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

MINUTES OF THE 87th MEETING, MAY 12 – 13th, 2009

TUESDAY, MAY 12, 2009

1. WELCOME

Dr. Kathleen Scherf, President of Thompson Rivers University, welcomed the BCcupms to its 87th meeting.

2. ADOPTION OF THE AGENDA FOR THE 87TH MEETING OF THE BCcupms

The Agenda for the 87th Meeting was approved by consensus with the addition of: Math2. Math for Elementary Education: Report of the Subcommittee (to Tuesday's Mathematics Parallel Session), 3.1 Admissions Standards (to Tuesday's Secondary Teachers' Session), and 3.6 Math Challengers (formerly Math Counts) and 3.7 CMEF (to Wednesday's Reports).

3. ADOPTION OF THE MINUTES OF THE 86TH MEETING, HELD AT LANGARA COLLEGE

Richard DeMerchant requested that some changes be made to his Report from the Ministry of Education.

Motion: (moved by Leo Neufeld and seconded by Al Fukushima)

That the Minutes of the 86th Meeting be approved as amended.

Carried unanimously.

4. ANNOUNCEMENTS

4.1. Introduction of representatives

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

4.3. Announcements from the host, Fae DeBeck: Fae provided information on campus amenities and lunch options. She noted that registration for the Sharing Math Conference was still open and advised members of the publishers' displays in Room 3035.

4.4. Notice of Election: At this meeting elections for Vice-Chair and Secretary of the BCcupms will be held. These positions have two-year terms. Deanna Baxter, Leo Neufeld and Malgorzata Dubiel volunteered to form the nominating committee.

4.5. Conferences: Dave Van Bergeyk announced that the BCAMT 2009 Pacific Northwest Conference will be held in Whistler, October 22 – 24. Bruce Dunham announced that the Statistics Society of Canada is meeting May 31 – June 3 at UBC.

5. The Use of Clickers in the Classroom—Doug Baleshta (Thompson Rivers University)

Doug gave a presentation on the use of clickers (also known as audience response systems) for teaching. He began by describing research that was done as long ago as 1985 that showed a marked improvement in audience attention when interactive response formed part of the lecture. There are a number of systems to choose from, including TurningPoint, I-Clickers, and PRS. Doug noted that a UBC study found TurningPoint to be the most compelling, though they ultimately opted for PRS. At Thompson Rivers University, instructors use clickers in a variety of programmes and courses including their Automotive Technology Programme, Business, Biology, Philosophy, and Respiratory Therapy. They are used in both large and small classes.

Doug passed out two versions of clickers for members to try and noted that eventually web-enabled cell phones will be used. He described some of the specifications as well as prices of the devices which can often be bundled with textbooks at a

significant discount: receivers with no text are approximately $200, though some representatives will include the receiver or give a discount/rebate with orders of transmitters; the standard transmitter is $40 (bundled with a text) but $52 otherwise, and LCD transmitters come bundled with a text at $55 as opposed to $94. The Bookstore will also buy back the transmitters at end of the semester (for $20) provided they will be used again for the next semester.

Each device has an ID number that is associated with a student and can be tied to a learning management system or Excel grade book. Some instructors use the devices for marks while others don't. Doug gave the group an opportunity to use the devices to answer some questions and displayed the results of the responses immediately on Power Point slides: the responses were displayed in bar charts or pie charts. The results can be saved and analysed with Excel, or the sessions can be reset. Questions can be saved in the form of Power Point slides either on a memory stick or to the network.

Doug described some research he has been engaged in in order to investigate whether international students use clickers differently from local students, and to look at how students generally react to the technology. He shared some preliminary results of a survey he administered to his students.

Some general discussion of the use of clickers followed. Jim Bailey noted that he appreciates clickers for the qualitative rather than quantitative information they provide. They provide a way for us to quickly see what students aren't getting. He also noted that at the College of the Rockies, clickers have been used at Education Council meetings for votes on contentious issues. Bruce Dunham commented that they can be used badly or well. He agreed that it helps instructors to hone in on misconceptions. He observed that students sometimes don't like to admit they don't understand, and that seeing others not understand helps. Dan Henschell agreed that the anonymity helps to open up discussion. Negatives for using clickers included: students trying to crash the system; students needing to learn more; difficulties for some instructors to adjust to using them; batteries dying; and students forgetting or losing them. Although there does not seem to be definitive research proving that the use of clickers is effective, those who use them report that their students' results seem better. It seems likely that this is because the instructor has a much better idea of what the students understand. Doug observed that this generation is more amenable to this type of thing than previous ones were and that websites show that clickers are being used at all levels in the education system.

Mathematics and Statistics Subcommittee Sessions (held concurrently)

MATHEMATICS SESSION

Math1. Are Precalculus Courses Preparing Students for Calculus? Strategies for Student Success and Transitions from Secondary School—Malgorzata Dubiel (Simon Fraser University)

Malgorzata opened the discussion of whether precalculus courses offered at post-secondary institutions are preparing students for calculus. Recently SFU has been concerned about their Math 100 course. Their two main problems are that 1) many students who take this course assume they know it all, and that they don't need to study; and 2) students come in with extremely weak algebra skills that prevent them from doing well even if they work hard. There is some improvement in skills when students take the course, but not necessarily enough to ensure success in Calculus. In response to these concerns SFU has decided to require students to have a B- in Math 100 in order to progress to Math151 (the science-stream Calculus I course). However they are still searching for ways to motivate the students and for ways to deal with their weak algebra skills. They began revisions to Math 100 two years ago, looking specifically at needs for Calculus, but they did not change much. She asked members of the committee to describe the precalculus courses they offer and to comment on how successful they are in preparing students for Calculus. (A summary of the responses arranged alphabetically by institution follows).

Alexander (Len Berggren): They offer one precalculus course which has a prerequisite of PM11 and permission of the instructor. All students who do not have PM12 or have less than a B in it who want to take calculus must take precalculus first. The course covers the standard curriculum, but they are not happy with it. There is a lot of attrition. A new math course is being designed that will be something like precalculus, but different. Their current precalculus course is only 3 hours per week, and Len asked about other institutions who offered more hours. A few offer their precalculus courses in a 4 – 6 hour/week format. (It was commented that attempting to cover the Math 12 curriculum in 13 – 15 weeks is very challenging. The ABE Math 12 course runs 8 hours per week.)

BCIT (Winona Cordua-von Specht): They offer specialised, technical math courses that are geared for each programme. Students need a C+ in PM12 to get into Calculus, but it is very rare for students to get direct entry. Most do a technical mathematics course first. They typically have very weak algebra skills coming in. There is a unit on algebra review required for all technologies. The pass level is set at 50%, but if students get less than 60% they are advised to reconsider their next step.

Capilano (Deanna Baxter): Students need an A in PM12 for direct entry into Calculus. Otherwise they can take a math placement test. To register in the precalculus course, students need a C in PM12, a C- in 096 Basic Algebra, or an appropriate score on the placement test. Their precalculus course is an algebra and trigonometry course. They find that their students' algebra skills are the biggest problem. The course provides a good foundation in the basics of functions, but on completing the course, students are still unable to handle any complexity in the algebra. It would be helpful if these algebra skills were already strong before they took precalculus. Trigonometry, especially inverse trig functions, is another area of difficulty. Because the trigonometry comes at the end of the course, students can tune out of it and still pass the course. Only a C- in Precalculus is needed to progress to Calculus.

CNC (Nicholas Buck): They have been offering a precalculus course for over 30 years. Initially they had one course that focussed on preparation for calculus, but 10 or 15 years ago they observed a large number of students were taking the course who needed an elective for other degrees (like Education). They developed a one-off algebra/geometry course for this other group. More and more international students are taking the precalculus course, even though it is an easier course than they need—though the quality of international students is dropping. Instructors are finding that they are having to do too much remedial stuff and that they have a difficult time getting to inverse trig. Although they have no statistics on student performance, their sense is that those who do well in the precalculus course also do decently in Calculus. (Malgorzata Dubiel commented that at SFU, students who have taken Calculus cannot enrol in the precalculus course, or Math for Teachers without special permission from the department.)

Douglas (Wesley Snider): They offer two precalculus courses: one for science stream students and one for business and social sciences students. Entry into these courses is through a basic algebra course or though achieving an appropriate score on the math assessment test. They found that the jump for students between the basic algebra course and the precalculus for science course was too big, so now unless students have a B or better in the basic algebra course, they must take the precalculus for non-science course first. A C- is required in the non-science precalculus before taking the science precalculus. The science precalculus does prepare students for the work ethic needed for Calculus. Its content is typical. The Math department uses Stewart's texts both for precalculus and calculus. This offers an advantage since exercises in the precalculus book anticipate calculus. Students who take the science precalculus course are better prepared for Calculus than Math 12 students, relatively speaking.

Kwantlen (Mike Nyenhuis): Students need a B in PM 12 for direct entry into Calculus. The precalculus course is the Math departments most popular course: they offer 14 sections per year. The course focuses mainly on algebra and functions, including trigonometry. The students' algebra does seem to improve but there is concern that it may not carry to the next course. Functions are a particular problem. Those who get an A in Precalculus do well in Calculus, having a 70% success rate. B's or C's have a 30% chance of succeeding. (Mike noted that A students tend to do well in their subsequent courses regardless.) The Math department has recently started offering a supported precalculus course which provides students with weekly lab assignments (worth 10% of their grade), which they can work on in the Math Lab. These assignments are marked, and students can correct mistakes and resubmit them as often as they like. The students and lab assistants seem to like it. No data has been collected on success, though Mike noted that some students write off the 10%.

Langara (Nora Franzova): They offer a Precalculus Algebra and a Precalculus course. Students must take both in order to get into Calculus. Recently they decided to increase the prerequisite for entry into science calculus to a B- in Precalculus, though only a C+ is needed for business calculus. For many years Langara has offered a course that is a mix of calculus and precalculus, which introduces the precalculus topics as they are needed. They are trying to encourage more students to choose this option. Students must have previously passed PM12 or have achieved an appropriate score on a placement test in order to register in it. Math faculty have also observed weak motivation among the precalculus students. Nora also noted that students tend to avoid doing the harder questions in the sections, which prevents them from reaching the level that they should.

North Island (Jason Diemer): Since they are a small college, their students tended to elect to take the grade 12 ABE course. Although they had developed a precalculus course, modelled after Math 12, it is no longer offered.

Northwest (Mona Izumi): They offer precalculus only sporadically. Most of the time it is left to ABE.

Okanagan (Clint Lee): The prerequisite for Calculus I is a C+ in PM12—all others need to take the precalculus course, which requires a 67% in PM11. All students who pass the precalculus course can go on to calculus. Nursing also requires this course as a prerequisite for entry, as do some other programmes. Those who do well in the precalculus course do well in Calculus. A study was done more than 10 years ago that showed a strong correlation between achieving an A or B in Calculus II and success in both prior courses. Weak algebra skills are a big problem.

Selkirk (David Feldman): They have a precalculus course on the books but haven't offered it for a while. Students have been taking Math 11 and Math 12 courses through ABE. As there was no distinction between students who had taken Math 12 and those who had taken the precalculus course, and there were problems with scheduling, it was decided that they would only offer the ABE Math 12. Currently students only need a C+ in PM12 for Calculus, but the Math department is trying to raise this. The Math 12 course helps students build a good work ethic. Students meet for 6 hours each week and submit homework almost every class. Homework is worth only 10% so some students don't bother with it. Although there is no statistical evidence, anecdotally students feel prepared and even find that Calculus is easier than this course. It follows the ABE provincial content, but it is a big jump from Math 11 and has a high non-completion rate (50%), which is something they would like to address.

SFU (Malgorzata Dubiel): For entry into Math 151 (the science-stream calculus) students need a B- in Math 100 Precalculus or an A in PM12. They also offer a calculus course with built-in review, Math 150, which only requires a C in Math 100 or a B in PM12. Currently Math 100 receives university credit, but Malgorzata cautioned that because the new WNCP curriculum contains a course called Precalculus Mathematics, the SFU Senate may decide that it should no longer be considered a university-credit course. Students' general algebra skills are a major concern at SFU. Some of the problems go back to topics that are taught even earlier than Math 12. As of 2006, students have been required to have a minimum of 70% in PM11 (or with 60 – 70%, or credentials from elsewhere, they have to attain a certain level on a quantitative skills test). For those who do not meet these requirements, SFU has developed the FAN X99 course. This course has a problem solving focus and is deliberately not simply a repeat of PM11. They focus on particular areas of weakness, including fractions, percent, equations of lines, and solving equations. A B- from this course is needed for admission to Math 100. The data seems to show that the FAN students are doing well in Math 100. They attribute their success to increased confidence, and improved problem solving and mathematical thinking skills. Dealing with these things is more crucial than dealing with some of the later mathematics topics.

UBC(O) (Qiduan Yang): They offer two precalculus courses: one standard course, and one for aboriginal students. Anyone can take the standard course, including international students who want to study math and learn English. A 64% in this course or 70% in PM12 is required for entry into Calculus. They use both Stewart's precalculus and calculus texts, finding that the exercises are well-designed to prepare students for Calculus. There is high demand for the precalculus course, especially from Business. Students with a D in the precalculus course won't pass calculus, but those with 60% or higher are able to. The version of precalculus for aboriginal students is discussed in more detail later under item 5.4 of Wednesday's minutes.

