THE BRITISH COLUMBIA COMMITTEE ON THE UNDERGRADUATE PROGRAMME IN MATHEMATICS

MINUTES OF THE 81st MEETING, MAY 22/23 2003

THURSDAY, MAY 22, 2003

1. WELCOME BY THE REPRESENTATIVE OF THE SELKIRK COLLEGE – Marilyn Luscombe

Marilyn Luscombe, the President of Selkirk College welcomed the BCCUPM representatives, and thanked Neil and his colleagues for their efforts in organising this year's meeting. She paid homage to John Peregrym, a long-time member of the BCCUPM, who is retiring this year after 37 successful years of teaching mathematics at Selkirk College. She acknowledged the importance of mathematics as the fundamental basis of many endeavours, and praised the work of the BCCUPM, noting the important role that articulation plays in facilitating both access for and the success of students, particularly those from rural areas. She thanked the BCCUPM for their ongoing work and wished the members well in their meeting at Selkirk.

2. ADOPTION OF THE AGENDA FOR THE 81ST MEETING OF THE BCCUPM

The Agenda for the 81st Meeting was adopted with the following additions: 5.3 Announcements from Neil Coburn and under New Business 5.4 A Discussion of Exam Exchange Online.

Motion: moved by Leo Neufeld and seconded by Jim Totten.
That the Agenda for the 81st meeting be adopted as amended. **Carried.**

3. ADOPTION OF THE MINUTES OF THE 80TH MEETING, HELD AT DOUGLAS COLLEGE

The Minutes of the 80th Meeting were adopted as posted on our website with the following changes:
Under section 2.3 Ministry of Education Report, page.8, line 5: materials originally came from Manitoba, not Alberta.

Motion: moved by Mona Izumi and seconded by Costa Karavas.
That the Minutes of the 80th Meeting be adopted as amended. **Carried.**

4. CORRESPONDENCE

A letter from Shirley Bond, the Minister of Advanced Education was received in response to our letter in support of OLA. The Minister thanked the BCCUPM for its input.

5. ANNOUNCEMENTS

5.1 **Notice of Elections:** At this Meeting, an election for **Vice Chair** of the BCCUPM, for **Secretary** of the BCCUPM and for **Chair of the Statistics Subcommittee** will be held. Leo Neufeld agreed to coordinate nominations for Vice Chair and Secretary. Roger Coroas offered to assist. Veda Abu-Bakare and Larry Weldon agreed to coordinate nominations for the Statistics Subcommittee Chair.

5.2 **Conferences:** In addition to the conferences listed in the agenda, Malgorzata Dubiel reminded everyone of the CMESG meeting, May 29 – June 3, 2003 at Acadia University in Wolfsfield, Nova Scotia; the NCTM Western Regional Conference, November 20 – 22, 2003, in Edmonton, Alberta; and the CMS Winter Meeting, December 7 – 9, 2003 in Vancouver. Frank Gruen announced a Statistics conference entitled: Making Statistics More Effective in the Schools and Business, which is being planned for June 17 – 21, 2004 at BCIT (details at msmesb.org).

5.3. **Announcements from Neil:** Neil made several announcements regarding logistics for this year's meeting.

6. ADDRESS: The effects of high school curriculum changes on first-year math courses: reflections from the Changing the Culture conference – Dr. Malgorzata Dubiel, SFU

Malgorzata Dubiel began by giving a brief history of the annual Changing the Culture Conference and the second Canadian Mathematics Forum on Education in Math which was held in Montreal, May 16 – 18.

The theme for this year's Changing the Culture Conference, held May 2 at SFU's Harbour Centre, was**:** *The effects of high school curriculum changes: Do we need to teach algebra?* There seemed to be no doubt that we should be teaching algebra, however there was a broad perception that current students are not as well-prepared for mathematics courses at university as they once were. A number of reasons for this were suggested, including: over-reliance on calculators, the poor transition from PM 11 to PM12, semester systems which do not allow enough time to cover PM12 material, and the new Statistics component in PM12 which takes time away from algebra and geometry topics. (There was a suggestion that Probability and Statistics be a separate course in Grade 12.) The difficulty of obtaining an objective measure of whether or not students really are less prepared now than before was addressed. Using university averages from year to year is not useful due to the practice of scaling grades. Details of the conference can be found at www.pims.math.ca/ctc.

