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

MINUTES OF THE 90th MEETING, MAY 15 – 16th, 2012

TUESDAY, MAY 15, 2012

1. WELCOME

Jean MacLeod, Chair of the Mathematics Department, welcomed the BCcupms to its 90th meeting at the King Edward Campus of Vancouver Community College.

2. ADOPTION OF THE AGENDA FOR THE 90th MEETING OF THE BCcupms

The Agenda for the 90th Meeting was approved by consensus after agreeing to add discussion of Calculus III and IV courses as item 4 to the agenda of the Mathematics Parallel session.

3. APPROVAL OF THE MINUTES OF THE 89th MEETING, HELD AT OKANAGAN COLLEGE (VERNON)

It was noted that the link to the Ministry of Education curriculum posters on page 5 was not working. (Susan will check into this.) There were no further comments on the minutes.

Motion: (moved by Wesley Snider and seconded by Richard Lockhart)

That the Minutes of the 89th 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 hosts: Gabriela Kakushkin provided information on internet access and logistics for the meeting.

4.4 Notice of Election: At this meeting elections for the Chairs of the BCcupms and the Statistics Subcommittee will be held. These positions have two-year terms. Susan Chen, Rick Brewster and Nora Franzova volunteered to form the nominating committee.

4.5 Conferences: Members of the committee shared information about upcoming conferences that might be of interest to the group. These included: Sharing Math on May 17 at VCC, Changing the Culture, May 18 at Harbour Centre in Vancouver, the annual meeting of the Canadian Mathematics Education Study Group, May 25 – 29 at Laval University in Quebec, the Canadian Undergraduate Mathematics Conference, July 11 – 15 at UBC(Okanagan), and the Northwest Mathematics Conference, October 18 – 20 in Victoria. Members were reminded to let Ian Affleck know about upcoming events so that he can keep the information up-to-date on the BCcupms website.

Mathematics and Statistics Subcommittee Sessions (held concurrently)

MATHEMATICS SESSION (Chaired by Jim Bailey)

Math1. Report from the Calculus Readiness Test Subcommittee—Justin Gray and David Feldman

Tim Topper reported since neither Justin nor David was able to attend the meeting this year. He reminded committee members that this subcommittee had been struck to create a calculus readiness test. Given that several institutions were interested, it seemed to make sense to pool resources and avoid duplication of effort. Members of the subcommittee include:

Tim Topper (Yukon), Justin Gray (SFU), Nora Franzova (Langara), Susan Milner (UFV), Mike Nyenhuis (Kwantlen Polytechnic University), David Feldman (Selkirk), Jennifer Hyndman (UNBC), Rick Sutcliffe (TWU), and representatives from Thompson Rivers University and UVic.

Over the last year the committee made use of the 1999 Mathematics Proficiencies Report to inform their construction of a pool of 90 questions, 3 from each of 30 identified proficiencies. These questions are currently in a free response format which will be piloted at SFU in the Fall semester. The students' responses to the questions will be used to build a multiple-choice version.

Nora Franzova reported that Langara has been looking into using MapleTA for their placement tests. By show of hands, 8 or 9 representatives indicated that they have a placement test at their institution already, while 7 or 8 institutions offer assessment tests.

Concern was expressed that the new curriculum may not cover some of the content that is on the test being developed. Tim clarified that the intention of the readiness test was not to retest high school and that the committee had not looked at how the topics they were testing fit into the curriculum. The Readiness Test being created is meant to test whether students have the necessary proficiencies to be successful in calculus. At the same time, it seems likely that the curriculum would cover the topics on the test as the test does not contain anything unusual. It was noted that post-secondary institutions may need to rethink what they do in Calculus based on what students are learning in high school now.

Chris Becker (BCAMT) commented that while some feel like the new curriculum is less intensive than the old, others believe that Precalculus 11 is more challenging than Principles of Math 11 because it is geared more towards kids who are going on to calculus, and as a result is more like an honours course. He added that it will be a while before the new curriculum is implemented thoroughly.

There was some discussion of how the potential test questions could be made available to the other members of the BCcupms without being visible to the public prematurely. It was decided not to post the questions on the website at this time. Members who are interested are encouraged to write to Tim for a PDF version of the questions. Feedback is welcomed.

Math2. UBC Changes to Calculus II—Wayne Nagata

Wayne reminded the committee of last year's announcement that UBC was re-introducing sequences and series into their Calculus II courses and would be revisiting transfer agreements. He provided an update, confirming that all streams of Calculus II now have about three weeks of sequences and series content. However, while the change in curriculum has taken place, UBC will abide by the Core Calculus Agreement and will not revoke transfer agreements with institutions that do not include these topics. On transferring to UBC, students who have not covered sequences and series will be warned that they will be at a disadvantage in some future mathematics courses (particularly complex analysis or partial differential equations) and will have an online module made available to them so that they can catch up. When asked, it appeared that all institutions already cover sequences and series in their Science stream, but no one indicated that this topic is included in Business Calculus. Discussion of whether sequences and series should be included in the core topics listed in the Core Calculus Agreement was deferred to later in the agenda, to be discussed during the plenary session.

Math3. Proof Courses: What are they? What should they be?—Mike Nyenhuis

Mike described his initial motivation for placing this item on the agenda: He observed that traditionally students had been exposed to formal proof for the first time in real analysis courses, but that now a number of the universities also offer (and sometimes require) "Introduction to Proof" courses. By raising this question he hoped to clarify what kinds of mathematics courses could be used to transfer to, for example, SFU or UBC versions of the Intro to Proofs course. Could a Real Analysis or Number Theory course satisfy program requirements for a proof course? After doing some research before the articulation meeting, Mike came to the conclusion that the only course that would be accepted as transferable to an Intro to Proof course would be another Intro to Proof course. In some instances, having a Number Theory course might be used to excuse a student from taking Intro to Proofs, but would not earn transfer credit; however, it was noted that these courses have been introduced because it was felt that students were not receiving sufficient background in proofs through the traditional courses, and because of this it is not unreasonable to not accept other traditional courses in lieu. Wayne Nagata commented that students who take Honours Calculus III or IV at UBC, or equivalent, are exempt from taking the Intro to Proofs course (which is required in their Mathematics program). UVic considers the cases of in-coming transfer students individually to determine what courses they will need to complete a mathematics degree.

Math4. Calculus III and IV courses—Wesley Snider

Wesley opened discussion of the overlap in content between Calculus III and Calculus IV. At Douglas College, Calculus III starts into vector calculus, covering space curves and line integrals. He asked what other institutions do in these courses, and

whether they go as far as Green's Theorem. Jim Bailey (CotR) commented that they have a combined Calculus III/IV course (industrial strength for engineers), but don't have much demand for Calculus IV. A show of hands showed that very few institutions offer Calculus IV regularly. Trinity Western (Rick Sutcliffe) has just recently made some changes to its curriculum, repositioning Complex Analysis in place of Calculus IV, as so much of the Calculus IV is already covered in Calculus III. UNBC (Jennifer Hyndman) has done something similar. At Kwantlen (Mike Nyenhuis) topics aren't repeated in Calculus IV, but no new content is added, making it a relatively easy course for students. Alan Majdanac (Douglas College) felt that duplication of topics between the two courses is at the expense of some really good topics which could be introduced. Wayne Broughton (UBC(O)) commented that more could be added to Calculus IV, but cautioned against packing more into Calculus III. Langara (Nora Franzova) goes as far as Green's Theorem. The difficulty in finding a good textbook for Calculus IV was brought up; many seem to be using Davis & Snider.

The question was raised as to whether there would be transfer issues for Calculus III courses that did not cover vectors. Malgorzata Dubiel reported that SFU is currently re-examining the curriculum for Calculus III and IV. They are hoping to make Calculus IV more meaningful, particularly for applied mathematicians. She noted that transfer credit could be an issue for SFU, as their expectation is that courses must match significantly in order to be eligible for transfer credit. Most institutions would not be concerned about transfer if only one topic is missing.

Math5. Difficulties Experienced by Math 12 Students Taking Calculus—Wayne Matthews

Since the Mathematics Parallel Session had completed its agenda early, and the Statistics Parallel Session required more time, it was decided to move this discussion up and invite Wayne to make his presentation earlier than planned.

Wayne described the work he has been doing, co-teaching Calculus 12 in a high school alongside a high school teacher. He observed that there are significant differences between secondary school versions of Calculus and those taught at post-secondary institutions. In particular, the post-secondary courses are developed by specialists, have evolved over time, and have a well-defined curriculum that is articulated across institutions, while the high school versions tend to be less consistent, and have been developed by individuals with varied mathematics backgrounds in a more ad hoc way. Schools also have to deal with selecting and purchasing textbooks for their students.

Wayne had prepared a list of some of the particular concepts that students who take calculus might either not have covered at all previously or are likely to still have difficulties with. The list is available http://www.bccupms.ca/Conference_Documents/Meeting_90_VCC/PreCalcWeaknesses.pdf . His intention with this presentation was not to criticise, but rather to raise awareness of some of the conceptual barriers to success that in-coming calculus students may have. Discussion followed, touching on a number of different threads as summarised below. Much of the discussion centred on concerns about the new curriculum.

- *The students' conceptual deficiencies*: The concepts listed did not come as a surprise. It was noted that it was common practice and unproductive to lay blame for deficiencies on earlier educational experiences. As educators we are all tasked with bringing students up from wherever they are. Students don't always remember concepts, even when they have been covered. Topics, once covered, are sometimes not discussed again, and current practice is for students to only be tested on recent coursework, not on material from previous courses. Despite best efforts, deficiencies will continue to exist, regardless of the curriculum, and these can vary from group to group and year to year.
- *The new curriculum*: It will take a few years before schools have fully adapted to the new curriculum and its new pedagogy. With the new approach, there is more emphasis on understanding versus merely grinding through calculations. The Ministry has not been providing teachers with much guidance on how to implement this curriculum and support student success. Students are often still being streamed according to ability, though the new streams are intended to be distinguished based on content and its applicability to different contexts. A consequence of this is that there is some concern that Foundations of Math, in particular, may be watered down to accommodate weaker students. While some schools have a relatively even split between numbers of students taking Precalculus 11 versus Foundations of Math 11, the Foundations stream continues to be a tough sell for parents who want to keep doors open for their children. There is concern that students who are inappropriately enrolled in Precalculus 11 may end up taking it twice, and hating it, which may prevent them from taking further mathematics later. The new Precalculus 12 course will be offered for the first time beginning this Fall.
- *The new textbooks*: Some schools have not bought the textbooks that go with the new curriculum because they cannot afford them; some buy the workbooks instead. Others complain that the new books are too wordy. This is particularly an issue with the Apprenticeship & Workplace 10 and 11 texts. These courses are often taken by very weak students. The text is true to the curriculum, but what can be done to support these students? Concern was expressed generally about current students' abilities to read word problems and it was hoped that the new curriculum

may help improve this. Publishers have been made aware of errors in the new textbooks, but are unwilling to publish errata or to re-publish.

- *Accountability*: A question was raised about what mechanisms are in place to hold teachers to the curriculum, now that there are no provincial exams. Chris Becker (BCAMT) replied that although there are none, generally teachers will be making their best efforts to follow the curriculum. It was suggested that more post-secondary institutions may be looking at introducing pre-tests, like the Calculus Readiness Test discussed above. Making these tests available would help teachers and students know what they need to know in order to be prepared, although there was some resistance expressed to creating an environment where teachers will "teach to the test".

- *High school grading*: The current push is for teachers to only assess students based on their understanding of the curriculum. This precludes grade penalties for late or incomplete work. It was noted that this creates a culture-shock for students when they move on to post-secondary studies as they have come to expect make-up exams and assignments, but these are no longer available. Another difference between high school and post-secondary is that in high school it is possible for students to fail a course, but still to advance. This could easily happen when a student fails grade 8 math in middle school and then proceeds to a high school where they will go on to take Math 9. Some schools may not promote students who fail, but technically there are no prerequisites for high school mathematics courses.