UFV (Greg Schlitt): Direct entry directly into Calculus I requires a B in PM12. Their precalculus course assumes the students have already completed PM12 with a C or C+. It aims to refresh their skills with a view to preparing them for Calculus. In general students don't do very well and there is a low completion rate. However students who do well in the precalculus course do well in Calculus, better than those who have only done PM12.

UNBC (Jennifer Hyndman): Their precalculus course has a PM11 prerequisite. Students who have recently taken Math 12 are not allowed to register in it. It is an algebra course. UNBC Math faculty are not satisfied with the current course and are about to embark on a new approach to preparing students for calculus. Beginning this summer they will offer three 1-credit hour continuing studies courses (60 contact hours) in Math 11 Algebra. The continuing studies courses are broken down into three 1-credit courses to allow students to start at a level appropriate to them and to retake portions as necessary. At the beginning of the precalculus course, students will be given a diagnostic test. If they fail, they will be strongly advised to switch to the continuing studies courses. The hope is to weed out the weakest students in order to be able to ramp up the level of the precalculus course. In some cases it will be possible for students to transfer some (up to 3) continuing studies credits into their degree.

UVIC (David Leeming): They offer the standard precalculus course, which is open to students who have a low PM12 grade or achieve an appropriate score on a math placement test. Students with an A or B in PM12 can take Calculus right away. They offer several sections of precalculus each year, serving approximately 200 students. They have a 25% failure rate (not including non-completion).

Vancouver Island (Dave Bigelow): They offer the standard precalculus course to students who don't have the B in PM12 needed for entry into calculus. It is also taken by students to fulfill requirements in other programmes, especially Business. Some students who are looking for easy credit go back to precalculus after taking calculus. The course prepares students well for calculus if they can get a good mark, but many can't handle it. They have a fairly high non-completion rate (as high as 60%). Dave wondered if this is because students aren't doing the work, or if there are other reasons.

VCC (Jean McLeod): Only 1st year courses are available. Since students don't want to pay university fees to take precalculus, students prefer to take the free ABE Math 12 course. As a result they stopped offering a precalculus course.

Yukon (Tim Topper): Their situation is similar to that of Selkirk College. Students who don't have 75% in PM12 usually take the ABE Math 12 course. They also offer a non-university transferable Calculus course for their weaker students. They have found that if students do well in either the ABE precalculus or the non-UT calculus, then they do well in the regular Calculus course.

General discussion followed.

Satoshi Tomoda asked whether it was better for students to take a precalculus course or simply to take calculus twice. Jennifer Hyndman replied that at UNBC they had done a formal study which showed that if students took Calculus twice their letter grades were one level higher the second time, if they passed the course the first time. The difficulty is that many students cannot pass it the first time because they are so weak in algebra. David Feldman observed that students could be overwhelmed by Calculus if they take it before they are ready, and that this may turn them off of mathematics altogether.

Greg Schlitt reminded the committee of the Mathematics Proficiency Report that was prepared by Leo Neufeld, and asked to what extent institutions were considering those proficiencies (in particular the priority placed on general thinking skills and attitudes) in the design of their precalculus courses. Richard DeMerchant noted that this report had been used in the building of the new high school curriculum. He commented that he does not believe that algebra skills are the worst problem for high school graduates who go on to take calculus: as highlighted in the report, students need to develop the ability to deal with multi-step problems and synthesize ideas. He advocated incorporating more problem solving. Malgorzata Dubiel agreed and pointed out that this is consistent with their FAN course. She expects the revisions to Math 100 will also emphasize problem solving skills, algebra and making connections.

Richard DeMerchant challenged the group to think about the purpose of university calculus: Is it just used to weed out kids? There was general agreement that it is used as a filter, but disagreement about how much of a problem this causes. The study of calculus was defended by those who pointed out its applicability to the real world, and the benefits of building one's powers of abstraction. It was noted that many programmes that used calculus as a filter have lowered their mathematics prerequisites due to enrolment pressures. Answers to why we teach calculus should inform what we do in precalculus.

The question was raised about whether high schools are fulfilling their responsibility to prepare students for Calculus. Deanna Baxter commented that previous versions of Math 12 seemed to be more focussed on preparing students for calculus and suggested that the new Precalculus Mathematics course may be a return to that. Richard Atkins asserted that we should not be accepting students into calculus whose skills are too weak. Malgorzata Dubiel pointed out that even students who have the required high school grades on paper still lack the necessary skills, but the shrinking pool of students makes post-secondary institutions reluctant to send students away. The high school curriculum is subject to change, and there are currently no entrance exams in place. Once students are accepted the institutions have a responsibility to support them.

Dave Van Bergeyk objected to any implications that high schools were not preparing students well. He pointed out that even as students go on to second-year courses they have often not completely mastered all of their first-year material, and that the blame for students being underprepared continually gets passed on down the line to earlier instructors and courses. Since this always has, and always will be the case, our focus needs to be on how we can do things better. He commented that A students from PM12 should not have poor algebra skills, and that he is most concerned about cases where students with 95% averages do not succeed in Calculus. High school teachers teach the curriculum they are mandated to teach, which is not perfect but does improve with each iteration. He expressed hope that the new curriculum with its focus on problem solving throughout will allow students to develop better procedural and conceptual understandings of math. Although he hoped A students would be able to succeed in Calculus on the first attempt, he acknowledged that some students may be able to earn Bs through memorisation without true understanding, and that this could cause problems for them later.

Math2. Math for Elementary Education: Report of the Subcommittee—Malgorzata Dubiel

Malgorzata distributed copies of the latest draft of the subcommittee's report. She reminded the members that this subcommittee was struck two years ago in order to study and make recommendations for teaching Math for Elementary Education. At last year's meeting the subcommittee presented a preliminary report which included draft guidelines. They agreed to carry on for another year and bring a more substantial report to this meeting. The current document begins with guiding principles which outline what such a course should try to achieve. Its philosophy is based on current research in mathematics-for-teaching which indicates that people who teach math need a deeper (not necessarily broader) understanding of mathematics than those who use it in their jobs. The document also includes suggested course content, though no core curriculum is mandated. The committee had hoped to make recommendations for textbooks, but no ideal text was found. Instead they compiled a number of surveys of textbooks currently in use, which highlight their pros and cons. A new generation of texts is beginning to appear, but they are not yet good enough. The document concludes with several appendices, including one on Activities which is not yet complete. It will include first-day activities, word problems and geometry activities. The final appendix provides interesting web links, including two reports on Math for Elementary Education in the United States. The textbook analyses contained in one of these reports should be read with caution as the ratings done were based on content alone, and not on quality of the material presented.

The subcommittee agreed that although most institutions only offer one Math for Elementary Education course, it would be much better for students to take two. With only one course, it should have a minimum of 4 contact hours per week. How the course is taught is even more important than the specific content. Lecturing alone is not sufficient. Activities that build an understanding of mathematics-for-teaching are essential.

The work of the subcommittee is nearly complete. The final report will be posted on the BCcupms website.

David Feldman commented on the apparent move away from breadth of knowledge. Malgorzata responded that often we try to cover too much. Sometimes this is due to the textbooks we use. They are written for the US market where often more than one course is available. She advocated wise coverage of the most essential topics: thinking mathematically, problem solving, fundamental number and geometry concepts, including development of a deep conceptual understanding of fractions.

Nicholas Buck commented on the tension between teaching the math and teaching how to teach math. The texts often have a mix of both. Malgorzata noted that the course discussed by the committee is a mathematics content course that is to be distinguished from mathematics methods or pedagogy. She acknowledged that most instructors in mathematics departments are not trained in the pedagogical aspects. At the same time she observed that we teach by example, and when teaching this course we need to be especially thoughtful about the example we set.

STATISTICS SESSION (please see the complete Minutes of the Statistics Session on page 34)

Stats1. Approval of Agenda

Stats2. Approval of Minutes of the Statistics Subcommittee Session at 86th Meeting

Stats3. Matters Arising from the Minutes

Stats4. Institutional Reports

Stats5. Other Business

Stats6. Motion to Adjourn

Plenary Session

6. Reports from Mathematics and Statistics Sessions

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

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

7. Report from the Ministry of Education—Richard DeMerchant

Richard reminded members that the Western and Northern Canadian Protocol (WNCP) Common Curriculum Framework (CCF) for Grade 10 – 12 Mathematics will begin in September 2010 (grade 10) and continue in September 2011 (grade 11) and September 2012 (grade 12) as planned. Implementation for grades K-7 has been completed in many school boards as they have opted to follow the optional implementation timelines. Schools will be required to implement grade 8 next year and 9 the following year. It was noted that the curriculum revision started in 2002 and that while the timelines may seem slow the speed under which development and adoption of the curriculum occurred has been as quick as possible. The curriculum as well as background documents can be found on-line at www.wncp.ca (click on subject areas and then mathematics). Additionally the ministry has created Frequently Asked Questions in relation to Mathematics 10-12 which is available at: http://www.bced.gov.bc.ca/irp/program_delivery/math1012_faq.pdf

AB, BC, MB, PEI, NF, NB, NU, NT, SK and YT will all follow the WNCP CCF. It is unprecedented that 10 jurisdictions with educational autonomy would choose to follow the same curriculum. Opportunities for cross jurisdictional collaboration should be greater than in the past due to the wide scale adoption of the CCF. For the WNCP member jurisdictions this revision has been a chance to take the lessons learned from the initial WNCP development in 1995 and 1996 and refine the curriculum.

Richard emphasised that all three pathways emphasise development of conceptual, in-depth understanding of topics which is in line with the BCcupms report generated 10 years ago. The inclusion of the mathematical process (communication, connections, mental math and estimation, problem-solving, reasoning, technology and visualisation) has been seen as a large change by teachers. It is hoped that the reduction in the number of topics will allow teachers more time to develop concepts in more depth.

Principles of Math, Applications of Math and Essentials of Math will no longer exist once the new courses are implemented. This will result in a change to post secondary admission requirements to align with the new curriculum as the current curriculum will not exist. The primary question on the mind of teachers, counsellors and parents is the level of acceptance of the new courses: Apprenticeship and Workplace Math, Foundations of Mathematics and Pre-calculus Math. This information is essential in counselling students on which course to take.

Richard noted that UBC's requirement for students to take Principles of Mathematics 11 for general admission has resulted in a number of adverse effects in the high school math system. These include: more students taking Principles of Mathematics than was initially intended, low enrolments in Applications of Mathematics and negative attitudes toward mathematics to name a few. Currently the Principles of Mathematics courses account for approximately 70% of students. It was noted that the original enrolment projections for the courses were Applications of Mathematics 50%, Essentials of Mathematics 20% and Principles of Mathematics 30%. Current enrolment for Principles of Mathematics is approximately 70%. As a result, teachers have had to adjust their instruction of the Principles of Mathematics courses to account for the diverse nature of the students in the classroom. It is hoped that the students will be more equally distributed among the new courses.

Richard also noted that links are being created with the BC School Counsellors Provincial Specialist Associations to spread information about the new courses. This work will continue but the counsellors have reiterated that there is a need to know the impact on admissions before they can adequately advise students.

Questions and comments can be directed to Richard. He can be reached at the Education Standards Unit, BC Ministry of Ed, phone 250 – 387 – 4784, or via email at richard.demerchant@gov.bc.ca and indicated he would be pleased to assist in providing any information which would help to determine admission criteria.

Discussion of the report followed.

In response to a query Richard confirmed that the graduation requirements would continue to be a Grade 11 or Grade 12 Mathematics courses and that this would be unlikely to change, especially since it was changed as recently as 2004.

Winona Cordua-von Specht reported that BCIT is happy with the Apprenticeship & Workplace Math courses.

There was some concern that there is no longer a stream for the very weak students. Richard responded that since content has been removed, and with the greater emphasis on conceptual understanding, there should be fewer students coming up

through the system that are really struggling. He suggested that individualised accommodation might be an option for those who are still unable to cope.

There was also discussion of the possibility of students taking courses from more than one pathway. Richard indicated that although it is better if students take the courses in sequence along any pathway, there are no formal prerequisite requirements in the BC system, so students could technically move from one pathway to another if they so choose. Some institutions indicated that they would like students coming in to have both Foundations of Mathematics and Pre-Calculus Mathematics.

It was observed that if the Pre-Calculus Mathematics stream is accepted by ALL programmes it will still be the pathway of choice for those who want to keep their career options open. Richard indicated that institutions and programme areas should feel free to narrow things down and indicate a preference for Foundations of Mathematics or Apprenticeship & Workplace Mathematics where it makes sense to do so.

Clint Lee indicated that Okanagan College has begun to look at its admission requirements. Some technology programmes will require Foundations of Math 12 with 80% or better, or Pre-Calculus 11. Computer Information Systems will accept Foundations of Math.

Gary McGillivray reported that UVIC has done their review. As far as their own courses go, Calculus requires the Pre-Calculus 12, but the other mathematics courses do not. Other departments were asked to check their own requirements. They consulted with Math, but have not done anything yet.

Wayne Nagata indicated that the Mathematics Department at UBC has recommended that Foundations of Math 12 be accepted for some programmes, but this has not yet been approved.

Jennifer Hyndman stated that at UNBC they are leaning towards recommending acceptance of Foundations of Math 12 for entry, but this will still need to be discussed by individual programme areas.

At SFU decisions on the entry requirements will ultimately be made by Senate.