The Forum on Math Education addressed issues of curriculum, teacher preparation, and public perceptions of mathematics. Similar problems seemed to be shared across the country. Quebec leads the way in both academic performance of its students and in the amount of mathematics included in their teacher preparation programme. We have much to learn from their example. The value of developing good attitudes to mathematics right from the elementary level needs to be recognised, and Math for Teachers courses may need to be revised to ensure that they sow the seeds of enthusiasm, and inspire teachers to seek continued professional development. Curriculum issues also need to be addressed, including deciding exactly what students need to know before studying calculus. Planning for the next Forum in 2005 is already underway. Details of this year's Forum and the resulting recommendations can be found by clicking on Canadian School Mathematics Forum on the CMS website: www.cms.math.ca.

7. MATHEMATICS AND STATISTICS SUBCOMMITTEE – Parallel Sessions

First-year Calculus Session

Math1. Are secondary students' math skills declining? The results of two surveys will be presented – Wayne Matthews.

Wayne Matthews reported on his survey of subscribers to the BCCUPM listserv, as well as the results of a report by Lorraine Baron, presented at the Changing the Culture conference, entitled "Teachers' Concerns about Declining Algebra Skills". Both concluded that there is a strong perception that the skills of secondary math students are declining. The discussion which followed touched on a broad range of related issues including: the cause of this perception and/or the actual decline in skill level, the purpose of PM12, which students are being most adversely affected, and how we can address the problem.

It was suggested that the perceived drop in skill level is possibly the result of higher expectations. Richard DeMerchant pointed out that no concrete objective study has yet been done to support the anecdotal findings of the surveys presented. Others echoed the findings of the studies, pointing to a marked decline in students' ability to work with fractions, lack of geometry skills, and dependence on calculators as both indicators and causes of their weakened ability to deal with first-year Calculus.

Clarification of the role of PM12 was sought. If it is principally intended for students moving to Post-Secondary, then we need to ensure that it can meet its goal. Richard DeMerchant explained that PM12 is intended to ease transition between secondary and first year Math & Science, however it has evolved because of parental pressure to make it applicable to real life. There seemed to be general consensus that the students who were being most adversely affected were the students in the middle. The top students would succeed regardless, and the weaker students do not continue to post-secondary mathematics courses.

Discussion of what we can do to address the problem was begun, with some recommending more data collection over the next few years. Some felt that it was too soon to react given a number of other factors that are currently going on that may be affecting the delivery of the current curriculum including: cutbacks in the schools, the

closure of schools, and the ageing teacher population. Others expressed the view that if we see a problem right now, we shouldn't wait to fix it.

Math2. Effects of the changes to PM 11 & 12 on students in first-year math courses: how can we best respond? – Dave Murray

The discussion begun under Math1 was continued. Dave Murray commented that we have only had one cohort come through and that it may be premature to start changing entry requirements or adding courses. The problems may be with other factors, not just the curriculum. Both Richard DeMerchant and Dave Ellis (of the BCAMT) agreed that it was too soon blame everything on the new curriculum. Richard also informed the group that a Curriculum Review was underway and input from the post-secondary institutions regarding their needs was being solicited.

Not all agreed that we should wait and do nothing. Suggestions for responses were aimed mainly at curriculum, teacher preparation, and student attitudes.

At the curriculum level, post-secondary institutions could raise pre-requisites for entry to Calculus, requiring students to take a Precalculus course. If changes to the high school curriculum are made they should address concerns that there is too much material in the PM12 course. In the meantime we should communicate with the high school teachers and let them know what topics we see as most important for students to make the transition to Calculus.