- *On-line courses*: The issue of concerns about students achieving inflated grades in on-line mathematics courses was raised. In some places, very few students register in on-line mathematics courses. Wynona Cordua-von Specht (BCIT) reported that, in her experience, many students in North Vancouver take high school mathematics on-line in order to get high grades. She is aware of students who are easily getting a 95% when they should be at the 80% level. She noted that the on-line course has no final exam. Chris Becker offered to discuss this with the BCAMT executive, but was unsure if anything can be done.

- *Precalculus courses in post-secondary*: Wayne Matthews commented that the College Precalculus courses are not a step up from the new Precalculus 12 course, and asked what we will do when students are reluctant to retake a course that they feel they have already done, once they go to a post-secondary institution. Others felt that the new Precalculus will be better than the old Principles of Math 12 as preparation for Calculus, but that it will still not be as strong as what is done in college Precalculus. Although the topics are similar, they are covered at a deeper level. Selkirk (Ross Bates) offers students a 15-hour refresher course before they start Calculus that seems to be effective. BCIT (Laura Billing) does the same in the last two weeks of August. Their course is classified as ABE and is tuition free, so it is limited to two sections and restricted to BCIT students. The tuition-free status of the course is problematic as often students who register don't show up. Anecdotal reports indicate that students find it to be very helpful.

- *What can be done*? High school teachers need to be aware of the deficiencies and make sure that students have opportunities to learn and get practice with these concepts. It was suggested that it should be ensured that these concepts are among the Precalculus learning outcomes. Post-secondary instructors also need to be aware of and adapt to the conceptual gaps in-coming students will have. There was discussion about how the information in Wayne's report could be made available to teachers and post-secondary instructors and how dialogue about this could be encouraged. It was suggested that the report be made available on the BCcupms website and that the link should be publicized on the BCcupms and BCAMT listserves. Interested members were also encouraged to consider submitting articles to Vector or to CMS Notes. It was reiterated that such articles should not come across as being critical of teachers. Of particular interest would be positive articles on how to constructively address students' conceptual difficulties. Institutions who host the Math Contest could take advantage of the opportunity to have open discussions with teachers to break down barriers, build connections, and address common challenges. Wayne Matthews described a previous successful PIMS-funded arrangement between UVic, Camosun, and local high schools that had allowed individual teachers/instructors to visit each others' classes, however teachers are no longer able to get release-time for this and so it no longer takes place. Chris Becker (BCAMT) offered to facilitate connecting interested post-secondary instructors with high school teachers for the purpose of exchange visits.

ACTION (Wayne Matthews, Ian Affleck, Jim Bailey, Chris Becker): Wayne's report will be made available on the BCcupms website and the link should be publicized on the BCcupms and BCAMT listserves.

ACTION (All members): Members are invited to write constructive articles on dealing with students' conceptual difficulties in Calculus and submit them to Vector or CMS Notes.

ACTION (All members): Members are encouraged to foster opportunities to meet with high school teachers to break down barriers, build connections and address common challenges, for example, through discussions at Math Contest events, or through arranging classroom visits.

STATISTICS SESSION (please see the complete Minutes of the Statistics Session on pages 27 - 31)

Stats1. Approval of Agenda

Stats2. Approval of Minutes of the Statistics Subcommittee Session at 89th Meeting

Stats3. Matters Arising from the Minutes

Stats4. Institutional Reports

Stats5. Novel Uses of Technology in Undergraduate Statistics Teaching—Susan Chen, Camosun College

Stats6. Election of Statistics Chair

Stats7. Other Business

Stats8. Motion to Adjourn

Plenary Session

5. 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.

6. Report from the Ministry of Education—No report this year.

Despite Jim Bailey's best efforts, no one from the Ministry attended the articulation meeting this year.

7. Difficulties Experienced by Math 12 Students Taking Calculus, continued

The earlier discussion was summarised for the plenary session. The additional comments arising at this time have already been incorporated into these minutes under Math5 above.

8. BUSINESS ARISING FROM THE MINUTES OF THE 89th MEETING

8.1. UBC Changes to Calculus II—The Core Calculus Agreement

The discussion from the Mathematics Parallel session was summarised and it was confirmed that all institutions currently include sequences and series in their Science stream Calculus II course.

Jim Bailey advised the committee that the Core Calculus Agreement was due for review as it was last revised in 2007 and needs to be reviewed every 5 years. There was discussion about whether a committee should be struck to do this, or whether it could be done as a committee as a whole. Given that it may be appropriate to move sequences and series into the list of core topics, and that such a change might have an effect on the percentage balance between core and optional topics, it was decided that a committee should be struck so that any changes and their implications could be considered more carefully. Volunteers included: Gary MacGillivray (UVic), Wayne Nagata (UBC), Lisa Lajeunesse (Capilano), Costa Karavas (VCC), Ladislav Stacho (SFU) [nominated by Malgorzata Dubiel], and Michael Nyenhuis (Kwantlen).

ACTION (Core Calculus Agreement Subcommittee): Members of the subcommittee are to review the Core Calculus Agreement and bring recommendations for any updates to the BCcupms meeting next May. Gary MacGillivray will coordinate the first meeting.

As part of this discussion it was observed that although the Core Calculus Agreement addresses Science Calculus and Calculus for Social Sciences, it does not mention Calculus for the Biological Sciences. Malgorzata Dubiel commented that SFU may change their Math 154/155 program significantly in the long term. There is pressure from Biology to offer a single course that will prepare their students instead of the current two. With respect to the Core Calculus Agreement there seemed to be less opposition to including Calculus for the Biological Sciences under the Social Sciences courses rather than under the Science Calculus courses, but there was concern that this may also not be appropriate. Further discussion of how to handle this was left to the subcommittee.

8.2. Proposed changes to Math for Elementary Teachers course at SFU and UFV: Revisiting transfer agreements—Malgorzata Dubiel

Malgorzata summarised the history of Math 190 at Simon Fraser University, dating back to 1985 when there were two 3-credit courses, Math 190/191, up to its revision into a single 4-credit course in 1990. She noted that some of the articulation agreements in place date back to the time before the courses were combined. The current version of the course is under review, motivated by on-going concerns about the mathematical preparation of elementary teachers, as well as emerging research on mathematics-for-teaching. At the same time, SFU is undergoing an accreditation exercise under which all programs and courses are preparing new sets of course outcomes. This will be done for the Math 190 course. Although the precise timeline for this is uncertain, transfer agreements will be revisited once the new outcomes are in place.

A second issue that Malgorzata raised involved the intent of the Report of the Math for Elementary Education Core Curriculum Subcommittee. She reminded members that the subcommittee had stopped short of producing a core curriculum in the spirit of the Core Calculus Curriculum. The report offers recommendations and advice for institutions who offer the Math for Elementary Teachers course, but it is not the case that if a course loosely satisfies the guidelines that it will guarantee transfer credit across institutions. For example, courses offered at UVic and SFU both satisfy the guidelines but the courses do not transfer to each other because of substantial differences in content. There was concern about having sufficient lead-time to respond to SFU's changes since they are not yet known. Malgorzata indicated that the changes will likely not be drastic; she expects the revision to include a fair amount of geometry as not enough is done in high school. She reassured members that there was no intent to throw out all current agreements.

There was some further discussion of the on-going frustrations involved in trying to prepare future elementary teachers with only one course. Jennifer Hyndman reported that UNBC had been working with the Chair of Education to try to have them require two mathematics courses for teacher accreditation. However, since none of the other institutions (except UVic) require two courses, there is fear that the additional requirement will make institutions that require two courses less competitive. If all institutions would require two, the problem might be overcome. Minimal requirements for accreditation are set by the Ministry of Education, but past attempts to lobby the Ministry to increase the mathematics requirements (including a motion passed at the BCcupms) have been ignored. It was noted that California has recently changed to require 4 mathematics courses, and now are facing challenges as instructors in mathematics courses are often unprepared to teach these courses. The WISE Math movement in the Prairies was mentioned as a group who is currently advocating for a greater role for mathematicians in the preparation of teachers.

Prerequisites for the course were also discussed. In 2006, SFU increased their prerequisite to a B or better in Math 11 (Principles, Precalculus or Foundations). Without this students must take FAN X99. This has worked well for them as the FAN course seems to help students deal with anxiety, learn to think mathematically, and sort out the basics before taking Math 190. Prerequisites at other institutions vary. A C in Math 11 is typical, but in some cases students are admitted as mature students with only grade 10 math taken many years ago.

8.3. Collaborative offering of under-enrolled Mathematics and Science courses (OC, NIC, & CotR)—Jim Bailey

At last year's meeting Jim reported on the successful collaborative offering of Ordinary Differential Equations and Calculus IV undertaken by College of the Rockies and Okanagan College. For this year, these institutions had planned to offer Linear Algebra collaboratively, but this fell through, as did plans for an Engineering Statics & Dynamics collaborative course offering between College of the Rockies and North Island College. The institutions involved will try again this year and hope to include Selkirk College, which has recently lost its second-year mathematics and science courses and is hoping to salvage its engineering transfer program.

Two weeks ago a Memorandum of Understanding was signed by 21 institutions in support the notion of collaborative offerings in principle. Six institutions have committed to start offering such courses within the next two years.

Jim asked if members of the committee had yet seen a recent discussion paper published by the Ministry of Advanced Education, entitled "British Columbia's Quality Assurance of Post-Secondary Education Framework" (available at http://www.aved.gov.bc.ca/education_quality_assurance/docs/pse_framework.pdf). This framework will be used as a basis for a Quality Assurance Act for BC institutions that will govern both public and private post-secondary institutions. The document outlines three major goals with sub-objectives, and raises questions including: "How can high quality standards be assured for the diversity of delivery modes (e.g., distance education) and collaborative arrangements (e.g., joint degrees)?" (p. 7), suggesting that the Ministry is considering the possibilities and implications of collaboration between institutions.

Jennifer Hyndman described a project underway at UNBC to build a database of open source linear algebra materials. She invited members to let her know if they would be interested in becoming involved in the project. Those who contribute will have access to all of the materials, which can be used to build custom courses. Stage one of the project is to gather and test materials, while stage two will involve organising and packaging them. Gary MacGillivray (UVic) observed that the University of Puget Sound has open source materials available for Linear Algebra.

In the spirit of collaboration, particularly among Lower Mainland institutions, Nora Franzova announced that Langara College will be offering Numerical Analysis in the Fall semester and asked members to let their students know. Julie Peschke (Athabasca University) commented that students from her institution might be able to take the Numerical Analysis course if it were available on-line, an option that Langara will consider.

8.4. Webmaster Report—Ian Affleck

Ian reminded members about the information available on the website, including minutes of past meetings and subcommittee reports. Members were reminded to provide Ian with updated information for their institution's process for exam exchanges (i.e. web links or contact names). Any changes to members or contact information should also be sent to Ian as soon as possible. A suggestion was made that we should have a way to share information on the textbooks we are using for our major courses, but full discussion of this was deferred to item 8.5 on Wednesday's agenda.

Ian commented that a number of individuals had not yet provided him with a picture for the website. He asked whether it would be alright to locate and use pictures on the BCcupms Members page that are already on other institutional websites or on personal web pages. A few members expressed reluctance to have their picture on the web. Ian will check with individuals before posting their pictures.

Leo Neufeld is still responsible for managing the BCcupms listserve, while Susan Chen has taken over management of the listserves for both the Statistics Subcommittee and the Mathematics for Elementary Education group.

Once again there was discussion of how to pay the $40 - $50 annual fee for our URL. In the past this has been paid by UFV, but this is not fair. It was suggested that the host institution pay each year, which seemed reasonable however there were some logistical difficulties that would need to be sorted out with respect to invoicing and actual payment. Rick Sutcliffe (Trinity Western University) offered that there might be a way to arrange this through him for as little as $15 per year. Ian will discuss this further with Rick to see how this might work.

ACTION (BCcupms members): Send Ian information on how to best access copies of final exams from your institution.

ACTION (BCcupms members): Send Ian any necessary updates with respect to members or contact information.

ACTION (BCcupms members): Send a photo to Ian for inclusion on the Members page of the BCcupms site if you have not already done so.