There was concern that post-secondary institutions may need to put something in place for students who choose the wrong pathway in high school and need to cross-over. UVic is putting in a continuing studies course that will review Grade 6 to Grade 11 mathematics, and it already has a precalculus course that fits with the grade 12 course.

Richard reported that the feedback he has been getting so far has been good, and encouraged members to work with their institutions to help facilitate this transition.

The Tuesday Session of the BCcupms adjourned at 4:05 p.m.

BCcupms and Secondary School Teachers Session

1. Introductions and Opening Remarks

We welcomed Brad Epp from the Kamloops School District to our Secondary School Teachers Session.

2. Reports

2.1 BCAMT – Dave Van Bergeyk

Dave reported that teachers are continuing to wrestle with the implementation of the new curriculum. K - 8 is already in place. Implementation involves more than just adjusting to new topics—it involves a shift in teaching practices to promote improved problem solving abilities and general math skills. Teachers need to know how the new courses will be accepted for students going on to universities and into the workplace.

David Leeming asked if back issues of Vector are available on the web. Dave advised that anyone interested should contact the executive for access to any back issues. Discussions are currently underway to explore the possibility of converting Vector into an e-journal. The new editor, Peter Liljedahl (SFU), who is the current University Representative on the BCAMT, is moving to introduce a peer-reviewed portion into the journal.

The issue of final exams is still a contentious one. Concerns were expressed with regard to the optional status of the Grade 12 Exam and how it is affecting admission to post-secondary institutions. An email from Wayne Matthews to the list-serve suggested that the quality of students is going down. David Feldman noted that it was convenient to have a standard given the inconsistency of grades (even at the university level). Wayne Nagata indicated that at UBC, students are admitted with 80% in PM12 without the exam, or 73% on the PM12 provincial final. For the Grade 10 Exam there was concern that the exam is entirely machine-scored, leaving some wondering whether it could assess students problem-solving ability. Deanna Baxter commented that the Grade 10 exams were a non-issue for Capilano, as they would not look at Grade 10 grades. Richard confirmed that there was currently no plan to eliminate the provincial exams entirely. They are still useful for scholarships, though running the exams is expensive.

John Grant McLoughlin related that although New Brunswick no longer has provincial final exams, at the University of New Brunswick Warren Tingley has led an initiative to develop an exam that the university and others will consider if students want to write it. The creation of this exam has been a collaboration between high school and university teachers.

2.2. BC Secondary Schools Mathematics Contest – Clint Lee (see attached report, page 32)

2.3 BC Universities' Calculus Challenge Exam – Malgorzata Dubiel

A detailed report of the BC Universities' Calculus Challenge Exam can be found at www.math.sfu.ca by clicking on Outreach and then selecting the Calculus Challenge Exam. It is also accessible from UBC's Mathematics Department website. Last year's exam was at SFU, while this year it is at UBC at the beginning of June. Numbers of students writing the exam seem to be going down.

Brad Epp commented that the date of the exam causes difficulties for semester schools. They are not able to finish the course and have time to work with students before they need to write the exam. He asked if the dates could be changed. As there is no connection between the current dates and the universities' courses, there is no reason a change cannot be made provided that the new date will not interfere with AP and IB exams. Malgorzata and Wayne Nagata encouraged Brad to send an email to both universities with his request.

CNC and UBC(O) both offer challenge exams for calculus, and one was recently approved at VCC. Several other institutions indicated that they offer challenge exams, including Kwantlen, which has one but it has never been written. Informal placement is available for any course, but it is useful to have challenge exams, especially for people without proper documentation. Wesley Snider asked whether the universities were accepting transfer credit from courses challenged at the colleges. The response was that since Prior Learning Assessment Credit of any kind isn't recorded as such on a transcript, receiving institutions would have no way of knowing the course credit was through a challenge process.

At UNBC almost any course can be challenged. Students pay 50% of the course fee, write the final exam, and if successful get the course credit and grade with no special annotation. Students may not challenge a course that has been previously taken. At SFU students can sign up for a course challenge if they have departmental permission. Credit is awarded only on a Pass/Fail basis, with students obtaining a CC designation. Simply passing an exam is not the same as experiencing a course, so students could use the challenge to satisfy prerequisites, but would not get credit in the same way.

3. General Discussion

3.1 Admission Standards—Wesley Snider

This topic was discussed under Richard's report.

4. Adjourn to Reception. The session adjourned at 5:10 p.m.

WEDNESDAY, MAY 13, 2009

Plenary Session

1. OPENING REMARKS

1.1 Introduction of representatives

1.2 Attendance lists
Nora circulated the attendance lists.

1.3 Announcements from the host
Fae DeBeck reminded the members of the first Sharing Math plenary talk at 4:30 p.m., and offered to help arrange car-pooling for the Greek dinner in the evening.

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

2. CORRESPONDENCE

Item 5.5 BCCAT: Backlog of Articulation Requests was added to the agenda for discussion of a letter received by Jim Bailey and Bruce Dunham from BCCAT.

3. REPORTS

3.1. BCCAT— No representative attended the meeting.

3.2. PIMS—David Leeming, PIMS Education Associates Coordinator and Managing Editor of Pi in the Sky

PIMS Education Associates

In order to allow Colleges and SPTUs in BC and Alberta to engage in an affiliation with PIMS*, the PIMS Education Associates program was created in 2008. The affiliation is for a term of three years, and is renewable. Associate members pay an annual fee, currently $500, which they may draw to support math education outreach in their communities. Examples of funded activities include a guest speaker for a public lecture on the Hadron Collider, support for the Kangaroo mathematics competition (grades 4 and 5) and the purchase of mathematics demo materials for use in College and secondary school mathematics classrooms.

Four Alberta Colleges are now PIMS Education Associates. In British Columbia, Camosun College, Langara College, Okanagan College, Thompson Rivers University, University of the Fraser Valley and Vancouver Island University are all now PIMS Education Associates. We are expecting more BC Colleges and SPTUs to sign on to this excellent initiative.

(*Pacific Institute for the Mathematical Sciences)

PI in the Sky

The last Issue of Pi in the Sky (Issue #12) came out in Fall 2008. Copies were made available at the Meetings. An effort will be made to accept articles and book reviews targeted to mathematically talented secondary school and College level students. PI in the Sky has moved its Editorial Offices to the University of Victoria. Issue #13 should be available in August 2009.

The magazine now has over 1200 subscribers in 56 countries. Pi in the Sky is also available on line by accessing the PIMS website www.pims.math.ca.

3.3. ABE—Jean McLeod

Adult Basic Education Mathematics Working Committee Annual Articulation Meeting;
Vancouver Community College, March 5-6, 2009 prepared by Costa Karavas

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

1. Ministry (AVED) Update – Shelley Gilmour

BCCAT report that looks at the profiles of adult students in both the K-12 and postsecondary systems. Some key findings that highlight differences between ABE students in the secondary and post-secondary systems are summarized below.

- The level of prior academic achievement for ABE students tends to be lower for those in the secondary system than for those in the post-secondary system.
- Eighteen year-olds in the two educational systems have very different profiles with respect to past academic achievement.
- ABE students in the secondary system tend to wait a shorter period of time between last being enrolled as a non-adult and first enrolling in ABE.
- Credential data provide evidence that ABE students are more likely to be using the post-secondary system to upgrade in specific subject areas and the secondary system to achieve a high school credential.
- Post-secondary ABE students are more likely than secondary students to have already earned a high school diploma before first enrolling in ABE.
- ABE students are recognizing and taking advantage of the "seamless" opportunities provided by the BC education system to upgrade while studying at the post-secondary level.
- In the post-secondary system, ABE students are more likely to earn a post-secondary credential than a high school credential.
- For many students, ABE is a short experience, lasting not more than one year.
- Students tend to take ABE on a part-time basis.
- Those studying ABE in the post-secondary system transition to post-secondary studies at higher rates.
- The relative emphasis on post-secondary studies increases substantially over time for those in the post-secondary system.
- The relative concentration of the Early Entry Cohort in more rural areas of the province may reflect the tendency for local secondary schools and colleges to cooperate in those areas to ensure that students are able to meet their educational needs.

Funding support of $1.6 million for 16 full time Regional Literacy Coordinators attached to institutions in the college system to work with regional education partners for a coordinated approach and delivery of adult literacy services that meet unique community needs.

Increased funding for the ABESAP (another $3 million in grants over the next three years) for developmental program students who need help to pay for books, supplies, and sometimes transportation and unsubsidized child care while attending a post-secondary institution.

2. Discussion on new proposed math streams (grade 10 to 12).
A general discussion followed on the new high school curriculum. A subcommittee was struck to compare the learning outcomes of the new high school curriculum with the ABE math learning outcomes.

3. Assessments
Accuplacer seems to be used by many institutions, however, many institutions still use paper and pencil assessment tests.

4. Presentation by Pearson Canada

MyMathLab software was demonstrated.

5. **Articulation of new math courses**
   - North Island College Math 054 (Advanced Business/Technical Mathematics)
   - College of New Caledonia Math 042 (Trades Math 12)

3.4. AMATYC—No report.

3.5. Changing the Culture—Malgorzata Dubiel

The 12th Annual Changing the Culture Conference was held at SFU Harbour Centre on Thursday, April 30. This year the one-day PIMS conference was combined with the 2009 Canadian Mathematics Education Forum, which began on the evening of the 30th. There were fewer participants than usual (approximately 100). This may have been due to holding the conference on a Thursday as opposed to the usual Friday. Keynote speakers included Rick Brewster (from Thompson Rivers University) and Rina Zazkis (from Simon Fraser University Education). Next year the conference will be held on the Friday once again. Malgorzata was concerned about timing because semesters will be shifted due to the Olympics. It was suggested that the conference does not need to be held in Vancouver if someone else is willing to take on its organisation.

3.6. Math Challengers (formerly Math Counts)—Leo Neufeld

Math Challengers (MC) is the made-in-Canada version of Mathcounts, a mathematics competition for Grade 8 and 9 students initiated by Engineering societies. The main purpose of this one-day event is to encourage and interest kids in mathematics and science by providing an opportunity for them to experience math with others in an environment of celebration and fun. The initiative is now a co-operative venture of engineering societies and mathematics people.

The event consists of: 2 rounds of written problem solving, a round where teams of 5 students work co-operatively and a final, elimination round, called Face-Off, where the top students compete against one another in an audience setting. The day (or afternoon) is punctuated with refreshment breaks, short show-and-tell sessions by math or engineering people and, of course, the wrap-up session. Trophies, medals and certificates are generously awarded to individuals and teams. Kids love it!

Volunteers to assist in marking, supervising, etc. are easily found. Some organisational work in recruitment, site prep, etc. is necessary. Presently, MC is offered only on the Lower Mainland (LM) and in Victoria (VI). In a recent Regional competition, there were 49 Grade 8 teams (LM and VI) and 53 Grade 9 teams. Having teams from elsewhere in the Province being welcomed to the MC Provincial competition would broaden the experience for everyone and introduce many more students to this rewarding experience.

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

3.7. CMEF—Malgorzata Dubiel

The first Canadian Mathematics Education Forum was the inspiration of Katherine Heinrich and was held in Quebec City in 1995. 100 people, representing a wide variety of stakeholders from across Canada came together to discuss mathematics education in Canada. Discussions at this conference led to the first Changing the Culture Conference. Jonathan Borwein brought the Forum back in 2003 (Montreal), and in 2005 it was held again in Toronto. It was decided that it should become a continuing event which occurs every 4 years. About 180 people attended the 2009 Forum, held at SFU's Harbour Centre, April 30 – May 3. Representation from BC was the strongest but participants came from across the country, including one student and one parent. Thirteen working groups were selected from applications that were received a year before the conference. Participants at the Forum were able to hear about and contribute to the work being done by these groups. A major goal was to allow people to connect with others from across the country with common interests. Reports of Working Groups will be available on the forum website: http://www.math.ca/Events/CMEF2009/index. The next CMEF is tentatively set to be held in Ottawa in 2012 (timed to fall between ICME conferences), provided Ottawa agrees to host and the CMS and PIMS continue their support.

4. BUSINESS ARISING FROM THE MINUTES OF THE 86th MEETING

4.1 On-line Systems—Jim Bailey

Jim opened the discussion by asking if any members or their institutions have been using any of the on-line homework/support systems that were described by the publishers' representatives at last years' meeting.

Instructors at Capilano (Deanna Baxter) have tried WebAssign (Wiley) in their precalculus and calculus courses, and MyMathLab (Pearson) in their Business Calculus course. This was motivated in part by a change in their course format from two 2-hour meetings weekly to two 1.5-hour meetings plus one "equivalent" content hour. Instructors can choose to schedule non-mandatory tutorials, meet with students in their offices, or assign on-line work. Some used the on-line homework as all or part of this 1-hour equivalent. There was muted response to the on-line systems. Students generally seemed to like MyMathLab, especially not having to write out their homework assignments. Some instructors assigned half of the homework on MyMathLab, but also recommended that students do hand-done questions. Hand-done homework is not usually collected or marked. Although there was good participation in the on-line homework, which was worth 5% of their grade, there did not seem to be any difference in students' success. When packaged with the text, MyMathLab costs an extra $5 or $6, but when students purchase used books they must buy it separately, in a version that includes an e-text, for about $60. WebAssign is cheaper. Deanna indicated that she felt the costs were too high and that students would be better served with tutorials or solutions/questions assigned by instructors. She will not be using it again, especially if other instructors who teach the same courses also opt not to.