Teacher preparation issues covered both pre- and in-service opportunities. There was universal concern that students may not have a mathematics teacher who has a good mathematics background until the grade 10 level, or later. Many teachers feel that their background is not strong enough, especially for the Statistics portion of the PM12 course. The suggestion was made that we, as post-secondary teachers, make an effort to go into the schools to give talks to enrich the math experiences of school children and create links with teachers.

Student attitudes were another concern. Students expect to succeed without much outside effort and are not learning how to do homework in school. Post-secondary institutions need to acknowledge this and be prepared to teach students the necessary study skills and appropriate attitudes.

Math3. Linear algebra and the use of software – Roger Coroas

Roger Coroas presented the results of his survey of Linear Algebra courses which focused on course content and technology use. Although there were a significant number of common topics covered, there were notable differences, particularly with respect to applications. Technology use varies considerably, with 7 institutions reporting no technology use at all. Roger described Langara's programme which has a separate Lab course associated with the regular Linear Algebra course. This Lab course focuses mainly on applications.

Discussion of some of the challenges of the Linear Algebra course followed, including when to begin introducing the more abstract ideas, and how to deal with the large amount of material. Some suggestions for dealing with time issues included: splitting the course into two, raising pre-requisites to include a course that gives an introduction to proof or deductive reasoning, and cutting or moving applications to a separate Lab course. There seemed to be no strong desire to define a Core Linear Algebra Course at this time. Although some institutions thought it would help them decide what they could cut, others were satisfied with their current transfer agreements and did not see a need. Standardisation might also be difficult given that some institutions offer 2-course streams for Linear Algebra, while others have just one course.

In response to a query from Roger, institutions that do not use technology in their courses reported a number of reasons for this, including: large class sizes, lack of time in the course, and lack of development time for the instructor.

Math4. Conclusions and Recommendations for the Plenary Session

Discussion focussed on teacher preparation issues, in particular the concern that Mathematics is not being taught by Mathematics specialists. Richard DeMerchant reminded the group of the report of the 1999 Task Force on Mathematics. It had put forward several recommendations, but to date not all have been acted upon. He suggested that the BCCUPM take another look at this. There was some discussion about the appropriate audience for any recommendations offered by the BCCUPM. Jim Totten volunteered to formulate a motion to be brought forward at the plenary session.

Statistics Subcommittee Session

Stat1. Institutional reports.

SFU - Larry has introduced a new case-studies course, STAT 100, had 100 students; text Tanur: Guide to the Unknown. Many applications – designed to attract students into the subject. SFU has made many changes to its Statistics courses (document will soon be up at www.stat.sfu.bc.ca)
LANGARA - steady enrolments; much pressure on waitlists; looking for a suitable text for the two semesters of business stats; faculty member working on 1-credit Excel course to fit the new SFU BUEC 232 transfer requirement.
BCOU - The intro stats course, formerly Math 102 has undergone a major revision to Stat 102 with text: Chance encounters and data analysis by Seber and Wild and with the inclusion of CAST (Computer Aided Statistics Teaching program) and Minitab. Two statisticians tutoring the course.
SELKIRK - low enrollments in main-stream stats (2-hr lab factor in low enrollment); difficulty in making the labs useful)
DOUGLAS - has dropped the ball in Stats. The Math Dept has one Stats course; Stats taught in other Depts (Business, Psych, etc.); jurisdictional issues.
KWANTLEN - 3 Stat courses; BUEC 232 in SFU no longer requires Calculus prerequisite - people do not like the change (new SFU course seems weaker).
BCIT Academic Studies - does not articulate its courses with colleges and universities since the courses are designed for BCIT programs. Requests for credit done on a course by course basis as to whether it fits the program or not.
BCIT School of Business - The School of Business runs its own Statistics Dept - 800 take intro business stats in their 1st year (C+ or better in Math 11 to get into the School of Business). Stats course Excel-based, 4 hours per week for 15 weeks, one hour per week of Excel lab. 1st week - demographic questionnaire which gives a database of 800 students. The School does not go outside for transfer credit but has sought articulation with accounting bodies.
CAPILANO - Dept of Mathematics and Statistics but the stats courses have a MATH designation. For the intro stats Math 101 (Math 11 prereq) have developed their own text, use TI 83 in class and on projector. The follow-up stats course MATH 102 has been dropped due to low enrolments. The stats with Calculus prereq, MATH 204/205, has weekly Excel labs. Point of aggravation that the Stats course in the Bus Admin Department has transfer credit to SFU BUEC 232 but the STAT 204 from the Math dept does not! Stats courses taught in Psych department, Music Therapy, etc.
COTR - University Studies Department has 2 stats courses. The intro stats has a PM12 prereq and has weekly Excel labs. The Math 206 has a Calculus pre-req. Thinking of a 3rd Stats course for students bound for Univ of Calgary or Univ of Alberta (they need ANOVA to transfer).
UCC - Math 120 has a Math 11 prereq for tourism, accounting, sociology. Many programs have their own stats (Biology, Sociology, Social Work - students can get 3rd-year credit for their intro stats). The Stat 200 has a Calc prereq for Science students, 4 hrs (3 lecture, 1 lab). They have taken away the Mathematical statistics prereq for the experimental design course. Reviewing the degrees that have been inherited from UBC. Students only allowed to take 2 stat courses for the Math degree. Considering a degree with an applied Stats major and a Stats and Econometrics degree.