ACTION (Ian Affleck and Rick Sutcliffe): Discuss possible arrangements for maintenance of the BCcupms URL.

[At this point in the meeting Rick Sutcliffe (Trinity Western University) and Nessim Tariq (Alexander College) gave their institutional reports as they were both unable to attend the meeting on Wednesday. These reports have been included with the other reports (Item 9, Wednesday).]

The Tuesday Session of the BCcupms adjourned at 4:50 p.m.

BCcupms and Secondary School Teachers Session

1. Introductions and Opening Remarks

Regrettably, with the exception of Chris Becker (BCAMT), no secondary school teachers attended this year's meeting. Likely this was related to the provincial job action.

2. Reports

2.1 BC Secondary Schools Math Contest—Clint Lee (see attached report, page 25)

Clint gave notice that he will be stepping down as the provincial coordinator for the Math Contest within the next few years and that a replacement will be needed. Ideally, an interested person can be identified soon, as this would allow for an easy transition to take place over the next couple of years.

2.2 BCAMT—Chris Becker

Chris briefly described the pathways in the new secondary mathematics curriculum, providing a rough breakdown of the proportion of students in each stream: for grade 10 (20% in AWM 10 and 80% in FPM 10); for grade 11 (20% in AWM 11, 30-40% in FM 11 and 40-50% in PM11). Grade 12 percentages are not known yet as these courses will be offered for the first time this Fall. He noted that the percentages are more accurate for Lower Mainland schools than for the interior, where there may be a variation of plus or minus 10%, with Lower Mainland schools skewed more towards the Precalculus stream. It has been a hard sell to boost numbers for the Foundations course as parents still see the Precalculus stream as more rigorous and as leaving more doors open for students' future studies. At the same time, some students who seemed weak in grade 9 are doing very well in the Foundations pathway. FM 11 seems to be meeting the needs of these students and does contain good topics.

Some schools, including his own, are offering two separate Math 9 courses, one that follows the full curriculum and another that focuses on "core" material. Some students take the "core" course, then the regular Math 9 course, and then proceed through, while at other institutions students will go from the "core" course to AWM 10.

Provincial exams are required for the grade 10 mathematics courses. They were expected to be entirely on-line beginning in January, but this did not go as smoothly as intended. A short window of opportunity was provided for schools to request to have paper exams, though it was so short that many missed it, causing complaints.

There was some general discussion about the new BC Education Plan, although it was felt that it was too early to predict what the implications of the document would be.

Chris reminded members about "Questions Worth Asking", a book published by the BCAMT about assessment in mathematics classrooms, and recommended it as a good catalyst for discussion within mathematics departments. Three of the 15 chapters are available to preview on the BCAMT website (www.bcamt.ca, currently being reconstructed). It is available through the BCAMT for $15 ($5 conference rate at the BCcupms meeting). Members can contact Chris to purchase a copy. Another book is being considered on the topic of differentiated instruction, or at-risk learners.

Job action made this year a challenging one for professional development activities, however a number of conferences were held, including the BCAMT Fall Conference in Burnaby in October 2011 and the New Teachers Conference in Surrey in February 2012. The big Northwest Fall Conference is planned for Victoria, October 18 – 20, 2012, in partnership with Washington and Oregon. BCcupms members were encouraged to attend this conference, and also invited to consider joining the very active BCAMT listserve which has over 1000 members.

2.3 Implementation of the New WNCP Curriculum

Chris was asked to comment on his impressions of how the implementation of the new curriculum is proceeding. He indicated that teachers are beginning to buy in to it, but that the process is still not complete. There is a wide spectrum of acceptance. There is hope that the new curriculum will help address some of the conceptual gaps (including understanding of fractions) that students in the past have exhibited. However, there is a lack of adequate support to help teachers make the pedagogical shift required by the new curriculum. The BCAMT is trying to fill the gap by providing workshops.

3. Adjourn to Reception. The session adjourned at 5:30 p.m.

Many thanks to the textbook representatives, who generously hosted a lovely reception.

WEDNESDAY, MAY 16, 2012

Plenary Session

1. OPENING REMARKS

1.1 Introduction of representatives

1.2 Attendance lists
Nora Franzova circulated the attendance lists.

1.3 Announcements from the host: Jean MacLeod announced the time and location for the Greek dinner.

2. CORRESPONDENCE

There was no correspondence to discuss.

3. REPORTS

3.1 BCCAT— Christi Garneau

Christi introduced herself as the new articulation coordinator. She handed out a two-page Admissions & Transfer Update (dated April 2012) which summarized the recent activities of BCCAT (available under "Documents and Links from the 90th BCcupms Meeting" at http://www.bccupms.ca/Conference_Documents/Meeting_90_VCC/BCCATreport.pdf). A highlight of the document was news that "BCCAT is moving ahead with plans to enable all institutions to perform sending and receiving functions within the BC Transfer System". Institutions will be able to go into the system and declare that they will receive transfer credit for particular courses from other institutions, and the sending institutions will be notified. Also of note was that a preliminary review of Associate Degrees is underway. Christi sent around the list of outstanding transfer requests, reminding members to follow up with these at their institutions, and also reported that the archives of the BCcupms (dating back to the 1960s) are now safely housed at the BCCAT offices downtown.

3.2 PIMS—David Leeming, PIMS Education Associates Coordinator

PIMS Education Associates
The PIMS Education Associates program has been in place for over five years now. It has had many successes. Currently there are six PIMS Education Associates in BC and four in Alberta. Langara College, Okanagan College, University of the Fraser Valley and Thompson Rivers University have renewed for another three years. Unfortunately, two institutions in BC – Camosun College and Vancouver Island University are not renewing at this time. A number of outreach activities have been carried out by the PIMS Associates in BC in spite of the teachers' job action. These included Math Challengers and Math Fair (OC), Math Mania (Douglas), elementary school projects by Elementary Education students (Langara), Math Mania and outreach into a First Nations school (UFV).

PIMS First Nations Outreach
In February 2012, a Math Mania event was held at Edward Milne Community School in Sooke. T'souk-e Nation Chief Gordon Planes opened the event with his ceremonial drum. Volunteers included senior students from the school and parents. Over one hundred people, both aboriginal and non-aboriginal, attended, some from as far away as Port Renfrew. As a result of this successful Math Mania event, we have been invited by the Pacheedaht Nation (Port Renfrew) to hold a community Math Mania event in late August.

PIMS Education Outreach
In April 2012, Melania Alvarez-Adem, Sichiko Noguchi (PIMS UBC) and David Leeming (PIMS UVic) held Math Mania events in the elementary schools in Sointula and Alert Bay. Volunteers were recruited from among the secondary school students, parents and grandparents. Each school had about 50 students (K-7) and they were given time out of class to participate in the Math Mania activities.

3.3 ABE—Jean MacLeod (Report prepared by Costa Caravas), Vancouver Community College

Our meeting included various reports and updates from: ABE Steering Committee (Trudy Archie), BCcupms (Costa Karavas/Jean MacLeod), BCCAT (Christi Garneau), Adult Literacy Fundamental Working Group (Tanya Boboricken), and Joint Annual Meeting of BCCAT (Robert Ferro).

Five new courses were approved for articulation and six other courses were approved for re-articulation. The new courses are: North Island College's Math 036—Intermediate Mathematics for Trades (intermediate level), Camosun College's Math 137—Algebra and Triangle Trigonometry (advanced algebraic), Native Education College's Math 62-72—Business and Technical Math (advanced business/technical), TRU-OL's Math 0633—Pre-Calculus (provincial level), and University of Fraser Valley's Math 096—Algebra and Trigonometry (provincial Level). VCC re-articulated all six of its math courses; the only change to those courses was the pre-requisites.

Last year the Math Working Committee received funding to research the implications of the new Western and Northern Canadian Protocol (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 subcommittee made recommendations to the Working Committee regarding a list of outcomes for an ABE mathematics course which would articulate with the WNCP Foundations of Math. The subcommittee proposed two new courses to the working group: 1. Advanced Level—Foundations Mathematics and 2. Intermediate Level Mathematics. The learning outcomes of the two new courses were reviewed, and in some cases revised, and accepted. The Working Group would like to continue with the project by looking at developing a new course that aligns with Foundations of Math 12.

The Working Group drafted a brief letter to the Steering Committee regarding students with learning disabilities. It is included at the end of this report.

There was one presentation: Kie Tio, an instructor at VCC, presented on "Maple 15 Explorations in ABE Math Education." It was a great overview of some of the more common features of the recently released version of Maple. Kie demonstrated how he utilizes Maple in his ABE classes.

Costa Karavas and Robert Ferro will stay on as co-chairs for next year. Beth Carver was the vice-chair for the past two years and has now retired from CNC, so a new vice-chair will be chosen at a later date.

The next meeting will be on February 28 and March 1, 2013, at Vancouver Community College (Downtown Campus).

3.4 Math Challengers—Leo Neufeld

You can use three different taps, alone or in combination, to fill a pool. If you use taps B and C only, it will take 9 hours to fill the pool. If you use all three taps (A, B, and C), it takes 7 hours. Tap B can fill the pool on its own in half the time it takes tap A on its own. How many hours would it take for tap C to fill the pool on its own?

This is just one question from this year's Provincial MC Competition in the Bull's-Eye stage. In the Problem Solving section, students were given 4 such questions and allowed 12 minutes to answer all of them.

Math Challengers is a wonderful opportunity for students, in Grade 8 or 9 who love Math, to spend part of a day doing math problems individually and in teams with the prospect of trophies, medals and prizes when it's over. Brief talks or other math-related activities are also part of the experience.

This year about 470 students participated at the Regional level. This number was down by about 100 from last year. Grade 8 teams came from 25 different schools and Grade 9, from 28 schools. Students may also compete as individuals.

Top teams and individuals then advance to the Provincial competition, which was held at UBC this year. It's a really fun day for all!

There is a third round for the top Grade 8 students. It's called the Intramurals. In this competition two teams each from BC, Washington and Oregon square off.

All this is possible because of dedicated volunteers and committed teacher coaches, as well as financial assistance from organizations like PIMS, BCAMT, BCHydro, IBM and APEGBC. UBC, SFU, BCIT, Camosun College and Okanagan College provide generous competition site hosting support. Our wish is to have even more participation particularly from outside of the Lower Mainland.

Besides the main competition site on the Lower Mainland, we also have competitions on Vancouver Island and in the Okanagan. Satoshi Tomoda coordinates the Okanagan event.

For information about MC: http://www.apeg.bc.ca/mathchallengers/index.html

For previous competition problems: http://www.math.ubc.ca/~adler/challengers/

3.5 Changing the Culture—Nora Franzova

Nora gave a brief description of this year's Changing the Culture Conference, the annual, free, PIMS-sponsored event, which will take place on May 18 at SFU's Harbour Centre campus. Details of the plenary talks, workshops and panel discussion can be found on the website (http://www.pims.math.ca/educational/changing-culture). At the conference, the 2011 PIMS Education Prize will be awarded to Marc MacLean. Dates for next year's conference have not yet been set.

4. Demo of Maple, Maple TA and the MAA PTS

The committee participated in a webinar from Maple which provided an overview of the features of Maple 16 and Maple TA. Maple TA can be used to create assignments and tests, keep track of grades, and analyse item statistics. Some concerns were expressed about the documentation available for users who wish to create their own questions. According to the Maple representative, the User Guide has been updated extensively and is quite useful.

5. Publishers' Representatives

Sean O'Reilly, a technical specialist from Pearson publishing, demonstrated the interactive figures embedded in the electronic version of the Briggs, Cochran, Gillet & Schulz Calculus text. Over 650 of these figures have been included within the appropriate sections of the text in order to support visualisation of the calculus concepts. Users can click on, drag, and manipulate the figures. The figures are created using Mathematica, but no special software is needed to interact with them. They are accessible through My MathLab or with the ebook. Students with the paper version of the book can purchase access codes for MyMathLab or Math XL which enable access for two years. It is expected that these types of figures will also be incorporated into other textbooks over time, and eventually will be compatible for use with iPad or Android devices.