At Northwest College, Mona Izumi has used WebAssign for Calculus. She assigns a combination of traditional and on-line homework. She found that they were doing the on-line homework but not the other work! The on-line questions are randomised, so she found that when students worked together on it they actually did more. Cost is an issue. The access code is only good for one semester, so students had to pay an additional $25 for the Calculus II course and an additional $15 for Physics. She would use the on-line homework again, but would prefer it if the access codes would be good for more than one term.

Jason Diemer from North Island College reported that he has used MyMathLab for distance versions of some of their courses. Students seem to like the video lectures and generally he has had positive feedback. Initially the on-line help wasn't extensive enough, it was too elementary, and the free-form response was clunky. There were issues with the syntax. All evaluated homework for the courses was still pencil and paper.

At Fraser Valley University (Greg Schlitt), instructors have been using WebAssign for 2 or 3 years in Precalculus and Calculus I as policy. The experiment has been largely successful. They find that students do more homework. Formerly homework was always assigned, but never marked. The on-line homework is worth 10% of the course grade. There is lots of collaboration, but this is normal. Questions are randomised, but the randomisation isn't extensive. Even when students are working together, they are still processing. They have observed some increase in students' grades, especially the first year they tried it. No mathematics writing is being assessed. Though some instructors do assign Technical Reports (writing assignments), they are not doing these once per week anymore. The issue of codes and text packaging is a problem. Calculus I and Calculus II together costs $20 bundled with the text. But there is still a problem for those who come in in the second semester or buy used books. The standalone cost for the access code is $30, which is difficult for some. They are still trying to sort this out. Another concern is that the system makes use of some non-standard math notation, in particular powers of trig functions. Nevertheless, they will continue as it has been good on the whole.

Malgorzata Dubiel reported that at SFU they have been expanding their use of LON-CAPA. They initially started using it for their Business Calculus I course, but have now also started to use it in their Science Calculus I and Math for Elementary Teachers courses. They plan to extend it to their Precalculus and FAN X99 courses as well. She reminded the committee that the system is free. The only challenge is building up and maintaining your own problem sets. She indicated that those involved with it at SFU would be happy to help anyone who would like to start using this system. The biggest benefit for the Math for Elementary Teachers course has been that discussion postings appear right underneath each question. Students can pose questions or make comments that are answered by other students. TAs monitor the discussion, and students receive bonus points for active participation in discussions. They will definitely continue using this system.

Satoshi Tomoda recommended that members take a look at a system called WeBWorK which comes out of the University of Rochester and is supported by the Mathematics Association of America. It is quite well used in the US and Europe, and

contains a lot of free calculus materials. A trial version is available. More information can be found at: http://webwork.math.rochester.edu/

George Ballinger mentioned that MathXL may be a cheaper option than MyMathLab, as it doesn't have the e-text attached.

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

Jim presented the lists he had put together of all "equivalent" courses to Calculus I and Calculus II at the major universities. He met with Finola Finlay about this and was informed that this could be incorporated into the Transfer Guide as a special transfer agreement on the BCCAT website. Students would be able to see it, and Registrar's Offices would not have to duplicate work. Jim asked the committee whether we would like to proceed with this.

There was some discussion about whether all institutions were following the Calculus Core Curriculum. Some institutions are providing an early introduction to integration in Calculus I, while others are not.

There was also some confusion about how this differs from current articulation processes. It was clarified that normally sending institutions request transfer credit from receiving institutions through their Registrar's Offices in a process that is facilitated by BCCAT. This situation is unusual as it represents an agreement among sending institutions. If it is approved it will be sent to BCCAT who would then contact the Registrars to let them know about the special agreement. There was some question about whether the new SPT Universities are automatically receiving institutions, but this is not the case. Institutions must apply for, and meet certain requirements, before they become receiving institutions.

Michael Nyenhuis indicated that Kwantlen would like to be included on the list. This sparked discussion of including the receiving institutions in the list. Some were prepared to add their institutions to the list right away, while others felt they would need some time to consider the consequences of this more carefully. In the end it was decided to leave the list as it is for the time being. Institutions who feel they belong on the list, but are not yet included, can request to be added in subsequent years. This special agreement will need to be revisited regularly in order to ensure it stays current.

Motion: (moved by Jennifer Hyndman and seconded by Jean McLeod)

That the members of the BCcupms agree

that the following are equivalent first year core Calculus I---science stream courses and that the respective institutions will give transfer credit to students who are transferring between them:

ALEX 151, BCIT 1100, CAMO 100, CAPU 116, CNC 101, COLU 113, COQU 101, COTR 103, DOUG 1120, LANG 1171, NIC 181, NLC 101, NWCC 101, OC 112, SELK 100, VCC 1100, and YUKO 100;

and

that the following are equivalent first year core Calculus II---science stream courses and that the respective institutions will give transfer credit to students who are transferring between them:

ALEX 152, BCIT 2100, CAMO 101, CAPU 126, CNC 102, COLU 114, COQU 102, COTR 104, DOUG 1220, LANG 1271, NIC 182, NLC 102, NWCC 102, OC 122, SELK 101, VCC 1200, YUKO 101.

Carried unanimously.

Action: Jim Bailey will inform BCCAT of the motion.

Action: Institutions who wish to be added or crossed off the list should contact Jim by end of August.

4.3 Money for the Web Site

The Mathematics Department at the University of the Fraser Valley has agreed to fund the website. It costs approximately $35 per year for domain name. Thanks to UFV!

5. NEW BUSINESS

5.1 Has anything changed in the new SPT Universities?—Jim Bailey

Jim opened discussion by asking what, if anything, has changed since the designation of the new Special Purpose Teaching Universities.

Dave Bigelow described the situation at Vancouver Island University. He noted that there has been a philosophical shift in thinking which may not match with reality. Some areas are discussing offering Master's Degrees, but it is uncertain whether or not they will go down that road. Expanded offerings are being discussed in mathematics, including discussions about offering a Math Minor for future high school teachers. Some are suggesting that this should be a Major. There may be some expansion within the next 3 – 5 years. There has been an increase in marketing to international students. It is hoped that the institution will be more attractive now that it no longer has the confusing "university-college" designation. It is unclear whether students or new hires will get what they think they will get when signing on to a "university". There have been many threats of layoffs, but their administration has resisted cutting degree programs. There is much discussion over what instructors should be called: "employees" is being used, though they used to be "faculty". There is no tenure system in place.

Deanna Baxter reported that at Capilano University there have been no changes in the Math department. They are still called "Instructors". There have been administrative and organisational changes. A Senate has been established, and new divisions have been created as parts of Faculties. Mathematics now falls under the Division of Pure & Applied Sciences in the Faculty of Arts & Sciences. There has been more talk about degree programmes, but they do not anticipate developing a Math major or an Actuarial Science Degree. However Math courses may need to be developed to support other new degree initiatives.

At Kwantlen Polytechnic University, Mike Nyenhuis noted that new Bachelor's Degrees have been developed in other departments; however he has noticed a trend to eliminate mathematics requirements. There is uncertainty about what this will mean in the long term.

Greg Schlitt reported that at Fraser Valley University they have had a mathematics major in place for 8 – 10 years. There has been some discussion of developing Master's Degrees in Sciences, but not in Mathematics. He sees the change as being motivated by name branding issues, in particular confusion over the former designation of "university-college", especially overseas. Since the change in name, FVU has experienced increased enrolments. Applications are up by 30%. They are now perceived as a receiving institution and students are more likely to stay. Issues of research and faculty ranking are still being discussed.

5.2 Transfer of Courses Without Texts—Larry Weldon

Larry has been advocating project- and case study-based courses that do not necessarily require a textbook, especially when good materials are being used by an experienced instructor. He expressed concerns that such courses may present a problem when transfer is requested since there is often not a detailed list of topics.

SFU has a few such courses, namely STAT 100, 300 and 400. STAT 100 provides students with examples that show the kinds of tools that are available to extract information from data. STAT 300 focuses on helping students develop the skills to put into words what they discover through statistics. STAT 400 is more advanced: students are given situations that often include bad or nonstandard data, and learn what can be done to extract information from that data. These courses are at least as effective as the more traditional courses. Larry noted that STAT 100 and the traditional STAT 101, and STAT 200 and the traditional STAT 201, are equivalent at SFU as prerequisites for higher level Statistics courses.

It was observed that this same issue might arise in negotiating transfer for problem-solving or modelling courses.

Larry recommended that transfer credit for these courses should be evaluated by looking at the course materials. Course developers could provide a portfolio for the course.

Mike Nyenhuis observed that the text alone doesn't provide a measure for what is covered in a course, and asked whether institutions were using learning outcomes. He suggested that even for courses with non-traditional delivery modes, course designers could come up with a list of objectives. Larry noted that often these types of courses actually cover even more than is done with traditional delivery.

5.3 Mathematics Courses for Business

Jennifer Hyndman began the discussion by describing UNBC's dissatisfaction with their mathematics courses for business students, including Finite Math and Business Calculus. They find that the students in these courses appear not to value them—the students are disruptive and there are frequent problems. She asked if anyone was using a case study approach?

David Feldman responded that at Selkirk they had experienced the same problems and as a result (and in line with a request from the Business Department) they are no longer using a finite math course model for their business students. They created a course that is more specifically tailored to math for business, with a greater focus on the financial component and graphing, and less on matrices (which they do not seem to need). They follow this up with an ordinary Statistics course for Arts students that has a grade 11 prerequisite.

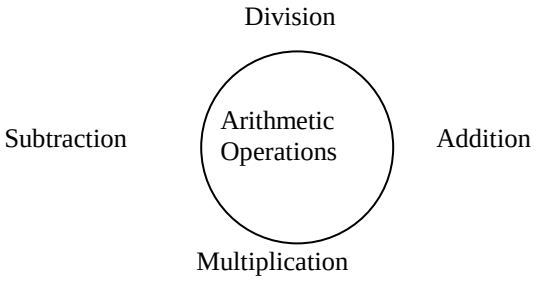
Gary MacGillivray commented that Business perceives itself as a quantitative programme and requires math, and yet students don't see how the math is relevant to what they are doing. The question was raised as to why Business requires certain topics. Jennifer Hyndman observed that many students leave their mathematics to their last year when it is too late for them to benefit from it in their other Business courses. It would be helpful if Business programmes required specific math courses to be completed at appropriate points in the student's degree programme.

5.4 First Nations Initiatives: UBCO MATH 126: Precalculus from an Aboriginal Perspective—Qiduan Yang

Qiduan described the new Math 126 course developed at UBCO which teaches precalculus from an Aboriginal perspective. The following are the Rationale and Summary of Course Objectives provided by Qiduan.

Rationale:
This math course will be developing math concepts from perspectives common to many Aboriginal traditions. First, in general, we will use a perspective of change which is considered to be constant and imperative. Change will be an objective of this course in terms of students' math skill development. The perspective of change taken will include two associated processes in balance: the coming apart of things … analysis, and the coming together of things … synthesis. Second, we will use a perspective of balance associated with the inter-relationship between course elements.

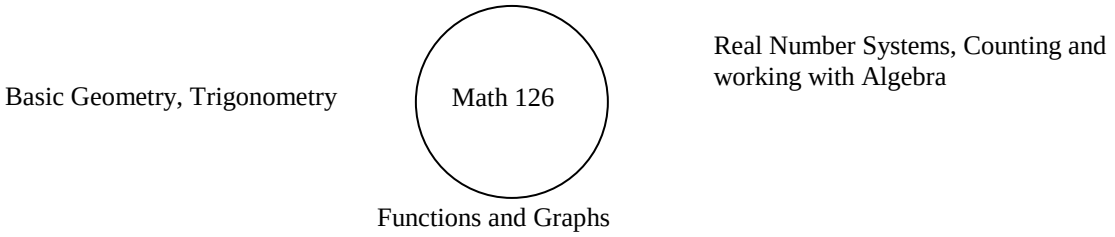
An illustration of the perspective of balance can be the web of inter-relationship between the four basic operations of math:



Analysis of these operations will illustrate relationships between each operation and all other operations. Analysis in this fashion will provide an opportunity for students to synthesise new understandings of many math concepts such as identity, association, order of operations etc. It may be shown that the relationships that define these four operations support almost all subsequent mathematics processes and that understanding math relies on understanding these inter-relationships.

In addition, this perspective of balance may be extended to examine the relationship between many other math processes, as will be the case in this course.

Exponential and Logarithmic
Functions



Again, analysis of each of these topics and illustration of interrelationships between processes will provide students an opportunity to synthesise new and comprehensive understandings of many math concepts and processes.

Summary of Course Objectives:
This course will employ a learning model based on perspectives common to many Aboriginal traditions. In general, the course will focus on balance and interrelationships between elements and sections of the course. The primary focus of development, beyond mathematical concepts, will be on both analysis and synthesis skills. Analysis will be used to disassemble mathematics concepts into elementary components and investigate relationships between components. Synthesis will be used to reassemble mathematical concepts based on interrelationships. This cyclical application of analysis and synthesis is a crucial element in many Aboriginal traditions and these processes, used in this fashion, can create an effective mathematics teaching model.

The model will be applied in this course beginning with the broadest mathematics concepts. As the course progresses, learners will be required to apply their knowledge and skills to subsequent topics always within the context of previously studied concepts.