Summary of points from the reports:
1. Jurisdictional issues. It is a fact of life that Statistics courses are taught in departments other than Departments of Mathematics and Statistics.
2. Enrollments impacted on whether there is credit for the lab component (4 hours of lecture/lab but transfer only given for 3 credits)
3. New, exciting introductory course, STAT 100 at SFU (for details see GOTOBUTTON BM_1_ www.sfu.ca/~weldon)
4. Smaller institutions have few stats courses and few statisticians dedicated to teaching the stats courses.

Stat2. Effect of the changes of PM12 on our courses.

From the discussion and from the responses from the Stats listserve, little or no change has been observed in the intro stats courses. Many of our students do not come with PM12 and it seems that the stats in PM12 address formulas and recipes whereas we emphasize meaning, description and interpretation. Agreed that it was a bad strategy to add probability and stats to PM 12. There were also concerns about teacher preparation and readiness to teach the probability and stats component of PM12. The following motion was unanimously carried:

That the Statistics Subcommittee of the BCcupm strongly recommend that
1) The probability and statistics component be removed from PM12 and
2) the Ministry of Education develop an alternative method to integrate Statistics in the school curriculum.

Stat3. Advanced topics in intro Stats courses.

Larry promoted the idea of putting in topics that are considered advanced (for example, smoothing techniques) but are really quite simple to carry out. The traditional thinking is that we have to start at square one and build in a logical way but the greater need is that of engaging the students. So it makes sense to put in the interesting applications at the beginning.

Stat4. Other Stat courses in college offerings.

Various topics were put forward
- a course in statistical packages, their use and interpretation of output
-quality control
-lower level experimental design course
-technical reading course

The expansion of Stat offerings at small institutions is dependent on the availability of resources, the willingness of faculty to develop the courses, and on how well the client departments are served.

Stat5. Use of statistical software.

There was a huge variation in practice in stats courses from calculators, graphing calculators to stats software package. Much discussion on whether a software package is needed in an intro stats course.

Finally, Frank Gruen of BCIT was nominated and acclaimed Chair of the Stats Subcommittee starting September 1,2003.

8. BRIEF REPORTS FROM THE FIRST-YEAR CALCULUS AND STATISTICS SUBCOMMITTEE SESSIONS.

Susan informed the group that the BCCUPM had met in Nelson twice in the past, at Notre Dame University, in 1969 and 1973. David Leeming and Leo Neufeld were both at the ’73 meeting.

Statistics Subcommittee
Veda summarized the discussions from the Statistics Session.