6. Keynote Address: Teaching and Learning with the Brain in Mind—Bob Aitken

Bob Aitken educated and entertained the articulation committee with his informative talk on contemporary brain research and its implications for teaching and learning.

7. Report from the Nominating Committee

The nominating committee reported that Jim Bailey was willing to continue as Chair and that they had found no other willing candidates. Jennifer Hyndman (UNBC) officially nominated Jim (seconded by Natasha Davidson (Douglas)). Nora called for nominations three times. There being no further nominations:

Jim Bailey was acclaimed as Chair of the BCcupms for another two-year term.

8. NEW BUSINESS

8.1 Use of mobile technology—Nora Franzova

Nora described a new activity that she used with her Math for Elementary Education students this past year: she asked them to make a short movie to demonstrate a mathematics concept. Students were able to use whatever format they felt comfortable with, but Nora loaned students who needed it her iPad. She showed a few of the movies (viewable at http://courseweb.langara.bc.ca/noraf2011/movies/). She recommended the activity as one that interested and motivated the students, who seemed to be very comfortable with this medium, and encouraged instructors to try this even if they did not feel competent with the technology yet themselves.

8.2 Calculus-based statistics courses: What type of second year statistics course do students need?—Jason Loeppky

Jason opened the discussion of second-year (calculus-based) statistics courses. The two major questions were: Is a calculus prerequisite really necessary for second-year statistics courses? Also, when calculus is required, to what extent are calculus-based topics covered?

In response to the first question, a number of institutions reported having second-year statistics courses that do not have a calculus prerequisite, including UNBC, Camosun, and Kwantlen. Jennifer Hyndman described UNBC's STAT 240 course which has a common lecture, but allows students to choose one of three lab options depending on their interests: Health & Human Development, Natural Resources & the Environment, and General Interest. They find that this course is more appropriate for students pursuing studies in health sciences, biology or medicine than their calculus-based course which is still offered for scientists and engineers (STAT 371). At Camosun (Susan Chen), they offer a second-year Statistics for Life

Science course that no longer has a calculus prerequisite, but also offer a separate calculus-based Engineering Statistics course. While some institutions are offering non-calculus-based statistics courses for other groups of students, it seems that a calculus-based course is still needed for engineering students. Bruce Dunham (UBC) reported that Kevin Keene (UNBC) had written to the engineering accreditation body and had received emphatic confirmation that a calculus-based statistics course is required.

With respect to the question of how much calculus is used in the calculus-based statistics courses, there was a wide variety of responses. At UBC (Bruce Dunham), science students take a statistics course that has two mathematics courses as its prerequisite, but in fact there is no calculus in the course. The prerequisite is there to ensure a certain level of maturity in the students. When it comes to assessing transferability of courses from other institutions they try to gauge the degree to which the statistics course taken is geared towards science versus arts students, and are often guided by what the sending institution is requesting. They are not too worried about whether or not there is a calculus prerequisite. Their experience is that students generally have more trouble with the statistical thinking than with the mathematics. Kwantlen's calculus-based statistics course does not really require much calculus, and Mike Nyenhuis noted that the biggest difference between the calculus- and non-calculus versions of the course is the algebraic skills of the students taking the courses. Allan Majdanac (Douglas) commented that it is a challenge for instructors to find the right level for calculus-based statistics courses, given that some of the topics that could be covered require multiple integration, yet students only come in with a Calculus II co-requisite. Ken Towson reported that Capilano does venture into the multi-variable and double-integration topics in their second-year statistics course, but they keep the examples simple and use the TI-89 for harder functions.

8.3 Culturally responsive education—Veda Roodal Persad

This item was withdrawn from the agenda.

8.4 Evidence-based results about learning—Bruce Dunham

Bruce briefly described Carl Wieman's project at UBC which involves taking a science-based approach to the study and improvement of teaching and learning. While there is an abundance of anecdotal reports on effective teaching techniques there is relatively little scientific evidence on what really works and what doesn't. There are many challenges in designing proper experiments in educational contexts, including ethical considerations and dealing with large numbers of confounding factors. Bruce talked about some of his own efforts to identify and help his students overcome common errors and misconceptions. With one class he tried to take errors that occurred on a midterm, drew students' attention to the errors, warned them that the items would be re-tested, and then did so on the final. He found that if ¼ of the students made the initial error, ¼ of the students made the error on the final, though it was not necessarily the same students. When he tried again with a different class, this time using Clickr technology, he had more success. He invited and challenged members of the committee to think about interventions they might make in their teaching that would allow for measurement of effects. He suggested that collaborative experiments across institutions could be worth pursuing. It was proposed that the topic of evidence-based results about teaching and learning might be an appropriate theme to incorporate into Sharing Math next year.

8.5 Do we need a textbook listing?—Natasha Davidson

Natasha observed that when institutions are considering new textbook adoptions, it is nice to know what others are using, and that this information is not always easy to find online. Ian Affleck suggested that the BCcupms website could have a listing of texts in use at the different institutions, sorted by course description or name. By show of hands, roughly half of the group indicated that they would find such a listing useful. There was general agreement that representatives would send information about their current textbooks to Ian, who will compile the data and create the appropriate web page(s) on the BCcupms website. Representatives will need to ensure the list is updated annually.

ACTION (All representatives): Send a list of all current textbooks for first- and second-year mathematics and statistics courses that have articulation agreements to Ian Affleck (ian.affleck@ufv.ca).

ACTION (Ian Affleck): Compile the textbook information and organise it for presentation on the BCcupms website.

ACTION (Jim Bailey): Add "Update of Textbook Lists" as a standing agenda item to remind representatives of the need to do this annually.

9. INSTITUTIONAL REPORTS

Before beginning the reports, the Chair (Jim Bailey) asked if there had been any course changes in the past year that could affect the agreement among sending institutions to accept each others' Calculus courses. There were none. (Issues surrounding Calculus II and the Core Calculus Agreement had already been discussed. See Math2 and item 8.1 in Tuesday's minutes).

ATHABASCA – Julie Peschke

All our courses are in an individualized/home study format over a 6-month time period. Three 2-month extensions may be purchased at an extra cost. Exams are hand-written and invigilated in the student's locale. Students may enrol at any time throughout the year. If the student enrols on or before the 10th day of a month, the course start date will be the 1st day of the next following month. Due to the 'open university' mandate of the institution, our first year courses do not have formal pre-requisites.

Each student has an assigned tutor, all of whom have a minimum of a Masters Degree in either Mathematics or Statistics. Two new initiatives are happening at AU.

1. The first is the creation of a Bachelor of Science with a major in Applied Mathematics degree which is now in the approval stage at the upper University administration level. It has already been approved through all the Faculty and General Faculty Councils. It has yet to be sent to the Alberta Government for final approval. If approved, this degree will be coupled with minors from Finance, Computing Science, and Education for distance learning.

   The proposal is for a four-year Bachelor of Science degree program major in Applied Mathematics to be offered at a distance through Athabasca University in Alberta. The primary student population would be those students who wish to obtain a degree in mathematics but who are unable, for a variety of reasons, to attend classes at a traditional university.
   This program is intended to help students develop a relatively wide range of applied mathematical skills which have direct applications within fields of endeavour such as scientific and medical research, some branches of computing science, finance, engineering, architecture, and other math-related disciplines. It offers students a broad base of core mathematics courses while including senior level mathematics courses geared towards a wide variety of applications of mathematics in the every-day world. The program is distinctive in its distance mode of delivery. As far as can be determined at the present time, it is the first online Bachelor's degree of its kind in Canada, and even in North America. Online Bachelor's degrees which involve applied mathematics currently, at least, tend to fall within specific math-related disciplines such as Accounting, Finance and Business Management and do not embrace the generality of application to many different fields of endeavour as does this program.

   Articulation: Our current suite of senior level courses is not as rich as we would like it to be. Perhaps there is some way of allowing our students to articulate with senior level mathematics/statistics courses in B.C. institutions as a portion of the optional course credits in applied mathematics for this degree. We would be interested mainly in courses delivered either online or at a distance, in this case.

   In addition, for those B.C. colleges which do not have degree programs in mathematics at this point in time, this degree might be an option for some of their students who live in relatively remote regions and do not have ready access to a traditional university setting for such a degree. Students can transfer up to 30 credits into the program.

2. The second initiative is one which began in 2008. It was conceived of as an, open to the public, online MATH SITE (http://math-site.athabascau.ca/index.php) built on the premise of putting a human face on mathematics. Since that time, a portion of it, called the **AU Math Centre**, has developed into a full blown remedial / refresher mathematics program whose intent is to help students make the transition from school to university-level mathematics or math-related courses. Currently it has over 70 online interactive tutorials covering topics from the new Grade 10 through Grade 12 Alberta high school mathematics curricula. The AU Math Centre also provides self-help on exam anxiety, various learning styles, personal learning strategies, diagnostic tests, approaches to self-study of the topics on the site, and an array of practice exercises.

   Articulation: In 2013, we will be opening a blended, distance learning, math refresher course (MATH 101: Transitional Mathematics: 0–university science credits), using both textbook-based and online pedagogies in conjunction with the AU Math Centre. This course, as is our current MATH 101 program, will be a Pure Math 30 equivalent. Because it is offered at a distance, MATH 101 may be an option to prepare some students with less than optimal mathematics backgrounds for entry into British Columbia post-secondary institutions.

ALEXANDER COLLEGE – Nessim Tariq

At Alexander College there is no change in course offerings to report for the purposes of articulation at the 90th meeting of the BCcupms.

Alexander College is offering Math 099 (started in Fall 2011). This is a non-credit course to help students succeed in Math 100 (Pre-Calculus). The table below summarizes some information about mathematics courses and college enrolments for 2011-2012.

Term	Courses	Number of Sections	College enrolment
Summer 2011	Math104, Math105 Math 232	5	336
Fall 2011	Math 099, Math 100, Math104, Math105 Math151, Math152	13	1058
Winter 2012	Math 099, Math 100, Math104, Math105 Math151, Math152	12	1023
Spring 2012	Math 099, Math 100, Math104, Math105 Math151, Math152 Math 232	12	1015

BC INSTITUTE OF TECNOLOGY – Winona Cordua-von Specht

There were no changes to mathematics or statistics courses this year. Enrolment is stable.

CAMOSUN COLLEGE – George Ballinger (for Peggy Tilley)

Precalculus and First Year: Enrolment in all first-year mathematics courses remains strong. We have been running some non-base funded sections on "expanded capacity" but the college is phasing this out over the next two years.

Second Year: Enrolment in second-year courses is steadily declining as a result of the cancelation of second-year physics and computer science two years ago. We still have about 12 students in each of our second-year mathematics course so they remain just barely viable. Our second-year students include full-time and part-time students interested in mathematics, teaching high school mathematics, mathematics & economics, and chemistry. We also have part-time computing science and physics students who do their mathematics courses at Camosun before moving up to UVic to take second-year physics or computing science. We plan to run our regular second-year program for the upcoming 2012/2013 year but starting Fall 2013 we likely will move to a 1.5 year math program at Camosun and have full-time students transfer up to UVic in January to complete their second year.

Budget cuts: Camosun has just finished cutting 4% from its budget. Our College Executive Team (CET) made the decisions with some input from the Deans but no consultation across the college. Among the cuts were the loss of the associate dean positions, learning skills faculty, and the first-year university transfer computing science program. Within hours of the announcement of the budget reductions we produced a chart of university transfer programs (including mathematics) that require first-year computing science. However, CET still maintains that UT computer science is a stand-alone program. Unfortunately, since UT computer science resides in the School of Trades and Technology (rather than Arts and Science) and is a collection of courses rather than a credentialed program, it was an easy target for a budget cut. We are still working at getting back at least one section of each of the first-year computer science courses for the upcoming year. Sigh.

CAPILANO UNIVERSITY – Deanna Baxter

Course changes: Nothing to report in current courses.