An example of the breakdown for one of the four main topics would be:

1. Real Number Systems and Algebra
    a. Basic Arithmetic Rules
        i. Operations
        ii. Properties
        iii. Identities
        iv. Order of Operations
    b. Real Numbers
        i. Integers and Rational Numbers
        ii. Irrational Numbers
        iii. The Real Number Line
        iv. Inequalities
    c. Working with Algebra
        4 topics
    d. Binomial Expansion
        4 topics
2. Functions and Graphs
3. Basic Geometry and Trigonometry
4. Exponential and Logarithmic Functions

This course will adopt an instructional model to present introductory university level mathematics concepts. Students will achieve mathematical knowledge and process learning equivalent to other introductory mathematics courses and be capable of functioning at a satisfactory level in subsequent study requiring university level mathematics skill.

General discussion followed Qiduan's description.

In response to a question about other courses in the province designed with an Aboriginal perspective, Jason Diemer replied that at North Island College they offer Math 162/163 which is a pair of courses equivalent to the Math for Elementary Teachers courses (190/191) which are designed for Aboriginal educators.

There was also much interest in understanding how these courses were different from the traditional offerings. It was suggested that we have a speaker come to a future BCcupms meeting (perhaps when it is held at Okanagan College in 2011) to address this.

David Feldman mentioned that there was a talk at the Changing the Culture Conference this year that addressed trying to improve Aboriginal students retention rates in mathematics. Malgorzata Dubiel added that information about this talk will be available on the conference website.

5.5 BCCAT: Backlog of Articulation Requests—Jim Bailey and Bruce Dunham

Jim described a letter that he and Bruce had received listing a large number (3.5 pages) of articulation requests whose decisions are still pending. The requests are grouped according to when they were originally submitted, starting from 2 – 6 months, to 6 – 12 months, to over one year ago. BCCAT is proposing to archive any requests that have been inactive for a year or more. In the letter there was no indication that sending institutions will be notified when their requests have expired, yet it will be the responsibility of sending institutions to resend their requests in order to reactivate them.

ACTION: Jim Bailey offered to put the list of outstanding transfer requests and the list of contacts at the receiving institutions up on the BCcupms website.

There was discussion about whether BCCAT should contact institutions to let them know when requests are about to be archived. It was agreed that this would be very helpful, especially since requests might get lost and it is easy for sending institutions to lose track of requests sent out.

Motion: (moved by Al Fukushima and seconded by Gary McGillivray)

That the BCcupms requests that BCCAT contact both receiving and sending institutions after 6 months to remind them that an articulation agreement is pending, giving them notice of the archiving deadline, and also contact sending institutions before stale requests are archived.

Carried unanimously.

ACTION: Bruce Dunham and Jim Bailey will discuss this motion with BCCAT at the Chairs Meeting in October.

5.6 Report from the nominating committee

Leo Neufeld announced that the nominating committee had determined that Nora Franzova and Susan Oesterle were willing to continue in their roles as Vice Chair and Secretary, respectively. There being no further nominations, Nora Franzova was acclaimed as Vice Chair and Susan Oesterle was acclaimed as Secretary for a two-year term.

6. INSTITUTIONAL REPORTS

ALEXANDER – Len Berggren

Alexander College is a private educational institute located in Metrotown in Vancouver whose mission is to aid students who are new to Canada (and, often, the English language) to integrate into Canadian society by teaching English, vocational programs, and the first two years of university. The college is serious about its commitment to students and their parents and requires regular attendance in its classes.

Its Associate of Arts degree is offered under the written consent of the Minister of Advanced Education. It enrolled its first cohort in Sept. 2007 and will enroll its third cohort in Sept. 2009. In its second year of operation the program had 19 full-time students and 110 part-time students, and it appears the numbers for this Fall will be higher. In its most recent assessment, published this March, the DQAB the Ministry said that no changes in this program were necessary at this time.

Alexander College is a participant in the BC Transfer System, and all its mathematics courses are fully articulated with the corresponding courses at UBC, UVic, UNBC and most other post-secondary institutions in the province that offer academic programs.

Of the sixty academic credits required in its two-year Associate of Arts program 3 are to be 'in Mathematics, Computing Science or Statistics.'

The college has just hired its first full-time Mathematics instructor, Dr. Nessim Tariq, and all of its math courses have been taught by persons with a Ph.D. Its Math program offers:

MATH 100 (3) Precalculus: Prerequisite: BC Principles of Mathematics 11 (or equivalent) and permission of the Dean.

MATH 104 (3) Differential Calculus with Applications to Commerce and Social Sciences: Prerequisite: BC principles of mathematics 12 (or equivalent) with a grade of at least B, or MATH 100 with a grade of at least C .

MATH 105 (3) Integral Calculus with Applications to Commerce and Social Sciences: Prerequisite: MATH 104.

Recent practice, based on student demand, has been to offer only precalculus and the above two calculus courses. Total enrollment for both calculus courses, in each of the terms beginning in Jan. and May of this year, has been about 75 students. We also have on the books two 'mainline' calculus courses:

MATH 151 (3) Calculus I: Prerequisite: BC principles of mathematics 12 (or equivalent) with a grade of at least B, or MATH 100 with at least a C.

MATH 152 (3) Calculus II: Prerequisite: MATH 151

And, although it has never been taught we would offer, if there were student demand we could offer:

MATH 232 (3) Elementary Linear Algebra: Prerequisite: MATH 151.

Despite difficult economic times, enrolments at Alexander College are growing and the College looks forward to its continuing participation in the post-secondary mathematics education community in British Columbia.

BCIT – Winona Cordua-von Specht

- Colin has retired and I am replacing him as BCcupms rep for BCIT.
- BCIT is a bit concerned over the new math streams particularly that students may be scared from taking the Pre-Calculus stream due to the name and most of our technology programs require the Pre-Calc Math.
- BCIT is very happy with the Apprenticeship and Workplace math option.
- BCIT now can apply for NSERC grants and one of our math instructors has successfully received a grant.

CAMOSUN – George Ballinger (for Wayne Matthews)

1. Budget cuts of 3% across the college resulted in not immediately rehiring of a continuing position and settling with a term filling at least for now. Also we've sacrificed the running of MATH 230, Modern Algebra, again at least for now, perhaps switching to an alternate year basis.
2. Second year math enrolment numbers have been in decline in part due to the cancellation of second year physics and computer science courses.
3. The MATH 100, Calculus 1, section delivered at Claremont Secondary school in the fall, has now had two go-throughs. Half the students will likely take the credit and go into Calc 2. Even though only two students failed, the others will probably treat the course more as a pre-calc course. Students seem to appreciate the rigour and the extent to which it fills the holes in the Math 12 curriculum.
4. At the Interurban Campus, the technology courses are preparing to be run over 4-month semesters rather than the current 3-month quarters. Many of these students and others from other tech colleges take our bridging programs to 3rd year engineering. These programs will run, starting in 2010, 8 months instead of 6. So the winter bridge starting in January will overlap with the summer bridge, which will now start in May. The math courses in the bridge, many of which have transfer agreements across the province, have been changed so that the courses in the civil bridge in winter are the same as those for the mechanical bridge in summer.
5. The mathematics department has been charged with analyzing the new High School curriculum and making recommendations to the rest of the college that have math pre-requisites for their programs.
6. Liz Ashton, the current President of Camosun College, is retiring. Her replacement has been chosen but the announcement of who the new President will be won't take place until later in May. Randy Genereux, from Mount Royal College in Calgary, became our new Dean of Arts & Science on September 1, 2008.

CAPILANO – Deanna Baxter

No upcoming or recent course changes to report. Enrolment university-wide increased slightly in the past year and did not change in the math courses.

Transition from college to university: no changes are planned in the Mathematics and Statistics Department. In accordance with the University Act, a senate and faculties are being created. The Mathematics and Statistics Department will be in the Faculty of Arts and Sciences.

Course format changes: Starting in Fall 2008, most of our courses were changed from 4 lecture hours per week to 3 lecture hours per week plus a one hour per week equivalent which could be delivered in a variety of ways such as a tutorial, an online component, meetings with students individually or in groups etc. Several instructors tried out some of the online homework systems (which were demonstrated last year during the PD session) as part of the one hour equivalent with mixed results. Student success did not seem to increase and coupled with the added cost to students, no one is currently planning to use an online homework system in the upcoming year.

Regarding the question from BCcupms 2008 about provincial examinations, the current requirements as of Fall 2008 are: BC Secondary School students applying to Capilano University will not require optional provincial exam results for admission to the University. For those students who choose to write an optional examination, Capilano University will consider the higher of the school mark or the blended school and exam mark for admission purposes.

Christopher Morgan has been on a Paid Educational Leave this year developing an online Multivariable Calculus course.

Ken Towson and Reimar Hauschildt are in the final stages of writing an introductory statistics textbook with a focus on sports related data. A preliminary version of the book was used in one section of Math 101 (Introduction to Statistics) in the Fall 2008 and Spring 2009 semesters.

Reimar Hauschildt is retiring in August 2009. Due to decrease of sections over the past few years, no new hires are planned for the immediate future.

COLLEGE OF THE ROCKIES – Jim Bailey

This year a number of programs were cut at College of the Rockies and course offerings in second year University Transfer were reduced. This has not affected Mathematics because, for several years, any second year course for which there is not sufficient enrolment I have been teaching as directed studies (with no workload considerations.) In addition, our physicist (Richard Hewko) has decided to retire so we will no longer be offering the Combined Math-Physics. I have taken on four of his courses (Physics 1 and 2, Astronomy, and Computer Programming). To cope with the increased workload I will be offering some related courses (for example, Calc 4 and ODEs) in the same time slot, using a tutorial rather than a lecture model.

COLUMBIA – No representative was sent to this meeting.

COQUITLAM – Gera Belchev

Nothing to report.

DOUGLAS – Wesley Snider

The latest budget has not brought any new cuts to our department and we have managed to keep probationary and post-probationary faculty employed with other faculty taking a variety of leaves.

We piloted our on-line statistics course for Psychiatric Nursing students (Winter 2009). 16 students started the course, 12 finished, one failed. Preliminary reports suggest that students found it difficult to take a mathematics course on-line. A more formal follow-up is in the works.

We have completed a feasibility study for a Post-degree Diploma in Mathematics and Science Teaching. Bruce Kadonoff has received release time to do the first stage of programme development over the next year.

Douglas College has signed a Memorandum of Understanding with Simon Fraser University to proceed, on a pilot basis, with a dual admission cohort of up to 75 Humanities and Social Sciences students. This agreement will allow students to be admitted simultaneously to both institutions by completing a single application. The co-admitted students in the pilot

cohort will be able to study concurrently at Douglas and SFU. If successful, the programme could be extended to Science students.

We are in the process of developing a new course for Animal Health Technology students which will focus on the mathematics skills necessary for work in this field.

Our new computer-based assessment test is now up and running. Maplesoft was abandoned due to technical problems and replaced with Accuplacer though the test is comprised of our in-house generated questions.

We have started a Math Club at the David Lam campus for senior and junior secondary students interested in math contest questions. The students meet once a month after school.

The Dean of Science and Technology and the Vice-President of Education have both resigned, and the College President and Registrar have both retired.

FRASER VALLEY – Greg Schlitt

KWANTLEN – Michael Nyenhuis

There is no Kwantlen news affecting articulation. We now have sample finals for most of our courses on the Kwantlen library website. They are under "Reserves" on http://www.kwantlen.ca/library. Search by course number to get the sample finals. We have no sample finals under Math 2335 (Stats for Life Sciences) but those for Math 2341 or Math 1115 serve as samples. Course numbers and descriptions can be found at http://www.kwantlen.ca/calendar/courses/mathcrs.html. Enrolments in the sciences at Kwantlen seem to have levelled off.

As was reported last year, we started a Math Assistance Centre on the Surrey campus for our precalculus students. The idea was that students would drop in to the MAC once a week, write an assignment, or lab, that had been chosen by their instructor, get help while doing the lab, and finally get a grade for their work. Because of the help, students often got 100% on their completed labs. The labs were worth a total of 10% of the course grade. Students were generally happy with the MAC, and faculty working there felt it helped the students. We don't have data yet to support these feelings though.

LANGARA – Nora Franzova

Registration:

For the Spring semester registration was up and for the Summer semester the college registration is 10% up from last year's Summer. Math registration is consistent with this. We had to turn away a few students from our waitlists in the Summer. Since Langara now has a BBA, the business math classes have increased, but not Business Calculus. We have two new hires, both were hired for Statistics classes.

New/ Old:

College approved an increased prerequisite requirement for going from our Precalculus (Math1170) course into our Business Calculus (Math1174) course from C - to C+.
First time since its approval we offered the Numerical Analysis course – 8 students took the course. We plan to offer it again and alternate it with the Mathematical Modeling course that is already approved and is in our book.

Real Analysis is now offered once a year.

The college is opening a new program – Health Sciences.
Health Sciences is an interdisciplinary approach, which examines health, illness, and disease in human communities. While Health Sciences builds upon the basic sciences, it also draws from research-oriented fields such as psychology and economics.

Students may pursue the Arts or Science stream, resulting in a Diploma or an Associate Degree. After completing the program, students may continue their studies at SFU's Faculty of Health Sciences transferring seamlessly into third year studies. The Math department is quite involved by partly designing their main (first) course which involves quite a bit of Statistics.

The Computer Department is proposing to offer a Bachelor's Degree in math and computer science. It is still only an idea, but an interesting one.