Given that currently there is too much material in the PM12 course, and that there is a goal to raise the consciousness of statistics as a separate discipline, the following motion was put forward.

Motion: moved by Veda Abu-Bakare and seconded by Larry Weldon.
that the BCCUPM, on the recommendation of the Statistics Subcommittee, strongly recommend that 1) the Probability and Statistics component be removed from Principles of Math 12; and 2) the Ministry of Education develop an alternate method to integrate statistics in the school curriculum.
Carried with 1 opposed. (Richard DeMerchant)

Richard DeMerchant noted that the NCTM standards endorse the study of data analysis (which includes Probability and Statistics) throughout the Mathematics curriculum (including Grade 12).

Mathematics Subcommittee

Wayne Matthews summarised the discussion from the portion of the Mathematics section which focussed on student preparedness. He noted the concern and general agreement that algebra skills are deteriorating, fraction skills are weak, and students are overly dependent on calculators, but that it may be premature to make recommendations. Some of the issues revolve around curriculum and can be addressed through the Ministry of Education's imminent curriculum review.

Discussion followed regarding how best to respond to the current situation, in particular regarding teacher preparation issues, and to whom the BCCUPM should direct its concerns. It was suggested that a task force be created to review the Report of the 1999 Task force on Mathematics. Possible recipients of any such review could include the Ministry of Education, Education Faculties at the universities, and the BC College of Teachers. Concern was also expressed over who should undertake the review. It was noted that it would be helpful to have a representative from Math Education attend the BCCUPM meetings.

A series of motions resulted from the discussion.

Motion: moved by David Leeming and seconded by Bruce Kadanoff
that the BCCUPM strike a small committee to review the '99 Report, to study the recommendations that have not been implemented, and report back at the May 2004 BCCUPM meeting. Carried.

Motion: moved by Neil Coburn and seconded by Jim Totten
that the BCCUPM recommend that the Ministry of Education strike a task force to review the mathematics preparation of teachers, and in particular to review the recommendations of the 1999 Task Force on Mathematics and report back to the chair of the BCCUPM. Carried unanimously.

Motion: moved by Neil Coburn and seconded by Jim Totten
that the BCCUPM recommend that the BC College of Teachers strike a task force to review the mathematics preparation of teachers, and in particular to review the recommendations of the 1999 Task Force on Mathematics and report back to the chair of the BCCUPM. Carried unanimously.

Motion: moved by Jim Totten and seconded by Bruce Kadanoff
Given that many (or most) elementary schools in BC currently have specialists in French and Music, and given that many BC elementary school teachers do not have expertise and/or interest in mathematics, the BCCUPM recommends that school districts begin to create Mathematics specialists for BC schools starting in grade 4. Carried (with 1 abstention: Richard DeMerchant).

As a first step, districts could survey current elementary school teachers on their preferences in subjects to teach. Then, as far as is practical, teaching assignments should be given based on these preferences. This change likely would encourage more people proficient in mathematics to gravitate to teaching elementary school.

To conclude this session, Susan Milner briefly described the Linear Algebra discussion.

The Thursday Session of the BCCUPM adjourned at 4:25 p.m.

BCCUPM and Secondary School Teachers Session

THURSDAY, MAY 22, 2003 (late afternoon)

1. Introductions and Opening Remarks.
Susan Milner welcomed Nicol DeVocht from Nakusp Secondary School.

2. BC Colleges High School Mathematics Contest Report – Clint Lee (see attached report, page 24)

3. BC Universities Calculus Challenge Examination – Rustum Choksi

Rustum Choksi reported on the BC Universities Calculus Challenge Exam which was coordinated by SFU this year. Approximately 220 high school students wrote the exam in each of 2000 and 2002, with respective averages of 60% and 63%. A passing grade in the exam translates into credit for Calculus I with the corresponding letter grade at any of the four participating universities: SFU, UBC, UVIC and UNBC. Graphing Calculators are permitted.