New program at Capilano: Liberal Studies Bachelor of Arts (LSBA) has its first cohort of students entering their third year. In 2013/2014, our department will be offering "Math 300: Mathematics and Creative Arts" for the LSBA students. Math 300 is being developed by Lisa Lajeunesse and will explore interdisciplinary connections between Math and Visual Art, Music, Literature, etc.

Enrolment trends: Stable

Retirement: Wendy Lynn is retiring. We are currently searching for a statistician for an RPT-4 position.

COLLEGE OF NEW CALEDONIA – Tracey Wall (submitted by Nicolas Buck)

1. No new courses or course changes which would ramify on articulation agreements or enrolments.
2. By a decision of the College management (and contrary to the recommendations of the department) proposed offerings in university-credit mathematics courses for the 2012-2013 academic year are reduced from last year.

COLLEGE OF THE ROCKIES – Jim Bailey

College of the Rockies will be offering all the Mathematics and Physics courses which we offered last year. I am still exploring collaborations and we will be offering Engineering Statics and Dynamics with North Island College this winter.

COLUMBIA COLLEGE – Sam Ekambaram

- Columbia College has been awarding Associate Degree in Arts and Science since September 2005.
- In Mathematics, we are offering at least one second-year course every semester to facilitate students who need to accumulate more credits to qualify for an Associate Degree in Science at Columbia College.
- This summer we are offering Math 206, Mathematical Statistics. Students majoring in Computer Science/ Engineering/Business take this course. This summer there are 17 students enrolled in this course.
- We are planning to articulate an intensive version of precalculus for weaker students who are identified by our Math Placement Test. The content includes the precalculus topics as well as a review of intermediate algebra and trigonometry. To cover this enriched content we are planning to have 8 hours per week.
- We are pleased to announce that Columbia College is preparing to own its very own building and the move is expected in April 2013.

COQUITLAM COLLEGE – Gera Belchev

- No course changes that will influence transfer agreements;
- Enrolment was strong in 2011/2012 academic year.

DOUGLAS COLLEGE – Wesley Snider

Enrolments are up this past year. We have more sections this summer than ever. The increased enrolments together with some existing time-releases will allow us to hire a contract for Fall 2012 and Summer 2013 terms.

We had our first intake of 11 students start our Graduate Diploma in Mathematics and Science Teaching in Fall 2011. Susan Oesterle taught the first course, Teaching Mathematics.

Developmental Studies Mathematics has been moved to our faculty (Science and Technology). Though it has not joined our department, it is now "administratively" closer to us.

KWANTLEN POLYTECHNIC UNIVERSITY – Michael Nyenhuis

No changes this past year, though MATH 1130 and 1230, our Calculus for the Life Sciences will change, and will look more like UFV's new outline (Neuhauser will be the text). The interim Dean, Graham Rankin will be replaced by a permanent dean, and Graham will rejoin the math department. We are developing a B.Sc. in Applications of Math (provisional title). That is going through the internal approval process. Jim Gunson, who retired from Kwantlen several years ago passed away March 23, 2012.

LANGARA – Nora Franzova

College and department news:

Registration was strong all 3 terms. Almost all courses had waitlists. Due to budget constraints only few additional sections were offered.

The college is heavily focusing on attracting more international students. There is interest in creating joint programs with India in Nursing (already happening), and maybe engineering.

The Math and Stats department went through a restructuring process this year. The form of the administrative body of the department was re-evaluated and changed from a department chair and 3 area coordinators, to department chair and two assistant chairs with specific designations. Student advisor and computer assistant positions remained as before.

New/ Old:

Stat 3222 was introduced as the only new course this year. No transfer agreements were made, since the course specifically services students in the Langara BBA program.

The department is working on creating 2 Associate degrees in math (Associate of Science and Associate of Arts).

Transfer Agreements:

Last summer our Math 1153/1253 (Intro to Calculus I (Part 1&2)) received transfer to Math 110 at UBC for 6 credits. The same course can transfer to UBC Math 100 as 3 credits for science majors.

NICOLA VALLEY INSTITUTE OF TECHNOLOGY – Al Fukushima

NVIT has no changes in their math course delivery.

- Delivery of Math 040, 050, 051, 060 at the College Readiness level
- Business Math, BUSM 200 (Finite) and Intro Statistics (BUSM 207), Intro Stats for the Social Sciences (Stat 203) are currently offered

- Math 100 (Pre-Calculus), 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

NORTH ISLAND COLLEGE – Jason Diemer

Jason was unable to attend this year's meeting and sent his apologies. He submitted the following report after the meeting:

There are no changes to any of our courses. Enrolment in Calculus and Linear Algebra is strong, softer in Math for Elementary Education. Math 102 (Calculus for the Life Sciences) and Math 151 (Finite Mathematics) were resurrected last year, with modest enrolment.

We deliver several of our courses to multiple college sites via interactive television (ITV). This system will be upgraded over the summer to provide high-definition feeds.

Our Educational Division has been restructured. In particular, responsibility for the School of University Studies has been divided as follows: The "Dean of Instruction - School of Access and Upgrading, School of University Studies: English, Math and Science" is now Tony Bellavia. The "Dean of Instruction - Business, Tourism, Fine Arts and University Studies: Humanities" is Dr. Gregory Cran.

NORTHERN LIGHTS COLLEGE – Hongbin Cui

There have been no course changes in the past year. In the coming year, we will review Math 190 - Principles of Mathematics for Teachers, and may revise the course in response to the changes at SFU.

NORTHWEST COMMUNITY COLLEGE – Mona Izumi

Enrolments in Calculus were up a little this year in both Prince Rupert and Terrace. Intro Stats numbers remained consistent. Although we are a small institution we compete for Stats students with the Business Administration department.

Everyday Mathematics for Arts students and Mathematics for Elementary Teachers were offered with consistent numbers. Unfortunately due to cuts to our program these courses will not be offered in the next academic year.

I will be retiring at the end of this summer. Either Erfan Zahra'i from Prince Rupert or Regan Sibbald from Terrace will replace me on this committee.

OKANAGAN COLLEGE – Clint Lee

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 with the exception of the Penticton campus which experienced about a 50% increase in enrollment. This is due primarily to the new Jim Pattison Centre of Excellence building which is has been built to Living Building Challenge standards and is being called one of the world's greenest buildings.
- The Math/Stats department has changed the name and calendar description of our Finite Mathematics course, Math 111. The intention of the changes is to make the name and description of the course more accessible to Arts students. Contrary to expectations, little resistance was experienced when these changes were presented to Education Council.
- We have changed the Calculus II prerequisite for our Stat 230 – Elementary Applied Statistics (our calculus-based statistics course) to a co-requisite. We plan to make the same change to our Math 251 – Discrete Mathematics course.
- The Math/Stats department is working with the Computer Science department to develop a Data Analysis option for the BCIS degree program. This option has the potential to increase enrollments in some second-year mathematics and statistics courses. It also includes a new third-year mathematical statistics course and a new fourth-year mathematics course in pattern recognition.
- With the exception of some minor adjustments that may be necessary due to budget constraints there will be no changes in the Mathematics and Statistics offering at Okanagan College in the 2012-2013 academic year.
- We continue to be primarily a service department, offering courses for the OC BBA and BCIS degree programs and for seven two-year technology and business diploma programs.
- We continue to offer first-year university transfer mathematics and statistics courses at the Kelowna, Vernon, Penticton and Salmon Arm campuses and to offer selected second-year mathematics and statistics courses in Kelowna, and the second-year linear algebra course in Vernon and Salmon Arm. We also plan to offer the calculus-

based statistics course in Vernon in Winter 2013. Low enrolments in second-year courses continue to be a major concern.

- Satoshi Tomoda and Shawn Desaulniers held SNAP Math Fairs at the Vernon and Penticton campuses this spring. The events were very successful. At both campuses, students from OC MATH 160 – Math for Elementary School Teachers – were involved.
- Satoshi Tomoda has organized a Math Challengers event for the Okanagan Region for the last two years. This is the first time that Math Challenger events have been held in the interior of British Columbia.
- Each month from October to April, the department publishes a Math Problem of the Month on the department website. Students in secondary and middle schools in the college region are invited to submit solutions. Small prizes are award for correct solutions. Over the past couple of years, the response to the POTM has declined. However, the department is continuing the program for now, since we do get positive comments about it from teachers, mainly through the Math Contest.
- A half-time member has decided to retire this year. The position created has been filled through regularization in accordance with the OCFA Collective Agreement.
- One member of the department is going an Extended Study Leave next year. As a result OC will be posting some non-continuing work.
- Our new Dean of Science, Technology and Health, Yvonne Moritz, has been in place for about 18 months. She has been a positive addition to the college and has been quite supportive the Associate of Science program.

SELKIRK COLLEGE – Ross Bates

Calculus I (M100) and Calculus II (M101) have no changes to report.

Calculus for Social Sciences (M140) has not been taught recently, but will be on offer again for Winter 2013.

Math for Teachers (M180) and Problem Solving in Foundational Math (M181) have no changes to report.

Due to budget cutbacks, all of our second year math/science courses as well as first-year engineering courses have been "suspended", and will not be offered next year. This means Calculus III (M200), Differential Equations (M215), and Linear Algebra (M221) as far as math courses go. Faculty layoffs have occurred from the School of University Arts & Sciences.

SIMON FRASER UNIVERSITY – Ladislav Stacho

1. Our Industrial Mathematics program was stripped to only one stream: Operations Research (Surrey). It originally had three streams. The program was discontinued at Burnaby. Preliminary discussions were held with the Beedie School of Business regarding a possible joint program.

2. For 2012/2013 we are continuing the offering of themed special topics courses at the 3rd year level that target math minors in science and technology majors. We plan to have two offerings for 2012/2013, one in Burnaby and one in Surrey.

3. We are successfully continuing the quizzes in our main Faculty of Science Mathematics courses: MATH 150/151, 152, 251, 232 and MACM 201, and it has now become a permanent practice in these workshop-based classes.

4. Evening midterms (BBY): We are test-running evening midterms for our multi-session large service-calculus classes. This would make it practical for an instructor to teach two sections of the same course without preparing an extra exam. Assigning an additional instructor to teach an extra section of a course makes it necessary for both the primary instructor and the workshop coordinator to closely coordinate the course with an extra person. Another expected benefit would be to have final-like seating arrangements for exams.

5. MACM 316 tutorials are experimenting with a 'workshop' format. In Spring 2012, there were 6 regular workshops and one special workshop for the final exam. There were 2 TAs and, together with the instructor, two would attend the workshop on a particular day. It seems the workshops are a more effective way of getting students to learn and they are also more fun for everyone involved. We will continue this experiment.

6. We are now planning a redesigned Minor program for the Faculty of Arts and Social Sciences (FASS) students that is especially aimed at Economics, Psychology and PDP-bound students—who are currently the bulk of FASS students who enroll in our upper-division courses.

7. MATH 298-0 Undergraduate Seminar: This course will provide a broader view of a wide spectrum of mathematical topics as well as expose students to an arsenal of tools most mathematicians use in their professional life. Fundamental mathematical topics will be presented with an emphasis on real-life applications as well as interdisciplinary characteristics. Along with this, students will learn basics of LaTeX, Maple, Matlab, etc. Among other things, passing this course should help the student make more informed selections of upper division courses. The prerequisite is MATH

152 or 155 or 158. This will be a 0-credit required course. Faculty will volunteer to participate one or two weeks in the semester when this is offered to present material close to their research area and/or on some of the software tools we use.

SPROTT-SHAW DEGREE COLLEGE – Josiah Akinsanmi

Nothing to report.

THOMPSON RIVERS UNIVERSITY – Rick Brewster

There was a fair amount of staffing changes in 2011-2012 at TRU. During the summer of 2011 we had 5 hires. Dr. Suzanne Feldberg was hired on a 3 year LTC to replace Fae DeBeck who retired. Suzanne's background is Math Ed. She is the contact for MFEE. Dr. Paul Ottaway was hired on a 2 year LTC to replace Robb Fry. Paul has worked for many years on the Waterloo Math Contests and is now involved in the BC Secondary Schools Contest. Dr. Gunog Seo was on a 1 year LTC to replace Don Noakes during his secondment to administration. Dr. Fatma Mahmoud and Josh Sorge were hired as sessionals.