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

How many teaching hours in a usual first year Calc and Stat course? (This was a question from last year)
The debate is now raging over cutting back each "hour" of a class to be 50 minutes, instead of the 55 that it is right now.

NEW CALEDONIA – Nicolas Buck
Enrolments appear to be up slightly.
We have a new Calculus for Non-majors (Math 165) course.
We have increased the weekly lecture hours in Elementary Statistics (Math 104) from 3 to 4.
We have discontinued using Maple as an instructional aid in our first-year calculus sequence.

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) currently offered
- Math 100 (PreCalculus), Math 110 (Finite), and Math 120 (Intro Statistics) are not subscribed to.

NVIT is using ***Accuplacer*** for entrance math diagnostics

NVIT has a satellite campus in Burnaby

New Programs:

Bridging the Trades
Education Coordinator
First Nations Speech Language Assistant
Access to Practical Nursing
Aboriginal Community and Health Development
Aboriginal Human Services Diploma
Foundational Skills Certificate in Counseling
Understanding Disabilities in Human Services Certificate

NORTH ISLAND—Jason Diemer
Dr. Jan Lindsay is the new NIC President.
New course: MAT 133, Matrix Algebra. This course is part of a new first-year engineering transfer program with the UVic Faculty of Engineering. Calculus enrolment should be strengthened by this new offering.
Math enrolment last year, relative to the year previous, was steady if not slightly stronger.
Spring/summer enrolment in ABE mathematics courses was strong last summer, and it appears that this will be the case this spring/summer as well.
Second-year mathematics has been cancelled. Also, MAT 100 (precalculus), MAT 102 (brief calculus), and MAT 151 (finite math) will not be offered this year. These changes are due to a combination of low demand and budget cuts.

NORTHERN LIGHTS – Hongbin Cui
Enrollment has been steady. There have been no course changes.

NORTHWEST – Mona Izumi
Enrolments in calculus this past year were up in Terrace but considerably lower in Prince Rupert. That was the case for all UT courses on the two campuses.

Introductory Stats continues to be well subscribed as a service course for several career programs. Business Administration will not be offering their own section this year.

Mathematics for Elementary Teachers was offered online in both fall and winter semesters and were fully subscribed. No face to face sections were offered at NWCC this year.

Math 123 for Arts students was offered for the first time. Interestingly it was a class of nine mature female students who all worked very hard and did very well.

I am developing Finite Math for the NCIT program and it will be delivered in the fall.

OKANAGAN – Clint Lee

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

- No new programs or courses were introduced.
- Course enrolments were stable.
- We continue to be primarily a service department, offering courses for the OC BBA program and for six two-year technology diploma programs.
- We continue to offer first-year university transfer at Kelowna, Vernon, Penticton and Salmon Arm and to offer selected second-year mathematics and statistics courses at Kelowna. Low enrolments in second-year courses are a major concern.
- There are no cuts to any Okanagan College programming planned for 2009-2010.
- We added a new continuing Math & Stat faculty member at our Penticton campus - Shawn Desaulniers (Ph.D. University of Alberta).

SELKIRK – David Feldman

(1) Overall report prepared by Neil Coburn

The following is a summary of major happenings at Selkirk College over the period of April 1, 2008 and March 31, 2009

Academic

- Funding was received to add a second stream in the Electrical Entry program which will greatly increase access to this popular program;
- An on-line golf program (Golf Club Operations On – Line or GCOOL) is launching in the spring of 2009. This program replaces the cancelled Golf Club Management program;
- At the end of the 2007 – 2008 academic year, the Human Kinetics, Process Operator and Advanced Business Technology programs were cancelled. In the case of the first two, low enrolment played a major role in the decision; in the case of the latter, all courses were available online to students in our region through BC Campus. In all cases, cuts in the college's funding was a factor. Layoffs were issued to instructors in these programs.

Senior Personnel changes

- With the resignation of the college's Director of HR, the decision was made to move Louise Krohn, VP - Academic and Student Development (VP-A&SD) into that role.
- The vacated VP-A&SD position was filled by Angus Graeme.
- Angus' vacated Dean's position responsible for the Schools of Health & Human Services, Renewable Resource and Kootenay School of the Arts was in turn filled by Rhys Andrews.

Budget News

- In 2008 – 2009, the Ministry reduced Selkirk's base funding by approximately 2.6%; the college has subsequently received an increase of 2.1% in operational funding for the 2009 – 2010 budget year. In addition, one time funding of over $300, 000 has been received. This is good news has improved our 2008-09 year-end and the outlook for 2009-10.
- The Federal and Provincial governments have acted together in providing what the Fed's have called Knowledge Infrastructure Funding. Selkirk has received $1.88 million to replace HVAC equipment on the Castlegar campus. Besides providing a much improved cooling system, this upgrade will see the college reduce GHG (Green House Gas) emissions and fuel consumption by approximately 40%.
- The college continues to look for the funding necessary to renovate and reopen the Tenth Street campus student residences in Nelson.

News

- The Southern Interior Development Initiative Trust (SIDIT) announced two award programs which represent a total of almost $200,000 to support students:

- The Trades and Technology Awards (total of $96,000) are available to qualified students studying in any of a large variety of trades or technology programs.
- Secondary School Awards (total of $100,000) are available to support high school students registered in any of Selkirk's transition programs.

- Selkirk College received NSERC (Natural Sciences and Engineering Research Council) eligibility in 2008 and thus is able to apply for research funding from NSERC and other federal funding agencies.

(2) Report on changes to math courses

Last year, we made the decision to phase out our two-semester finite math offering Math 130 and Math 131. The initial impetus for this decision was the business program requesting that we review our offerings as the finite math, they felt, was not serving their students.

For the business programs, we proposed a two-semester sequence of a math for business course (Math 125) and our existing statistics course Stat 105.

Our remaining students in 130 and 131 would have been elementary ed students and liberal arts students. We decided to create a sequence of courses: Math 180 and Math 181 to serve these students. Math 180 is an actual elementary ed course. Math 181 is a problem solving course intended for either students who have completed Math 180 or liberal arts students who need a math credit.

Math 180 will be a four-credit, four-hour-a-week course and will be offered in the fall of this year.

Math 181 will be a three-credit, three-hour-a-week course and will be offered in winter 2010.

(3) Calculus retention project

Like many other institutions, Selkirk has an ongoing problem with success rate in calculus. After some negotiation with our administration we arrived at the following plan.

We will provide students with a review package and administer a placement test before the class begins. We will also provide a one-week review class (optional) before class begins. Students who do not perform adequately on the placement test will be directed to enrol in pre-calculus instead of calculus.

To allow students who need pre-calculus in the fall to complete 1st year math in one year, we will offer a section of second-semester calculus in the spring (instead of the fall).

(4) Math enrolments are slightly up again, they have been slowly but steadily increasing since they took a dive in 2005.

SFU – Malgorzata Dubiel (for Dave Muraki)

1. We have (again) increased the prerequisites for most of our first-year calculus courses, in response to the dropping of the provincial math exam. The BC Principles of Math 12 pre-requisite grade for MATH 151 has been raised to A, and for the review version, MATH 150, is now B+. (Prerequisites for MATH 154 and 157 remain a B.)
2. Our enrolment in "remedial" courses: FAN X99 and MATH 100, has been sharply increasing over the past two years.
3. We are presently working on designing a distance education (video correspondence) version of our MATH 150 course. The course will be our second distance education course – we have been offering MATH 190 as a distance course for many years.
4. We have introduced three new themed special topics courses at the 3rd year level that target math minors in science and technology majors. These courses will also be of interest for people who intend to teach mathematics in high schools. The themes, with their calendar descriptions are:
   - Computing with Math (MATH 302): Computational techniques have become a cornerstone of modern mathematics. Each offering explores the mathematics of an area of advanced technology. Potential course topics include: image processing; codes & ciphers; bio-informatics; experimental mathematics; and modeling & simulation.
   - Perspectives on Geometry (MATH 303): Geometry is the mathematics of form and space, and is vital to our understanding of both the physical and virtual worlds. Designing computer graphics is an example of using

mathematics to encode spatial relationships. Potential topics include: Euclidean and non-Euclidean geometries, computational geometry, differential geometry, and symmetry.

- Quantifying Uncertainty (MATH 304): Probability theory is the mathematics of uncertainty – as in weather forecasting, genetics, the financial markets, and even your choice of line at the grocery. Here we explore models that quantify chance in daily life. Potential topics are: game theory, queuing theory, random processes, and the mathematics of finance.

5. A re-organization of the Surrey-based stream of the Industrial Math Program – the Operations Research and Applied Statistics (ORAS). The changes are a response to the continuing evolution of the course offering template at the Surrey campus, as well as, the new hires in the Mathematics Faculty there. The program has an increased emphasis on Statistics, and retains the breadth requirement for interdisciplinary study. A new second-year introductory course, MATH 208: *Introduction to Operations Research*, debuts in Fall 2009.

SFU (Statistics) – Richard Lockhart

1) No major changes in the last year.

2) A complete review of our undergraduate program will take place this year.

3) We are in the process of designing a new version of STAT 302, a second service course in STAT, to be specifically targeted at Health Sciences students. It may either be an annual special offering of STAT 302 or we may give it a new number.

4) A new version of STAT 270, our calculus based intro stats course may be designed for the Mechatronix program at Surrey.

5) There are 20 faculty members in SFU Stat and Act Sci of whom 3 are actuaries and a further 2are located at our Surrey campus.

6) Service course enrolments continue to grow slowly. Numbers in our upper division courses and numbers of majors are slightly off but not importantly relative to the year to year fluctuations in these numbers.

7) The university's financial difficulties have not impacted our department much though we did cancel 1 offering of a service course for 2009/10. These difficulties may slow our efforts to replace Randy Sitter and Larry Weldon.

8) We now offer STAT 201 (intro stat for life sciences) by distance. Enrolments in our other distance courses, STAT 101 (general intro stat) and STAT 270 (intro calculus based stat) have been very steady -- at the limit permitted by distance education in some cases.

THOMPSON RIVERS – Robb Fry

Below are listed some of the highlights in the Maths and Stats department at TRU since the 2008 articulation

- The department of mathematics and statistics is discussing modifying Maths 212 Linear Algebra I and Maths 307 Linear Algebra II to be more compatible. As well, the department is planning on increasing its number of upper level course offerings.
- TRU has a new president, Dr. Kathleen Scherf. She has initiated a restructuring at TRU which will result, in particular, to the dissolving of the School of Advanced Technologies and Mathematics. The department of Mathematics and Statistics as of 2010 shall be part of the Faculty of Science.
- Mr. Daryl Funk obtained his M.Sc. degree from The University of Victoria under the supervision of Dr. Rick Brewster, Associate Professor in the department of Mathematics and Statistics, TRU.
- Mr. David Nilsson completed his fourth year honours thesis.
- Dr. Rick Brewster, Dr. Mohamed Tawhid, and Dr. Roger Yu obtained five year NSERC discovery grants.
- Ms. Fae Debeck is planning to move into a part time position.
- The department will (consecutively) host the annual high school mathematics contest, the BCCUPMS meeting, and the conference entitled, Sharing Mathematics – A Tribute to Jim Totten.
- Mr. Dave Tomkins stepped in as acting Dean of the School of Advanced Technologies and Mathematics after Dr. Don Noakes finished his term. Dr. Noakes is presently a member of the department of mathematics and statistics.
- A number of people from the department of mathematics and statistics are applying for promotion or tenure.

- The department of mathematics and statistics is trying to initiate, with the cooperation of the computing science department, joint degrees in mathematics and computer science, as well as a joint honours degree in computing and mathematics. No course changes have occurred yet.
- The open learning department has recently begun a liaison with the department of mathematics and statistics, resulting in the extensive updating of the open learning based Business Mathematics course and Mathematics for elementary teachers course.

THOMPSON RIVERS (OPEN LEARNING) – Veda Abu-Bakare

We are now into our 4th year of being part of TRU. We had been tracking a drop in enrollment of 20-25% but this year for the first time the tide has turned. We are working on two new OL courses that parallel the campus courses, MATH 191 Math for Elementary Teachers and MATH 107 Business Precalculus. These should be up and running this year.

We have also had the opportunity of a face-to-face meeting with some of the Faculty from the Math and Stats Department on campus and the OL Math Tutors at a recent Tutor Workshop. An Area Coordinator, Chris Morgan, OL Tutor, has been appointed - he will act as a liaison between OL and campus Faculty. The intent is to have closer working ties between the two groups and to align courses and programs.

TRINITY WESTERN – Richard Atkins

UBC (Okanagan) – Qiduan Yang

Changes: Not in the 1st or 2nd year curriculum.

Enrolment: The enrolment of two Calculus 1 courses, MATH 100 for Science and MATH 116 for management and economics, is down from September 2007 to September 2008. The numbers are shown in the following table.

Course	Student number in Sep. 2007	Student number in Sep. 2008	% of increase
MATH 100	415	371	-10.6
MATH 116	155	145	-6.45
Overall	570	516	-9.47

Notes:

- MATH 125 (Pre-calculus) Student number 83.
- MATH 126 (Pre-calculus with aboriginal perspectives) student number: 24.

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

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

UBC (Statistics) – Bruce Dunham

The year saw the appointment of a new head of department, Prof Nancy Heckman, who took over from Prof Will Welch in the Summer of 2008 after a short interim headship of Prof Harry Joe. Other news includes an approval for the construction of the new building that will house the department, which is expected to be completed by 2012. The new building will also accommodate the Department of Earth and Ocean Science, PIMS and the office of the dean of Science.