4. General Discussion:

a) How changes to Principles of Math 11 & 12 are affecting the transition from high school to post-secondary mathematics and statistics courses.

Nicol DeVocht reported that her students seemed to be doing well in making the transition from high school to university, and expressed interest in learning about anything that could be done to make the transition easier. Some discussion followed regarding the number of students who take Calculus in high school. Richard DeMerchant reported that roughly 22% of students in the province who are taking PM12 are also taking Calculus in some form.

b) The elimination of provincial Grade 12 examinations

Richard DeMerchant reported on the Ministry's new provincial examination schedule. All grade 12 exams will be optional except for Language Arts 12. There will be a standard compulsory Math exam in grade 10. Discussion followed revolving around whether this will affect articulation between the high schools and post-secondary institutions. Some institutions do not accept students into first-year Math courses without a provincial final score and will continue to do so. There was a suggestion that it might be useful to have a province-wide Math Assessment, like the LPI for English. Given that the Math 12 Provincial Final is optional, and that many post-secondary institutions either do, or will require it, concern was expressed that students might not be given the right advice in high school about whether or not they should take it.

5. Other topics

6. Adjourn to Reception.

The session adjourned at 5:42 p.m.

FRIDAY, MAY 23, 2003

1. INTRODUCTION OF REPRESENTATIVES AND OPENING REMARKS.

2. REPORTS

2.1 B.C. Council on Admissions & Transfer – David Leeming

David gave a summary of the latest news from BCCAT. Four meetings were held this year: two at the BCCAT Office at BCIT downtown Vancouver, one at CNC in Prince George, and one at the Institute for Indigenous Government in Vancouver.

BCCAT has been given additional funding to hire a second Associate Director. With this new position it will be able to expand its initiatives into the admissions area (always part of its mandate), particularly issues of transition from secondary to post secondary. Raymond Bendall, the person contracted to keep the electronic BCCAT Transfer Guide up-to-date suffered a severe stroke earlier this year, and his work is being done on contract temporarily.

David reminded the group that TIP (Transfer Innovation Project) and TAP (Transfer and Articulation Project) funding continues. About 28 projects have been funded so far including the Core Calculus Project. There are new rules in place to ensure deliverables are on-time and on-budget. Those wishing to create articulation websites containing pathways for students must ensure that updates can be guaranteed with no cost to BCCAT.

The Quality Assurance Board has been established by the BC Government and replaces the old DPRC. It will be the body that assesses private institutions prior to them being able to request transfer credit from any BC College, University College, or University. The new Board is probably going to receive about 20 applications from private institutions for transfer credit in the next year. Two members of the BCCAT are on the new Quality Assurance Board.

A study is being undertaken by BCCAT, on contract, to determine the total cost of articulation in BC. The Study will consider department and central costs plus the BCCAT costs. This is a first step to a possible charge for articulation to private post secondary institutions. A charge may not be levied, but it is useful to know what the total costs of articulation are.

2.2 PIMS – Changing the Culture 2003, the rest of the conference – Wayne Matthews

There was little to add to Malgorzata's summary of the conference during her presentation on Thursday. Wayne mentioned that the talk entitled "Hollywood Perceptions of Mathematics: Cultural Truth or Mathematical Fiction" given by Rina Zazkis and Peter Liljedahl was particularly interesting.

2.3 Ministry of Education – Richard DeMerchant

a) Revising the Western and Northern Canadian Protocol (WNCP) framework

Richard began his report with an oral quiz, asking questions on graphing calculator use, education levels of mathematics teachers, and on extra math support for strong or weak students in BC Schools. He recommended the SAIP as an excellent source for informing our understanding of the state of Mathematics education in BC schools in relation to other provinces. (The web site for SAIP is www.cmec.ca/saip.) He noted that many look at BC as one of the leaders in mathematics at all levels.