There are no changes that would affect transfer at first and second year. At the upper level, we continue to offer 20 courses as listed in the calendar (10 per year). These courses are augmented with directed studies. This year we offered: Abstract Algebra 2, Math & Music, and Algebraic Number Theory.

We have students enrolled in both of our two new combined programs with Economics and with Computing Science.

First Nations: This year we ran First Nations TRU-Start. The program consisted of 3 courses: English, Biology, and Statistics (TRU STAT 1200). The program was taken by a cohort of First Nations students. They receive credit at both high school and TRU. The program is likely to run again next year.

TRU Open Learning: The university continues to work towards improved interaction between the OL and Face-to-Face groups on campus. The Math & Stats OL and F2F faculty enjoy a good working relationship with Chris Morgan acting in the liaison role. Essentially the academic content and standards are the responsibility of the academic department, but minor updates, student services, and delivery are done in the OL part of the university. Transfer of OL courses is done by OL with the Math & Stats department only involved if there are major changes made to the course. (Those changes are then approved by the department's curriculum committee.)

THOMPSON RIVERS UNIVERSITY (OPEN LEARNING) – Chris Morgan

The TRU-OL Math group is working closely with the TRU Math & Stat Dept to better align our common courses. We have just gone through a re-numbering of all courses offered on campus and through Open Learning. We are now focusing on aligning our common courses in Mathematics and Statistics to help make the transition for our students between face-to-face format and distance learning format as seamless as possible. We are also working closely with the TRU Math group to find an appropriate assessment tool and online resources for some of our common first year courses.

We have a new faculty member that has joined the OL Math group. She is Natasha Mandryk and she has been assigned as one of the OLFMs for Math 2111, Calculus III.

TRINITY WESTERN UNIVERSITY – Rick Sutcliffe

Introduction: Trinity Western is a fully AUCC-accredited privately-funded public Christian University offering a variety of graduate and undergraduate programs in the arts, humanities, fine arts, sciences, education, theology, 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. Day student head count reached 3500 in 2003, but declined to about 2700, by 2008. However, overall head count has increased substantially to 4400 including all campuses (Langley, Bellingham, and Ottawa) and the rapidly expanding extension and adult degree completion programs. Trinity Western University is the only Canadian university to get an A+ ranking for overall quality of education in the National Post survey for each of the last six years.

Structure: The Mathematical Sciences department lives in the Faculty of Natural and Applied Sciences and encompasses Mathematics, Statistics, Computing Systems and Informatics, Physics, and Engineering.

Faculty: The Mathematics group consists of: Professor Rick Sutcliffe (Chair), Professor Don Ariel, Assistant Professor Sam Pimentel (as of Aug 15, 2012), Sessional Assistant Professor Stephen Benecke (as of Aug 15, 2012), Assistant Professor Herbert Tsang, Associate Professor Arnold Sikkema (also Physics & Engineering), and Sessional Instructors Terry Neufeld and Rachel Oberto (both Physics).

Programs: The degree program in Mathematics with Computing Science is now in its thirtieth year, that in Mathematics in its twenty-sixth year and both have numerous successful graduates in a wide variety of Mathematical and IT fields. The department is responsible for computing and ISYS programs, Physics, and also for the first two years (transferable to UBC) of Engineering.

The math major has suffered because of the changes in requirements for education (a subject degree is no longer required for secondary teaching), but many individual courses are still doing well as other science students are now more commonly taking a concentration in Mathematics to go along with a Chemistry or Biology major. For instance, enrollment in Discrete Math II and in Mathematical Statistics is about 20). We've recently had an influx of students into a math major who also major in HKIN, Nursing, Music, History, and other subjects.

Course Changes: There were a number of these last year, reflecting a university-wide redesign in the wake of earlier enrollment reductions. These included changing Analysis from second year to third and expending it to include Topology (to be taught next semester for the first time in the new 4 S.h. format), Number Theory (fourth year to third), Abstract Algebra (third year to fourth), and changing both Differential Equations and Numerical Analysis from two three credit courses to one four credit course. Proposed new courses are largely in Engineering and Computing.

Enrollment: Following many years of steady increases, and in accord with changing BC demographics, Canadian dollar TWU saw 25% enrollment declines after 2003 but this bottomed out, and we anticipate substantial growth in the next few years. Likewise, computing enrollments were substantially down across North America, and our department shared in this pain. These numbers have now reversed, particularly for Canadian students, with the Faculty of Natural and applied Sciences now at near record high enrollments in all subjects except computing.

Facilities: The faculty of Natural and Applied Sciences this year opened the $4M Jack VanDyke research centre this fall (named after our recently retired dean). This allowed our department to recover some space. We anticipate opening our fourth campus (Richmond BC) in about a year, though it seems unlikely it will offer science courses.)

Research & Grads: Rick Sutcliffe has interests in combinatorics, and has been heavily involved in standards work for computing languages. He writes books, articles, and columns, and gives talks on a variety of social and ethical issues in technology. Don Ariel publishes a steady stream of papers on modeling laminar flow of viscous fluids (fuel cell applications). Sam Pimentel models geomorphological processes, particularly glaciation. Stephen Benecke does work in graph theory. Herbert Tsang models protein folding and comparable processes. Arnold Sikkema has research interests in synchronization in biophysical phenomena; the character of physical laws; reductionism and emergence. Senior students usually produce an undergraduate thesis and several have gone on to graduate schools with considerable success at SFU, UBC, UofA, McGill, Trent, Western Ontario, QUT Brisbane, and other schools. Many others have become high school math teachers or work for government or industry.

UNIVERSITY OF BRITISH COLUMBIA-OKANAGAN (Mathematics) – Wayne Broughton

Since its inception in 2005, the Okanagan campus of UBC has experienced tremendous expansion, in terms of physical facilities, programs and student numbers. From 2005 to 2011 the total number of students has more than doubled (to about 7900). In the Sciences, at least, we are now reaching our capacity and seeing the first-year intake start to plateau (increasing by only 4% from 2010 to 2011, compared to total campus growth of over 11%).

In MATH 100 (Calculus I) we had 783 students registered in both Summer and Winter sessions of 2011, an increase of 9% over 2010, but we are anticipating only a modest increase in 2012. In MATH 101 (Calculus II) we had 638 students registered in 2011, an increase of 18% over 2010, and anticipate similar growth in 2012. For the business calculus stream (taken by students in the Bachelor of Management program), in 2011 we had 303 students in MATH 116 (Differential), an increase of 6%, and in MATH 142 (Integral) there were 105 students, an increase of 62%.

Finally, in MATH 126 (Basic Mathematics: An Aboriginal Perspective) we held steady at 34 students registered in 2011, but anticipate growth in 2012. This course is designed to provide a transition into calculus by starting with slightly lower prerequisites (Foundations of Math 11) and organizing material around some images and concepts that might be broadly familiar to students from various First Nations cultures. Anecdotally, this has been going well and has led to improved student achievement, but it is still in its early days and as yet there has been no quantitative assessment of its success compared to our regular Pre-calculus stream.

There have been no significant changes to our courses that will affect transferability. However, there are some new degree programs that might be of interest. We have introduced a Combined Major in Physics and Mathematics, which allows students with an interest in theoretical physics and applied mathematics to get a strong background in both without having to do a double major. Our newest program is the Major (and Minor) in Statistics, but our Statistics representative will speak to that.

UNIVERSITY OF BRITISH COLUMBIA-VANCOUVER (Mathematics) – Wayne Nagata

All our Calc 2 courses now cover about 9 hours of material on infinite sequences and series (including Taylor series). These courses are:

UBC MATH 101 Integral Calculus with Applications to Physical Sciences and Engineering,
UBC MATH 103 Integral Calculus with Applications to Life Sciences,

UBC MATH 105 Integral Calculus with Applications to Commerce and Social Sciences,
UBC MATH 121 Honours Integral Calculus.

Incoming transfer students with courses that meet the Core Calculus agreement will still transfer as before, but if they have not had a calculus course with infinite series and if infinite series is not included in the Core Calculus agreement and if the student plans to enroll in a course that assumes knowledge of infinite series (e.g. UBC MATH 257 Partial Differential Equations, UBC MATH 300 Introduction to Complex Variables, UBC MATH 316 Elementary Differential Equations II), then they should be advised to take an online non-credit module (under development) to learn the material.

All our Differential Equations 1 courses now have Linear Algebra 1 as a prerequisite. These courses are:
UBC MATH 215 Elementary Differential Equations,
UBC MATH 255 Ordinary Differential Equations,
UBC MATH 256 Differential Equations,
UBC MATH 265 Linear Differential Equations.

The abstract algebra course offerings for 3rd and 4th year Honours students have been revised and expanded. In particular there is a new course: UBC MATH 323 Introduction to Rings and Modules. Other courses have had their titles or descriptions changed.

UNIVERSITY OF THE FRASER VALLEY – Cynthia Loten

Data Analysis Certificate (DAC): This is up and running, with the first intake in Fall 2012. It is a post-degree certificate that is completed in about 10 months. The DAC consists of computing and statistics courses with the aim of producing students who can "house, extract, manipulate and maintain data in real-world ways in which it arises" and who can use statistical techniques to "collect data correctly, assess its quality, analyze it, and present the information effectively to decision makers" (www.ufv.ca/math/Data_Analysis.htm). The entrance requirements are a bachelor's degree of any kind, first-year statistics with a high enough grade or second-year statistics, and first-year programming. The statistical environments SAS and R will be used, both of which are industry standards. R is a free software environment and we are working in close partnership with SAS. We have put on a late summer section of first year statistics to accommodate international applicants who don't have the required statistics background.

Program Review: This was completed last fall with the site visit taking place last September. Our reviewers were impressed with our collegiality and commitment to teaching. We have been working away at implementing their suggestions, some of which are reflected in the next three items.

Calculus for Biologists: There was a lot of interest in some sort of biology calculus, but also a great deal of concern about students being able to change their minds in regards to their area of study without having to redo first-year calculus. Our solution was to designate one section (this may be expanded in the future) of our regular Calculus I course as being for biologists: the learning outcomes will be the same, but all of the examples will come from biology. We have created a new Calculus II course, MATH 118: Calculus II for Life Sciences, specifically for the biology students. To keep students' options open, we have included MATH 118 (with a high enough grade) as a prerequisite where our current MATH 112: Calculus II, is used. This is being implemented for the first time this coming academic year.

Relabeling Statistics Courses: We are most of the way through the process of relabeling our statistics courses. If all goes well, our statistics courses will have the label STAT rather than MATH.

Changes to Upper Level Requirements: Currently, we require Math Majors to take a minimum number of upper level credits in Math, but only specify one particular course as required: MATH 340 (Introduction to Analysis). We are in the process of changing the required upper level classes to the following: MATH 312 (Vector Calculus), MATH 322 (Complex Variables), MATH 340 and one of MATH 339 (Introduction to Applied Algebraic Systems) or MATH 439 (Modern Algebra).

Enrolment: The enrolment of our first year courses continues to be high, about the same as last year, with long wait lists on service courses for business. Enrolment in second year and above continues to be stable. We have had a strong showing in some of our core second-year courses: 60 students in MATH 211: Calculus III, 40 students in MATH 221: Linear Algebra and 34 students in MATH 265: Transition to Advanced Mathematics (our "how to do proofs" course).

Miscellaneous: We continue to work on an applied statistics minor.

UNIVERSITY OF NORTHERN BRITISH COLUMBIA – Jennifer Hyndman

University

- University Enrolment is flat
- Looking at a first year Foundation Year series of courses for sciences
- Developing transfer agreements to increase number of foreign students

Departmental

- Honours Mathematics degree approval in progress.