Graduations from specialist degrees within the department continue to be healthy, with 34 graduating since May 2008. The figure excludes those obtaining a minor in Statistics, of which there were about a dozen.

A "new" course, STAT 335: Statistics in Quality Assurance was offered in term 1 this year, this course being in fact a revival of an existing course that had not been offered for around ten years. The course is accessible to those who have taken any one of various first courses in Statistics at UBC, and proved a success, attracting around forty students. Numbers will be bolstered next year by the addition of a cohort of students from Forestry.

Two matters of interest on a faculty-wide scale in Science at UBC: firstly, the General Science program is being revamped, with the aim being to make this a "program of choice". All General Science students will now be obliged to take STAT 200 (or BIOL 300), and students on the program can opt for one of several "thematic streams" in the mathematical and computational sciences. The program is well-suited for students interested in a career in teaching. Finally, the faculty has issued a directive that all 100-level (and surely soon to be extended to 200-level) courses in the faculty must have a publicized set of learning outcomes. These outcomes should prove helpful in matters regarding course articulation.

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

UBC (Vancouver) – Wayne Nagata

All non-honours Calc 1 (differential calculus) courses except UBC MATH 110 (i.e., UBC MATH 100, 102, 104, 180, 184) now have a prerequisite of (a) 80% in B.C. Principles of Mathematics 12 or (b) 73% in the provincial examination for B.C Principles of Mathematics 12 or (c) a satisfactory score in an assessment test given by the UBC Mathematics department. At this time it appears that a student transferring to UBC meets option (a) with a grade of 80% in a Precalculus course at a sending institution.

The prerequisite for UBC MATH 110 is now B.C. Principles of Mathematics 12 or Precalculus. All students in MATH 110 are required to write an assessment test before the end of the first week of classes in September, and those that score sufficiently high on this test will be placed in a Calc 1 course. (UBC MATH 110, introduced a year ago, is an eight-month, 6-credit course that covers essentially the same topics as a traditional Precalc-Calc 1 course sequence, but in a different order. It is intended for students with insufficient secondary school mathematics preparation, and the Mathematics department intends to prevent overqualified students from taking the course.)

A few small changes have been made to prerequisites and credit exclusions for higher-level courses. Small changes have also been made to most Mathematics Program (B.Sc./ B.A.) requirements. Perhaps of interest is that all B.Sc. programs, except Combined Honours Physics and Mathematics, now require only 3 credits of Physics beyond the secondary school Physics 12 level (6 were required previously).

As Bruce Dunham mentioned, all 100-level UBC Science courses are now required to have a list of learning outcomes, and a revision process is underway for the General Science degree program.

UNBC – Jennifer Hyndman

Dr. Don Cozzetto unexpectedly stepped down as President in June of 2008. Dr. Charles Jago returned as Interim President for one year. Dr. George Iwama will start as President of UNBC on July 1, 2009.

UNBC expects a slight increase in enrollment in September 2009 over September 2008.

Mathematics changes include moving MATH 226 Advanced Linear Algebra to MATH 326 Advanced Linear Algebra.

We have also introduced XMAT 161-1 Intermediate Algebra: Module I, XMAT 162-1 Intermediate Algebra: Module II, and XMAT 163-1 Intermediate Algebra: Module III through our continuing studies program. These courses are each 20 contact hours and recieve one credit hour which can be used for credit at UNBC.

A Minor in Statistics is moving through the approval process.

UVIC – Gary MacGillivray

We are currently in the midst of a three or four year curriculum renewal project. Last year we renumbered many of our courses, and made some significant changes at the third and fourth year levels.

The Math degree programs were re-done, with some changes to the presentation and requirements. In particular the second year discrete math course is now required for all math degrees. If there are to be significant curriculum changes at the first and second year level, they will be brought forward this year or next. It is too soon to say what those changes might be.

Last year we made some alterations to pre-requisites in preparation for the upcoming introduction of the WNCP Curriculum. Foundations 12 will be an acceptable pre-requisite for Math 151 and 161. We also made a topics swap in our "discrete math" courses with functions and relations, and cardinality of sets, moving back to the first year course while

recurrences, almost all of the counting, and graph theory moved to the second year course. The first year course is now true to its title "Logic and Foundations", and is not a discrete math course in any realistic sense. Instead, it is a proofs course. The reason for the change was to eliminate overlap between the second year discrete math course and the second year introductory abstract algebra course. The Logic and Foundations course is a pre-requisite for both. The material that was shifted to Logic and Foundations was deleted from the introductory abstract algebra course, but no alternate material has yet been put in its place. Possibly the existing topics will be treated more slowly and in more depth. These changes will take effect in September 2009.

VCC – Jean McLeod

We are in a period of transition at the college as we are currently searching for a President, VP-Education and a Registrar.

The Math Department is offering three UT courses: Calculus 1, Calculus 2, and Statistics. We offered a section of Statistics for our new Bachelor of Nursing program this year and will likely continue to do this.

There was a decision made that only UT courses that feed other programs at the college should be offered, so 1st year Physics was cancelled last year and probably won't be offered again. This has obviously hurt our Calculus enrolments. As Calculus doesn't feed any programs either, we feel that it may be marked for elimination at a future date … we're holding our breath.

VANCOUVER ISLAND UNIVERSITY (formerly Malaspina) – Dave Bigelow

Vancouver Island University (VIU), previously known as Malaspina University-College is a new SPT University. In the last two years the institution has experienced a large turnover in senior administration. We have a new president, vice-president academic and vice president financial to name a few. The faculty of Science and Technology has had three temporary deans in a year and is hoping a more permanent dean will be hired shortly. The mathematics department has recently lost three regular faculty members including Ian Bailey (retired) and Dean Slonowski (resigned). The department is hoping to hire a new statistician to fill some of this void.

The department has lost a number of sections as various programs around campus have reduced their math offerings. Most recently the Education faculty lowered its admission standards from six Math credits to three Math credits. Thus, next year will likely be the last time Math 132 will be offered at VIU. Lower enrolments in computer science are also reducing student numbers in some Math courses. Mathematics has traditionally been a service department but this role is being somewhat diminished. The department is therefore planning to expand its degree offerings and become more independent. The department is hoping to introduce a mathematics major degree within the next two to five years. Preliminary discussions are underway.

YUKON – Tim Topper

7. COMMITTEE BUSINESS

7.1 Theme for our 88th Meeting

Suggested topics for the 88th meeting included: on-line courses (Tim Topper), assessment tests (Susan Oesterle), sustainability and environmental issues—the sharing of models (Nora Franzova); math/stats courses offered in different departments; the meaning of grades (Bevin Ferreira); experiential teaching (Larry Weldon); the role of colleges in helping students transition from high school to university (Wesley Snider); different learning styles or approaches (Len Berggren); and outreach (David Feldman).

7.2 Date and Location of the 88th Meeting

The 88th meeting will be held at Simon Fraser University in Burnaby, May 11 – 13, 2010. Malgorzata will check to see when the residences are available.

In 2011, the 89th meeting will be hosted at Okanagan College.

There was some discussion of the usefulness of the half-day PD session. Malgorzata Dubiel suggested that we could make the Sharing Math Conference an annual part of our meeting. It was decided that this could be discussed further on the last day of the Sharing Math Conference.

7.3 List Updates: E-mail.

Members were asked to ensure that addresses on the email list are correct. Please keep Ian Affleck up to date with your information and contact Leo Neufeld for changes to the listserve.

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

8. Adjournment of the Wednesday session

The Wednesday Session of the 87th meeting of the BCcupms adjourned at 4:13 p.m.

Many, many thanks to Fae DeBeck and the Mathematics Department at Thompson Rivers University for all their work in hosting us for this meeting.

List of Committee Members Present

Plenary Session – Tuesday, May 12, 2009 (a.m./p.m.); Concurrent Math/Stats – Tuesday, May 12, 2009; Secondary Teachers Session – Tuesday, May 12, 2009; Plenary Session – Wednesday, May 13, 2009 (a.m./p.m.)

Name	Institution	TUES	MATH	STATS	TEACHER	WED
Veda Abu-Bakare	Langara College/ Thompson Rivers University (Open Learning Division)	X		X	X	X
Richard Atkins	Trinity Western University	X	X		X	X
Jim Bailey	College of the Rockies (Chair)	X	X		X	X
George Ballinger	Camosun College	X		X	X	X
Deanna Baxter	Capilano University	X	X		X	X
Gera Belchev	Coquitlam College	X	X		X	X
Len Berggren	Alexander College	X	X		X	X
Dave Bigelow	Vancouver Island University	X	X		X	X
Rick Brewster	Thompson Rivers University					a.m.
Nicholas Buck	College of New Caledonia	X	X		X	X
Winona Cordua-von Specht	British Columbia Institute of Technology	X	X		X	X
Hongbin Cui	Northern Lights College	X				X
Fae DeBeck	Thompson Rivers University					a.m.
Richard DeMerchant	BC Ministry of Education	X	X		X	
Jason Diemer	North Island College	X	X		X	X
Malgorzata Dubiel	Simon Fraser University	X	X		X	X
Bruce Dunham	University of British Columbia—Statistics (Chair of Statistics Subcommittee)	a.m.		X		X
Brad Epp	Kamloops School District				X	
David Feldman	Selkirk College	X	X		X	X
Bevan Ferreira	Selkirk College	X		X	X	X
Nora Franzova	Langara College (Vice Chair)	X	X		X	X
Robb Fry	Thompson Rivers University					X
Al Fukushima	Nicola Valley Institute of Technology	X		X	X	X
Paramjit Gill	University of British Columbia (Okanagan)	a.m.		X		X
Sonja Hot	Thompson Rivers University					a.m.
John Grant McLoughlin	University of New Brunswick				X	
Dan Henschell	Douglas College	X		X	X	X
Jennifer Hyndman	University of Northern British Columbia	X	X		X	X
Mona Izumi	Northwest Community College	X	X		X	X
Gabriela Kakushkin	Vancouver Community College	X		X	X	X
Lisa Lajeunesse	Capilano University	X		X	X	X
Clint Lee	Okanagan College	X	X		X	X
David Leeming	Pacific Institute for the Mathematical Sciences	X	X		X	X
Richard Lockhart	Simon Fraser University (Statistics)	X		X	X	X
Maria Maciaszek	Okanagan College	X	X			
Jean MacLeod	Vancouver Community College	X	X		X	X
Gary MacGillivray	University of Victoria	a.m.		X		X
Wayne Nagata	University of British Columbia (Vancouver)	X	X		X	X
Leo Neufeld	Camosun College (Retired)	X	X		X	X
Michael Nyenhuis	Kwantlen Polytechnic University	X	X		X	X
Susan Oesterle	Douglas College (Secretary)	X	X		X	X
Shane Rollans	Thompson Rivers University	X		X	X	X
Greg Schlitt	University of the Fraser Valley	X	X		X	X
Wesley Snider	Douglas College	X	X		X	X
Mohamed Tawhid	Thompson Rivers University	p.m.	X			
Satoshi Tomoda	Okanagan College	X	X		X	X
Tim Topper	Yukon College	X	X		X	X
Dave Van Bergeyk	BC Association of Mathematics Teachers and Salmon Arm Secondary	X	X		X	
Larry Weldon	Simon Fraser University—Statistics (Retired)	X		X	X	X
Qiduan Yang	University of British Columbia (Okanagan)	X	X		X	X

*Columbia College did not send a representative.

BC Secondary School Mathematics Contest 2009
Report to the BCcupms

On May 8, 2009 the Final Round of the BC Secondary School Mathematics Contest was written at 11 provincial colleges, university colleges, and universities. Students who had performed well on an earlier preliminary round held within their own high schools were invited (together with a teacher sponsor) to attend the final round and spend a day at the local post-secondary institution with several activities involved.

This year the participating institutions were:

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

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

Institution	Final Round		Top Three Scores		Averages	
	Juniors	Seniors	Junior	Senior	Junior	Senior
Cam	18	18	100, 92, 91	90, 79, 73	64	55
Cap	21	17	100, 100, 100	85, 84, 82	70.3	80.8
CNC	23	20	75, 70, 61	72, 66, 64	40	48
Doug	12	11	100, 100, 95	87, 85, 83	78.7	65.5
Lang	20	7	97, 88, 87	91, 84, 81	64	80
NIC	15	18	44, 45, 46	67, 70, 77	33.9	50.9
NWCC	2	3	49, 37	63, 39, 35	43	46
OC/UBCO	45	20	90, 81, 72	99, 81, 72	39.4	47.1
TRU	23	39	82, 71, 68	64, 62, 58	44.4	40.1
VIU	33	41	97,91.5,73	79, 76, 73	41.7	49.8
UCFV	68	39	100, 94, 89	76, 69, 66	39.2	43.5
TOTAL	280	233				

Approximately 1400 Juniors and 900 Seniors wrote the Preliminary Round this year. The top reported Junior and Senior Preliminary scores were both 60 out of 60. Note that not all schools report Preliminary Round scores or participation numbers, so these are not a completely accurate reflection of the level of participation in the Preliminary Round. A total of 513 students participated in the Final Round this year, up slightly from last year.