Richard reported that a survey of post-secondary institutions has begun in order to determine appropriate revisions to the WNCP framework. (Currently the framework is being used in BC, Alberta. Saskatchewan, Manitoba and the northern territories, with differences between the programmes in the different regions more pronounced at higher grade levels. The use of common resources helps ensure that the curriculum is being followed.) UNBC, UVIC, SFU, and UBC have been contacted so far. A wide variety of areas, including Mathematics, Science and Humanities Departments are being consulted in the review process. The university colleges and colleges will be approached next, but the research team will not be able to visit all of them.

Richard distributed a copy of the survey and encouraged the members of the BCCUPM to participate. Responses can be submitted by individuals or groups, and should be in by the end of October or beginning of November. Richard will send a digital version of the survey to the BCCUPM listserve.

b) Graduation review and changes

The changes to BC's graduation requirements are posted on the government website at www.bced.gov.bc.ca/grad_req_rev.htm. The implications of having Provincial Exams at the Grade 10 level have not yet been worked out. Comments and questions can be submitted through links available on the website.

2.4 BCAMT – David Ellis

1. Professional Development: 42nd Northwest Conference at Whistler on Oct. 23 – 25, 2003. "Mathematics—A Peak Experience"
2. Curriculum: Mathematics 8/9 IRPs were implemented in September 2002.
   Essentials of Mathematics 12 – This course is to begin in September '03 with student texts ready in August.
   FSA Numeracy 10 – This was the last year for this component of the grade 10 assessment. It will be replaced with 3 final exams (PM, AM, EM) each worth 20%. Field test in June '04; to begin Jan/June '05.
3. Graduation Document: The BCAT formulated and submitted a response to the Grad Review (see http://www.bctf.bc.ca/bcamt/documents/Grad.pdf). The executive is sending a response to the final form of the Grad Document proposals approved April '03. The BCAMT will be discussing the possibility of producing a position statement on final exams.
4. K – 12 Vision: BCAMT Executive is looking at directions for BC math education as a long-term plan. This is to be OUR Standards. It is to be a long-term plan; pro-active, rather than reactive. It is starting with 10 key issues – content, pedagogy, technology, assessment, teacher training, professional development, equity, numeracy, societal attitudes, and politics. The time line is to include a first draft (Jan. '04), a second draft, a working draft, focus groups, and a final product (Fall '05 Conference).

Heated discussion followed. Most institutions would not be comfortable accepting students without a provincial final exam, while others were less concerned.

Report from the nominations committees:

Veda Abu-Bakare and Larry Weldon nominated Frank Gruen for the position of Chair of the Statistics Subcommittee and he was appointed by acclamation. His two-year term will begin on September 1, 2003.

Leo Neufeld and Roger Coroas nominated Jean Mcleod for the position of Secretary to the BCCUPM and she was appointed by acclamation to another two-year term.

Jim Bailey and Natasha Davidson were nominated for the position of Vice Chair of the BCCUPM. Ballots were distributed.

Slava Simice announced that a second AMATYC representative was needed. Ken Towson indicated that he was willing to serve.

2.5 ABE – Barb Coombes

Since the BCCUPM meeting is at Selkirk College, I have been asked to represent the ABE Math Working Committee. Our group met at Douglas College, New Westminster on March 13 and 14, 2003. The highlights of our meeting are as follows:

Advanced Business and Technical Math: New learning outcomes were developed last year for this course. In addition, course material we have been developing over the last several years is nearing completion. This course is an alternative for students who wish to complete the BC Adult Graduation Diploma and require a math course at the advanced level.

Advanced and Provincial Level Math Outcomes: Our committee has revised the outcomes for Advanced Algebraic math and is working on the revisions for Provincial Math. The committee has accepted the Advanced revision and all member Colleges have until next year to resubmit their revised course outlines. A group has also been formed to revise the learning outcomes for Provincial math but as yet no information is available on the revisions. It is hoped the new outcomes will be included in the 2003/3004 ABE Articulation Guide, published in September.

Advanced/Provincial Level PLA Exams: Students wishing to receive PLA credit for Advanced or Provincial math courses can find resources and challenge exams at the BC ABE PLA website: www.ucfv.bc.ca/abepla. The material found on this website offers a very good review of both Advanced and Provincial math courses.