Mathematics

- One topic dropped from MATH 200 Calculus III as it is taught in other upper year courses.
- During the Fall 2011, Winter 2012, Spring 2012 season (change over previous year)
  - 203 students took MATH 100 Calculus I (down 7)
  - 139 students took MATH 101 Calculus II (up 16)
  - 141 students took MATH 115 Precalculus (up 26)
  - 128 students took MATH 150 Finite Math for Business and Economics (down 51)
  - 224 students took MATH 152 Calculus for Non-majors (up 19)
  - 15 students took MATH 190 Math for Elementary Educators (down 16)

Statistics

- New STAT label for all statistics courses taught by the department now in effect.
- During the Fall 2011, Winter 2012, Spring 2012 season (change over previous year)
  - 197 students too MATH 240 Basic Statistics (up 35)

UNIVERSITY OF VICTORIA – Gary MacGillivray

There are no imminent changes to report that would affect articulation. We are, however, taking a hard look at our first year calculus offerings through a broad discussion involving all stakeholders across campus. After this sequence of meetings has concluded, we may bring forward some changes for consideration next year. It is too soon to know what, if anything, might be proposed.

VANCOUVER COMMUNITY COLLEGE – Jean MacLeod

There are no changes to report.

VANCOUVER ISLAND UNIVERSITY – Cobus Swarts

1. No major course changes to report which would affect any transfer agreements.
2. We are still facing funding cuts. What the impact of this will be on the math courses, as other programmes are cut, is unclear.
3. VIU is currently conducting a "Summative Assessment" of its programmes to help determine the future course of its programmes.
4. Enrolment numbers are strong. First year courses, for the most part, are full. Our Math Minor continues to be popular: we have anywhere from 12 to 15 students progressing through the programme.
5. Pre-Calculus will be offered at our satellite Duncan campus for the first time in many years this coming year. There may be a distance education component to it. There also seems to be some interest in offering Calculus at our Duncan campus.
6. A new Statistician was hired and will be starting in the Fall. A new Biostatistics course will be developed in conjunction with the Biology department.
7. We were able to resurrect our Math Club this year, and it seemed to be quite popular with the students: they organized numerous games nights and study help sessions. We also celebrated Pi-Day this year.
8. Our students took part in the Kryptos competition this year and did quite well (4 teams, 10 participants). One team solved one of the three cipher challenges. One student received second place (for solving two of the three challenges) among individual competitors.

YUKON COLLEGE – Tim Topper

No report was submitted.

ACTION (Jim Bailey): Jim will send letters to North Island College, BCIT—Operations Research, Royal Roads University, and Quest University, inviting them to next year's BCcupms meeting and reminding them of the importance of sending a representative to participate in discussion of articulation issues.

10. COMMITTEE BUSINESS

10.1 Topics for our 91st Meeting

A number of topics for discussion at our 91st meeting were suggested, including: further discussion of collaborative teaching between institutions (Clint Lee), varieties of Linear Algebra courses (Nora Franzova), "mindful" mathematics—what it is and how we do it (Jennifer Hyndman), and the Core Calculus Agreement (Gary MacGillivray).

10.2 Date and Location of the 91st Meeting

The 91st meeting will be hosted by the College of New Caledonia in Prince George. Dates will still need to be confirmed, but are tentatively set as May 14 – 16, 2013.

In 2014, the 92nd meeting will be held at Kwantlen Polytechnic University, campus to be determined.

10.3 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 Susan Chen.

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

11. Adjournment of the Wednesday session

The Wednesday Session of the 90th meeting of the BCcupms adjourned at 3:45 p.m.

Many, many thanks to Jean MacLeod and the Mathematics Department at Vancouver Community College for all their excellent work in hosting us for this meeting.

List of Committee Members Present
Concurrent Math/Stats – Tuesday, May 15, 2012(a.m); Plenary Session – Tuesday, May 15, 2012 (p.m.); Secondary Teachers Session – Tuesday, May 15, 2012 (attendance not taken); Plenary Session – Wednesday, May 16, 2011 (a.m./p.m.)

Name	Institution	MATH	STATS	TUES	TEACHER	WED
Ian Affleck	University of the Fraser Valley		x	x		
Josiah Akinsanmi	Sprott-Shaw Degree College	x				x
Jim Bailey	College of the Rockies (Chair)	x		x		x
George Ballinger	Camosun College	x		x		x
Ross Bates	Selkirk College	x		x		x
Deanna Baxter	Capilano University	x		x		x
Chris Becker	BC Association of Mathematics Teachers (President)	x		x		a.m.
Gera Belchev	Coquitlam College	x		x		x
Laura Billing	British Columbia Institute of Technology		x	x		x
Rick Brewster	Thompson Rivers University	x		x		x
Wayne Broughton	University of British Columbia (Okanagan)	x		x		
Susan Chen	Camosun College		x	x		x
Winona Cordua-von Specht	British Columbia Institute of Technology	x		x		x
Kevin Craib	Langara College		x			
Hongbin Cui	Northern Lights College	x		x		x
Natasha Davidson	Douglas College	x		x		x
Shawn Desaulniers	Okanagan College	x		x		
Malgorzata Dubiel	Simon Fraser University	x		x		
Bruce Dunham	University of British Columbia—Statistics (Chair of Statistics Subcommittee)		x	x		x
Sam Ekambaram	Columbia College	x		x		x
Suzanne Feldberg	Thompson Rivers University		x	x		x
Nora Franzova	Langara College (Vice Chair)	x		x		x
Al Fukushima	Nicola Valley Institute of Technology		x	x		x
Christi Garneau	BC Council on Admissions and Transfer					x
Jennifer Hyndman	University of Northern British Columbia	x		x		x
Mona Izumi	Northwest Community College	x		x		x
Gabriela Kakushkin	Vancouver Community College		x	x		x
Costa Karavas	Vancouver Community College			x		
Lisa Lajeunesse	Capilano University			x		p.m.
Clint Lee	Okanagan College (Kalamalka Campus)	x		x		x
David Leeming	Pacific Institute for the Mathematical Sciences			x		x
Richard Lockhart	Simon Fraser University (Statistics)		x	x		x
Jason Loeppky	University of British Columbia (Okanagan)		x	x		x
Cynthia Loten	University of the Fraser Valley	x		x		x
Gary MacGillivray	University of Victoria	x		x		x
Colin MacLeod	Kwantlen Polytechnic University		x			
Jean MacLeod	Vancouver Community College	x		x		p.m.
Allan Majdanac	Douglas College	part	part	x		x
Wayne Matthews	Camosun College	x		x		
Susan Milner	University of the Fraser Valley					p.m.
Chris Morgan	Capilano University/Thompson Rivers University (Open Learning)	x		x		x
Wayne Nagata	University of British Columbia (Vancouver)	x		x		x
Leo Neufeld	Camosun College (Retired)			x		x
Michael Nyenhuis	Kwantlen Polytechnic University	x		x		x
Susan Oesterle	Douglas College (Secretary)	x		x		x
Iain Pardoe	Thompson Rivers University (Open Learning)	part	part	x		x
Julie Peschke	Athabasca University		x	x		x
Veda Roodal Persad	Langara College/Thompson Rivers University (Open Learning)		x	x		x
Wesley Snider	Douglas College	x		x		x
Ladislav Stacho	Simon Fraser University					p.m.
John Stegman	Selkirk College		x	x		a.m.

List continues on the following page…

List of Committee Members Present (Continued)

Name	Institution	MATH	STATS	TUES	TEACHER	WED
Rick Sutcliffe	Trinity Western University	x		x		
Cobus Swartz	Vancouver Island University	x		x		x
Nessim Tariq	Alexander College	x		x		
Satoshi Tomoda	Okanagan College	x		x		x
Tim Topper	Yukon College	x		x		x
Ken Towson	Capilano University		x	x		x
Tracy Wall	College of New Caledonia	x		x		x

*North Island College (regrets sent), BCIT's Operations Research and the Ministry of Education did not send representatives this year. Quest and Royal Roads have not yet sent a representative to any of the BCcupms meetings.

BC Secondary School Mathematics Contest 2012
Report to the BCcupms

On May 4, 2012 the Final Round of the BC Secondary School Mathematics Contest was written at 7 provincial 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.

Participating institutions are:

Capilano University	(CapU)
College of New Caledonia	(CNC)
College of the Rockies	(CotR)
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)

Some of these institutions did not run the Final Round of the contest this year. 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 that did run the Final Round.

Institution	Final Round		Top Three Scores		Averages	
	Juniors	Seniors	Junior	Senior	Junior	Senior
CapU	DNW					
CNC	DNW					
CotR	18	6	75, 33, 33	53, 49, 43	18	20
Doug	DNW					
Lang	16	11	90, 89, 80	92, 81, 65	54	59
NIC	DNW					
NWCC	9	6	49, 29, 28	41, 40, 39	24	34
OC/UBCO	39	14	48, 47, 46	47, 44, 42	32	31
TRU	31	30	48, 46, 42	51, 48, 41	26	29
VIU	34	32	57.5, 51, 49	57, 54, 46	28	32
UFV	60	48	70, 64, 59	79, 66, 58	NA	NA
TOTAL	207	147				

Approximately 900 Juniors and 500 Seniors throughout the province wrote the Preliminary Round this year. The top reported Junior and Senior Preliminary scores were both 60 and 56, respectively, 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 354 students participated in the Final Round this year. This number is down significantly from previous years, due in large part to the labour disruption in the schools. Several institutions decided not to run the Final Round of the contest this year because of this.

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 4, with some type of activity provided for the sponsor 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.

Two institutions instituted the practice of separating certain junior contestants to allow them to work on certain portions of the contest in teams. Having done over the last two years at OC generated a significant level of interest among local middle schools, resulting in a noticeable increase in participation among grade 8 students.

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: Nora Franzova at Langara College; Sherrie Wang 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 Hot 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 themselves. Indeed, they have indicated that their entire departments are involved with hosting the contest. Special thanks should go to John Grant McLoughlin, who, as a professor in Mathematics Education at the University of New Brunswick, continues his involvement with our contest even though he is at other end of the country, and to Mike Szestopalow a past contestant from Vernon who is now a PhD student in mathematics at Waterloo University.

Furthermore, the people who submitted problems and met at Okanagan College last May to put together the initial drafts of the contest papers and reviewed them as they developed are: Chris Odgers (Cam), Jim Bailey (COTR), Nicholas Buck and Tracy Wall (CNC), Clint Lee and Satoshi Tomoda (OC), Nora Franzova (Lang), Mona Izumi (NWCC), Ian Affleck (UFV), Annie Marquise (Doug), and John Grant McLoughlin (UNB). 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 Brain Storming 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/2012/MathContestBCCUPMReport_2012.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 2013 contest are:

Preliminary Round:	Wednesday, April 3, 2013
Final Round:	Friday, May 3, 2013

Respectfully submitted to the BCcupms on May 15, 2012 by

Clint Lee
Okanagan College, Vernon

MINUTES OF THE STATISTICS SUBCOMMITTEE
90th BCcupms MEETING, MAY 15 – 16, 2012

Present: Bruce Dunham (UBC), Laura Billing (BCIT), Kevin Craib (Langara College), Suzanne Feldberg (TRU), Gabriela Kakushkin (VCC), Jason Loeppky (UBCO), Al Fukushima (NVIT), Ian Affleck (UFV), Veda Roodal Persad (Langara, TRU-OL), Colin MacLeod, (Kwantlen University), Iain Pardoe, (TRU O-L), Allan Majdanac (Douglas College), Julie Peschke (Athabasca University), Richard Lockhart (SFU), John Stegman (Selkirk), Susan Chen (Camosun), Ken Towson (Capilano University).

Chair: Bruce Dunham

Acting Secretary: Richard Lockhart

1. Approval of Agenda

Motion of approval of agenda: Moved: Veda Roodal Persad; seconded: Al Fukushima.

Carried unanimously.

Note: A draft agenda was circulated via the Stats mailing list; the list is maintained at Camosun and relevant parties should be included. Details about the list are at https://list.camosun.bc.ca/mailman/listinfo/stats.

2. Approval of minutes of the Statistics Subcommittee Session of the 89th meeting

Motion of approval of minutes: Moved: Al Fukushima; seconded: Susan Chen.

Carried unanimously.

