system. No problems were envisaged if current articulation agreements for Statistics courses were deemed symmetrical.
- The Chair mentioned that the Joint Statistical Meeting (JSM) is to be held at the Vancouver Convention Centre, 31st July to 5th August 2010. This is the largest meeting of statisticians worldwide.

## 11.  Motion to adjourn

Bevan Ferreira moved to adjourn. Seconded by Al Fukushima.  **Carried unanimously.**

## Appendix A:  Statistics Flexible Pre-Major Discussion Document

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

| Stat Major Requirements | UBC(V) | SFU | | UVic | Freq. |
|---|---|---|---|---|---|
| **1st Year** | | | | | |
| | | | | | |
| Calculus I | MATH 100 | MATH 151 | | MATH 100 | 3 |
| Calculus II | MATH 101 | MATH 152 | | MATH 101 | 3 |
| Comp Science | CPSC 111 | CMPT 120 | CMPT 126 | CSC 110 | 3 |
| Comp Science | | CMPT 125 | | | 1/0 |
| | | | | | |
| **2nd Year** | | | | | |
| | | | | | |
| Calculus III | MATH 200 | MATH 251 | | MATH 200 | 3 |
| Linear Alg | MATH 221 | MATH 232 | | MATH 233A | 3 |
| Intro Analysis | MATH 220 | | | MATH 201 | 2 |
| Statistics I | STAT 200 | STAT 270 | | STAT 260 | 3 |
| Statistics II | MATH/ STAT 302 | STAT 285 | | STAT 261 | 3 |
| Comp Science | CPSC 211 | | | | 1 |
| **Course Totals** | | | | | |
| Mathematics | 5 | 4 | | 5 | |
| Statistics | 2 | 2 | | 2 | |
| Comp Science | 2 | 2/1 | | 1 | |
| **Total** | **9** | **8/7** | | **8** | |