The Preliminary Round is handled in essentially the same way at all institutions. The preliminary test papers are mailed to participating schools. The tests are administered and marked at the schools and the results, including the names of the Final Round participants, are transmitted to the hosting institution. The Final Round does have variations. At all institutions the Final Round contest is administered on the morning of May 9, with some type of activity provided for the sponsoring teachers, and, after the contest is completed, lunch is provided for all participants. After lunch the activities vary. Some institutions have talks for the participating students and teachers, others combine talks with other activities, such as a math relay or scavenger hunts. During the time that the afternoon activities are taking place, the tests are marked, and later in the afternoon prizes awarded. The prizes vary among institutions. Some institutions give book prizes to all or selected participants; some institutions give cash prizes and/or scholarships to winners; many give T-shirts to all participants.

Thanks should go to those who have organized the Contest at their individual institutions and encouraged their local schools to participate in the Contest. First there are the primary organizers at each of the Colleges: Wayne Matthews at Camosun College; Marsha Anderson at Capilano University; Nicholas Buck at College of New Caledonia; Dan Henschell at Douglas College; Nora

Franzova at Langara College; Jason Diemer at North Island College; Mona Izumi at Northwest Community College; Clint Lee and Leslie Corbett at Okanagan University College and Wayne Broughton at UBC Okanagan; Fae Debeck at Thompson Rivers University; Ian Affleck at University of the Fraser Valley; and Patrick Ng at Vancouver Island University College. Although these are the primary organizers at each institution, it goes without saying that they do NOT do all the work required to make this contest a success. Indeed, they have indicated that their entire departments are involved with hosting the contest. Special thanks should go, again, to John Grant-McLoughlin of University of New Brunswick, who, as a professor in Mathematics Education, continues his involvement with our contest even though he is at other end of the country. This year we were fortunate to have John participate in the contest in person at Okanagan College.

Furthermore, the problem posers who either submitted problems or came together at the Langara College last May in Vancouver to put together the initial drafts of the contest papers are: Wayne Matthews and Chris Odgers (Cam), Jim Bailey (COTR), Rob Miller (CNC), Clint Lee and David Murray (OC), Susan Milner and Ian Affleck (UFV), Nora Franzova (Lang), Mona Izumi (NWCC), Glen Pugh (VIC), and Lisa Lajeunesse (Cap).

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

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

This report, together information on winners from the individual institutions, will be posted on the BCSSMC web site at people.okanagan.bc.ca/2009/MathContestBCCUPMReport_2009.htm.

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

For those planning for next year, the dates I am suggesting for the 2010 contest are:

Preliminary Round:	Wednesday March 31/April 7, 2010
Final Round:	Friday May 7, 2010

Respectfully submitted to the BCcupms on May 12, 2009 by

Clint Lee
Okanagan College, Vernon

MINUTES OF THE STATISTICS SUBCOMMITTEE
87TH BCcupms MEETING

TUESDAY, MAY 12TH, 2009

Present: Veda Abu-Bakare (Langara College and Thompson Rivers University – Open Learning Division), George Ballinger (Camosun College), Bruce Dunham (University of British Columbia, Vancouver), Bevan Ferreira (Selkirk College), Al Fukushima (Nicola Valley Institute of Technology), Paramjit Gill (University of British Columbia, Okanagan), Dan Henschell (Douglas College), Gabriela Kakushkin (Vancouver Community College), Lisa Lajeunesse (Capilano), Richard Lockhart (Simon Fraser University), Gary MacGillivray (University of Victoria), Shane Rollans (Thompson Rivers University), Larry Weldon (Simon Fraser University)

Chair: Bruce Dunham

Acting Secretary: Richard Lockhart

1. Approval of Agenda

Motion of approval of agenda: Moved: Gary MacGillivray; seconded Veda Abu-Bakare. **Carried unanimously.**

2. Approval of minutes of the Statistics Subcommittee Session of the 86th meeting

Motion of approval of minutes: Moved: Bevan Ferreira; seconded Shane Rollans. **Carried unanimously.**

3. Matters arising from minutes

Bruce Dunham reported that he had looked into the possibility of applying for funding for the creation of a "flexible pre-major" in Statistics. On consideration he had come to the decision that it was easier for him to attempt this without the need for BCCAT support, and had started the process in consultation with Leo Neufeld. Bruce aims to have completed this by the next articulation meeting, should such a pre-major be viable.

4. Institutional Reports

Camosun College

Prerequisites: Students can now use Math 109 (Finite Math) as a prerequisite for Math 216 (Applied Statistics). Previously, the only prerequisite for Math 216 was Principles of Math 12. This change is consistent with the prerequisite for the course that it transfers to, STAT 252, at UVIC.

Subject to College approval, Math 116 (Elementary Statistics) will now accept Applications of Math 11 as a prerequisite to the course. Consultation with the Universities has confirmed that this change from Principles to Applications will not affect transferability.

Enrolment: An enrolment decline in Math 116 resulted in the loss of one section.

Faculty: Geoff Salloum will be on a one-year leave of absence starting in September 2009. We are currently in the process of hiring a term replacement.

Capilano College

Ken Towson and Reimar Hauschildt have completed a Statistics text based on sports and leisure activities, and this has received some good feedback. The authors are currently in search of a publisher. Reimar is due to retire shortly. There is a subsequent danger of under-staffing.

Douglas College

For the first time an on-line course was offered in Statistics, this being in parallel to the usual intro course. The perception is it was a mixed success.

Langara College

The college has enjoyed a good year with no major problems. There was some dissatisfaction expressed however with the text currently being used for Business Statistics, namely Berenson and Levine. A request is made for suggestions for alternatives to this text.

Nicola Valley Institute of Technology

The institute now has a campus in Burnaby, the location being formerly IIG.

Selkirk College

There is important news concerning the scrapping of our Math 130/131 combination (College Math I and II). Typically, Math 131 was an introduction to probability, counting, and some elementary distributions, and in the past had provided our Business Admin students with their introductory Statistics experience. We have found this to be unsatisfactory, but have been reluctant to create a "Business Statistics" course as such. As a result, our Business students will now take Stat 105, our Intro Stats course for non-Science majors in their second semester of first year. The Math 130 has been replaced with an introductory Business Math course (Math 125) focusing on financial calculations, and also in its Arts and Social Sciences form as a Math for Elementary Ed course.

The Stat 206 course continues with steady, but low enrolment, but as a positive side-note, in the last two years we have successfully encouraged two students out of the eight that took the course, to pursue full-time study in Statistics.

Simon Fraser University

1) No major changes in the last year.
2) A complete review of our undergraduate program will take place this year.
3) We are in the process of designing a new version of STAT 302, a second service course in STAT, to be specifically targeted at Health Sciences students. It may either be an annual special offering of STAT 302 or it may be given a new number.
4) A new version of STAT 270, our calculus based intro stats course may be designed for the Mechatronix program at Surrey.
5) There are 20 faculty members in SFU Stat and Act Sci of whom 3 are actuaries and a further two are located at our Surrey campus.
6) Service course enrollments continue to grow slowly. Numbers in our upper division courses and numbers of majors are slightly off but not importantly relative to the year to year fluctuations in these numbers.
7) The university's financial difficulties have not impacted our department much though we did cancel one offering of a service course for 2009/10. These difficulties may slow our efforts to replace Randy Sitter and Larry Weldon.
8) We now offer STAT 201 (intro stat for life sciences) by distance. Enrollments in our other distance courses, STAT 101 (general intro stat) and STAT 270 (intro calculus based stat) have been very steady - at the limit permitted by distance education in some cases.

Thompson Rivers University

There have been stable enrolments in the past year. A new statistician has lead to a multivariate course for environmental science.

Thompson Rivers University – Open Learning Division

We are now into our 4th year of being part of TRU. We had been tracking a drop in enrolment of 20-25% but this year for the first time the tide has turned. Our single Statistics course, STAT 102 is still doing well with the De Veaux and Velleman "Intro Stats" text and a graphing calculator.

University of British Columbia, Okanagan

There are three statisticians in the department of Maths, Statistics and Physics, namely Profs Gill, Esterby and Loeppky. Three intro stats courses are currently offered.

University of British Columbia, Vancouver

The year saw the appointment of a new head of department, Prof Nancy Heckman, who took over from Prof Will Welch in the Summer of 2008 after a short interim headship of Prof Harry Joe. Other news includes an approval for the construction of the new building that will house the department, which is expected to be completed by 2012. The new building will also accommodate the Department of Earth and Ocean Science, PIMS and the office of the dean of Science.

Graduations from specialist degrees within the department continue to be healthy, with 34 graduating since May 2008. The figure excludes those obtaining a minor in Statistics, of which there were about a dozen.

A "new" course, STAT 335: Statistics in Quality Assurance was offered in term 1 this year, this course being in fact a revival of an existing course that had not been offered for around ten years. The course is accessible to those who have taken any one of various first courses in Statistics at UBC, and proved a success, attracting around forty students. Numbers will be bolstered next year by the addition of a cohort of students from Forestry.

Two matters of interest on a faculty-wide scale in Science at UBC: firstly, the General Science program is being revamped, with the aim being to make this a "program of choice". All General Science students will now be obliged to take STAT 200 (or BIOL 300), and students on the program can opt for one of several "thematic streams" in the mathematical and computational sciences. The program is well-suited for students interested in a career in teaching. Finally, the faculty has issued a directive that all 100-level (and surely soon to be extended to 200-level) courses in the faculty must have a publicized set of learning outcomes. These outcomes should prove helpful in matters regarding course articulation.

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

Four new courses are moving through the approval process:
- MATH 471-3 Linear Models
- MATH 472-3 Survey Sampling Design and Analysis
- MATH 473-3 Experimental Design and Analysis
- MATH 475-3 Methods for Multivariate Data

There will be corresponding graduate level cross-listed courses. A Minor in Statistics is also moving through the approval process.

University of Victoria

A review was undertaken of the validity of the current articulation agreements between UVic STAT courses and courses taught on Business programs across the province. The appropriateness of the transfer of credit from Business departments was doubted in some cases – the courses appear superficially similar to ours but are less rigorous when examined carefully. This lead to the rescinding of certain agreements that had been previously established.

Vancouver Community College

Many students at the college are looking to get into health science courses. This has impacted on enrolments in Statistics courses.

5. Appeals of articulation decisions

This topic was raised by Bruce Dunham following rather unusual circumstances relating to a request for him to revisit an articulation agreement between UBC's STAT 200 and a Business Statistics course at a sending institution in the province. Bruce confessed that he had no notion of how to handle appeals or complaints regarding articulation agreements, and asked the committee for guidance. What made the situation in the case at hand particularly awkward was that the appeal request came from another department within the sending institution. Bruce offered the opinion that there had been insufficient evidence put forward so far to oblige him to repeal his initial articulation decision, which was relatively recent, dating from the Summer of 2008.

The issue incited some heated debate, which as the Chair had anticipated resulted in discussions that overlapped with the subsequent agenda item. The views of those present were not completely aligned, but certain areas of concern were identified:

- How should appeals against existing articulation agreements be dealt with? Who should be permitted to appeal against a decision, and who would preside over appeals?
- What evidence could be presented to overturn an existing articulation decision?
- Is there a widespread problem with how Business Statistics courses are articulating with STAT courses in the province?
- Should there in effect be a two-tier system, recognizing that coures transfering onto specialist Statistics programs might be dealt with differently to other courses?

It was agreed that Bruce should, exceptionally in this case, contact the instigator of the appeal with a request that they may submit additional evidence should they wish. The matter was also raised at the main BCCUPMS committee later, and there was a suggestion that Bruce contact Finola Finlay (BCCAT) for guidance.

Action: Chair to contact instigator of appeal with a request for further evidence should the appeal be to progress further. The Chair is also to liaise with Finola Finlay of BCCAT to learn what guidelines are in place, if any, for handling appeals of articulation agreements.

6. Transfer of credit for Business Statistics courses

The discussion of this item largely overlapped with the previous one, and was in part motivated by UVic's recent review of their articulation agreements between their STAT courses and Business Statistics courses at sending institutions. It had been reported that, on closer inspection, many of these Business courses were deemed to be less demanding than was considered to be appropriate to transfer for credit to any of UVic's STAT courses. This lead to certain sending institutions being contacted and, it is understood, several articulation agreements being rescinded.

The Chair noted that UVic's STAT 2xx courses were rather different in nature to those at UBC-V, and that while recognizing there may be issues with courses taught by Business faculty he had no intention to undertake a similar review to the one that had occurred at UVic.

7. The objectives of service courses

There was limited time to discuss this topic, which is clearly of wide-ranging importance to Statistics teaching in the province. The brief discussion lead to a consensus that working closely with the "client" (or "mother") department was essential for the complete success of Statistics service course.

8. Election of Statistics chair for 88th meeting

Bruce Dunham had been elected last year for a further two-year term, so in fact there was no election required at this meeting. However, Bruce noted that from 2011 there was a possibility that personal circumstances may prevent his attendance at BCCUPMS meetings when held outside the lower mainland.

9. Any other business

The Canadian Mathematics Education Forum (CMEF) was held at SFU's Vancouver Campus, April 30 to May 3, 2009. A working group entitled "Significant Statistics" was organized by Kevin Keen (UNBC), and this was attended by a small group of interested Statisticians. The presentations included talks by Kevin Keen (on how a intro Statistics course at UNBC could form the basis for STAT 11 in BC high schools), Larry Weldon (on case studies and experiential learning in introductory courses) and Bruce Dunham (on his research into the difficulties students have grasping and retaining concepts from

introductory Statistics courses).

10. Motion to adjourn

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