3. Matters arising from minutes

Flexible pre-major program: There had been no further progress on the proposed flexible pre-major, largely due to on-going revisions of the major programs at UBC and SFU. In addition a new major program was appearing at UBC-O, which would also need incorporating into any pre-major scheme.

4. Institutional Reports

Athabasca University

Statistics courses are mainly offered by distance learning. There are three Statistics courses in total. One (STAT 215) is introductory and uses no software package. Many nurses comprise the 2000 or so who take this course. Business has its own Statistics program, whereas Psychology uses designated STAT courses. Another introductory course is computer oriented and uses Minitab. The follow-up course teaches applied methods, and uses SPSS.

One STAT section is taught face-to-face in Calgary – called "group study" at the university. This has also been done in Edmonton and Lethbridge in the past. Most study is individualized with a tutor available by email or phone. Some paper-based course materials exist, including a text, study guide and student manual.

BCIT

The college offers no articulated Statistics courses. All introductory level courses are specialized to the programs students are in. Software depends on the instructor and program, and may include Minitab, graphing calculators or R. There have been no major changes recently to the Statistics offerings.

Camosun College

This past year one section of MATH 116 (Elementary Statistics) was lost that had been under-filled in the previous year.

More teaching technologies have been embraced in some courses: i-clickers were used in MATH 116 and one section of MATH 216 (Applied Statistics) was split into two sub-sections: one online and the other blended (a mixture of online and face-to-face) with a 2-hour lecture each week.

One of two MATH 116 sections (taught by the same instructor) was designated as the i-licker section and 5% of the course grade was allocated for clicker questions. Originally marks were given both for correct answers and participation but students reported that they found this stressful and so marks were simply awarded for participation. Some of the positive observations

associated with clicker use were the following: better attendance, slightly higher retention and success rates, students were more engaged, better understanding of concepts and statistical reasoning and a moderate increase in test scores. On the final exam, we noted an increase in the correct answers for concept questions.

MATH 216 online and blended were taught using the publisher website StatsPortal and the course management system Desire2Learn (D2L). Lecture notes were presented in OneNote on a Tablet PC and then saved as PDF files and posted on D2L after each class. Online office hours were conducted via Collaborate (Elluminate). As expected, we noted that compared to standard face-to-face classes, many of the students in the online and blended classes work full-time. In terms of performance, online and blended sections had slightly lower but comparable retention and success rates than the standard face-to-face and slightly more A+ and F grades. Only students in the online and blended sections did online homework. Pleasing was that many students made multiple attempts on online assignments until they were satisfied with their marks even though each assignment was worth less than 2% of the course grade. Starting next fall, all sections of MATH 216 will be doing online homework using StatsPortal.

Capilano University

There have been no big changes of late. Two Statistics courses are offered: MATH 101, introductory for non-science students and MATH 205, a calculus based introduction. Calculators are used in MATH 101, with a TI-89 required for the second year course. COMM 290/291 use Excel for business statistics. The Devore text is adopted in the second year, although students find the price is too high. Faculty have developed their own sports-based text.

The institution has shown a resistance to labeling Statistics courses with a STAT code.

Douglas College

The college offers two Statistics courses. The introductory course without calculus is doing very well. The calculus-based course ran twice recently at half capacity. There are hopes to grow the course, which uses the Devore textbook.

Kwantlen University

Introductory, business, life sciences and mathematical Statistics courses are offered. A new course in inferential statistics is being developed. Efforts have been made to work towards a BSc program but some resistance has been met from the administration at the university.

Business Statistics course enrollments have long been very healthy. However recently Business created a new Statistics course with no calculus prerequisite and enrolment in the corresponding STAT course plummeted.

Langara College

The Department of Mathematics and Statistics is 28 strong, of whom nine teach Statistics. The department welcomed a new chair in May.

There have been healthy numbers on introductory and intermediate Statistics courses. At first year level there are three courses: business commerce; arts, university transfer (UT) and higher level UT (for commerce and science). The nursing degree now requires an introductory Statistics course.

The large waiting lists every semester coincide with Langara being at 107% enrolment overall. International enrolments have been strong, with extra sections often driven by international student numbers.

For software, Stat-graphics Centurion is free to Langara students. Certain courses do introductory methods with Excel.

Finally, mixed mode courses: some business math courses are offered in mixed mode but development has just started for such course offerings in Statistics. A mixed mode introductory course will run in fall 2013. This will be partly on-line (25%), part face-to-face (75%).

Nicola Valley Institute of Technology

Two Statistics courses are offered: one university transfer course STAT 203 (taken mostly by social work students), the other a copy of Business Stats BSM 207. The institute is partnering with TRU for a social work degree and may cancel the Statistics requirement - in part due to low success rate – and replace it with some other math requirement in the social work degree.

Al uses Moodle face-to-face, and likes making use of on-line discussion / chat groups in his classes. Students are requested to buy a scientific calculator with basic statistics mode. Excel is introduced in the classes.

The institution is primarily designed for First Nations students. Although students enroll from all over, over 90% are First Nations. Such students appear less plugged in to modern technology and the world as a whole. Success and retention rates are about 50%. Class sizes are very small, typically between five and ten.

Selkirk College

Despite static enrollment, there are budget cuts for next year. As a consequence all second year courses are being suspended. The first year course has two modes: one classroom-based, tailored for people interested in outdoor activities, one on-line – no software, involving limited mathematics. Lab times are offered one period per week, and are unstructured sessions.

The college is investigating repackaging courses to build certificate programs, tailoring to suit employment opportunities in the region. For example, Cominco will give preference to applicants with the appropriate background.

Simon Fraser University

Personnel: Charmaine Dean has left SFU to take up the position of Dean of Science at Western University in London, Ontario. Jiguo Cao has taken a leave of absence to go to Western. We have hired a biostatistician, Michelle Zhou (Waterloo grad, Harvard post-doc) starting 1 July 2012.

Budget: Budgets are tight but the situation is not too bad.

Enrollments: enrollments have risen very rapidly over the past four years. Below are the recent undergraduate numbers:

2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
1686	1963	1725	2616	2807	3409

The biggest source of growth has been in service courses.

Course revisions: There have been no revisions to our introductory courses. We have recently overhauled our undergraduate programs quite substantially; the changes will be implemented sometime in 2013, possibly as early as 1 January. Here are highlights:

1. The minor program has been completely altered to focus on applied statistics and data analysis. The program is intended to complement degrees in other disciplines.
2. Introduction of STAT 340, statistical computing.
3. Adoption of learning outcomes for each course and for the overall program. This is motivated by a desire to be clear about the status of computing in each course and in the program overall.
4. Creation of three applied courses, cross-listed with three new graduate service courses: STAT 445 Multivariate Analysis, STAT 475 Discrete Data Analysis, STAT 485 Time Series Analysis.
5. Deletion of STAT 402/602, deletion of STAT 400.
6. Modification of STAT 285 to delete time series.

Thompson Rivers University

The STAT 120 course is introductory, and has one section dedicated to tourism students. STAT 200 is offered for science students. In addition there are a few upper level Statistics courses.

Thompson Rivers University, Open Learning Division

There is one STAT course, STAT 102 (taught with De Veaux *et al.*, "Intro Stats" and a graphing calculator TI-83), which continues to do well.

University of British Columbia, Okanagan

Following the hire of Ryan Lekivetz on a three-year term there are now four faculty in Statistics. There has been an increasing enrolment in service courses, driven in part by a new BSc major program in Statistics. The inception of the major also lead to the creation of STAT 311, Modern Statistical Methods (modern methods with an emphasis on computing), STAT 407, Sample Surveys, STAT 410, Introduction to Generalized Linear models, and STAT 400, Statistical Communication and Consulting.

The end goal is to get the program accredited by the Statistical Society of Canada as an incentive mechanism to increase enrolment. The institution overall is not at capacity.

Introductory courses all have a one-hour lab component. SPSS is used for STAT 121 and 124, R or JMP-IN for STAT 230. There is some enthusiasm for shifting to using only R.

University of British Columbia, Vancouver

The department has had another busy year, with preparations well advanced for the move into our new building. We are scheduled to relocate to our new home late August. From then Statistics teaching will mostly be in the new building, and access to larger lecture halls is expected to lead to a reduction in the number of sections offered for our STAT 2xx courses.

The number of students on Statistics programs has risen considerably in recent years. The total number of students on all our undergraduate programs stood at 145 in Fall 2011, compared to 121 the previous year and 110 in 2008. These figures exclude minor students. The reasons behind this increase are unclear, though the trend is not reflected in the number of students graduating: only twenty graduated from our programs since June 2011.

Subject to approval by UBC senate, there were some minor changes passed regarding our major programs. In particular

(i) the English requirement is replaced by a more general Communications requirement;
(ii) CPSC 110/210 are replaced by CPSC 111/211;
(iii) the PHYS/CHEM requirement is weakened;
(iv) graduation is possible with 120 credits.

The Carl Wieman Science Education Initiative (CWSEI) approved funding in 2011 for a two-year project improving certain targeted undergraduate Statistics courses. Dr. Gaitri Yapa was hired and commenced in September 2011. Work is ongoing transforming STAT 241/251, 302, 305 and developing materials for STAT 200 and 300.

In addition to the CWSEI project, funding was secured from UBC's Teaching and Learning Enhancement Fund to develop WeBWorK to facilitate on-line homeworks, starting with STAT 200 and 241/251. Dr. Djun Kim has been appointed to work on this project. WeBWorK is a freely-available system developed by the American Mathematical Association. Resources for Statistics assessment resulting from our project will be available to the wider community.

Despite numbers having been consistently healthy, STAT 100 will not be offered during the 2012/13 academic year. This decision was made in part due to the number of faculty on leave next year, but also reflected that the number of Science students taking the course was disappointing.

The proposed summer pilot using R cmdr in STAT 200 was not a success due to the software placing an excessive burden on the local server. This should be resolved for the next academic year, and the expectation is that R cmdr will replace Excel in STAT 200.

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

University of Northern British Columbia

There have been no changes to the Statistics offerings in the past year.

University of the Fraser Valley

The department is excited to be offering a new certificate in data analysis, beginning Fall 2012. This year-long program is designed for anyone who has a degree as well as courses in introductory statistics and introductory computing. It is a hands-on, applied program that should make graduates attractive to prospective employers. Two new courses (numbered 271 and 272) will be offered for the first time in Fall 2012 for students in this program (and for others who might be interested): one course is an introduction to useful topics in applied statistics (regression, ANOVA, experimental design, time series, survival analysis); the other introduces students to SAS and R software. The certificate program is rounded out with selections of courses in applied statistics and computing.

The department will be re-designing its statistics minor programs: a minor in applied statistics is likely.

The course in introductory statistics for nursing students has been removed from the calendar; nursing students now take the course in introductory applied statistics intended for any student who has at least Math 11. Some other Statistics courses (MATH 302, MATH 451) have also been removed from the calendar as part of the general housekeeping exercise.

As a result of a recommendation from an external program review committee, the MATH prefix is being changed to STAT for all Statistics courses. Three courses will be cross-listed as MATH/STAT, namely MATH/STAT 270, 370 and 450.

Vancouver Community College

There have been no big changes recently. The main course in Statistics is for nurses and dental hygiene. Numbers have remained quite healthy. The course requires the TI-83 calculator, although students can use computers should they wish. The students on the course are typically not technology-oriented.

5. Novel uses of technology in undergraduate Statistics teaching. (Susan Chen, Camosun College)

Susan Chen ran a session informing the group about learning technologies that have been tried in MATH 116 and MATH 216 at Camosun. The technologies used include StatsPortal, Desire to Learn, Blackboard collaboration for on line office hours, tablet PC, Camtasia (for screen video lecture capture) and i-clickers. Various merits and drawbacks of using each tool were discussed with examples.

Anyone wishing to have the slides or other information related to this presentation may contact Susan directly at chen@camosun.ca.

6. Election of Statistics subcommittee chair

Bruce indicated his willingness to continue as chair in the absence of other volunteers. His continuation was ratified later at the combined meeting.

7. Any other business

No additional business was forthcoming.

8. Motion to adjourn

Adjournment occurred by default due to shortage of time.