Provincial Level Calculus: Learning outcomes for a Provincial Level Calculus course were presented and accepted by the Working Committee. This is a new course, which is similar to the Calculus 12 course developed by the MoE. Provincial Calculus is meant as a bridge course from Provincial Math to 1st year Calculus. Two colleges, Yukon College and VCC, will be offering this course in the fall. Attached are the leaning outcomes for Provincial Calculus as accepted by the Math Committee. With the introduction of the new Calculus course, it became necessary to differentiate between the two Provincial courses. The Algebra course will now be listed as Provincial Level Algebra and Trigonometry, with the Calculus course listed as Provincial Calculus.

ABE Articulation Handbook: This handbook, which has been published in hard copy for as long as articulation has been going on, will now only be available on the AVED web site. The guide is in PDF format and can be downloaded in whole or in part. The website is: www.aved.gov.bc.ca/abe.

Election of New Co-Chairs: The Math Working Committee elected Costa Karavas from VCC and Robert Ferro from Yukon College as the new co-chairs. Betty Drury from Capilano College accepted the position as Vice-Chair. The positions are for a 2-year term with the option of a 1-year extension.

In addition, Barb reported that the ABE Advanced and Provincial Level Math courses do not exactly match the content of PM11 and 12. They do not cover the Statistics portion and have not moved polynomials from Grade 12 to Grade 11. Meetings with the Ministry have been cancelled twice, but given that their target audience is students who hope to go on to colleges and universities, the ABE group is happy to leave their courses the way they are.

She also noted that despite the "tuition-free" status of ABE courses, some institutions are charging fees.

Leo Neufeld announced that Jim Bailey had been elected as Vice-Chair for a two-year term.

Motion: moved by Leo Neufeld and seconded by Roger Coroas
that the ballets be destroyed. **Carried.**

3. BUSINESS ARISING FROM THE MINUTES OF THE 80TH MEETING

3.1 Core Calculus Curriculum – Leo Neufeld

Leo reported on his follow-up survey on the Core Calculus Curriculum. Two recommendations came out of his report: a) that the BCCUPM routinely make the status of the Core initiative a discussion item at its meetings; and b) that a study be undertaken to determine the system-wide level of interest in the development of core curricula in specific first-and second-year mathematics/statistics courses.

Discussion of the recommendations followed.

Motion: moved by Jim Totten and seconded by Mohammad Chabi
that the BCCUPM accept recommendation b).

Carried (3 against, 1 abstention).

Those who spoke against didn't see a need for the establishment of core curricula for other courses at this time.

Neil Coburn offered to collate the responses from the institutions and requested responses by September 30.
It was felt that the core curricula would naturally become a topic for discussion at our meetings making Recommendation a) unnecessary. The full report can be found on the BCCUPM website.

3.2 Math Assistance Centres: a cost-recovery model – Susan Oesterle
Susan Oesterle reported on the current situation at Douglas College regarding their Math Assistance Centres. Due to funding cutbacks, their math tutor positions were cut from the college budget. In order to continue to provide math assistance they will be forced to charge Math students an additional Math Lab Fee beginning in the Fall semester. Students should be able to expect greater access to service, improved facilities, and in many cases, scheduled tutorial time. The Mathematics Faculty regret having to pass an additional financial burden onto the students, but are hopeful that the restructuring will have a positive impact on success rates.

3.3 Associate Degrees: specialized ASc(Math) or ASc(Statistics) degrees might allow us to develop block transfers into third-year – Neil Coburn
Neil Coburn asked the committee if there was any interest in defining a 2-year programme in mathematics to guarantee student acceptance into third-year at universities, and if so, how BCCAT would respond. David Leeming indicated that as long as the programme fit within the framework for Associate Degrees, BCCAT would have no objections. Universities would also accept a well-designed programme, just as they do for other specialities.

Associate Degrees have become increasingly popular because students who have them can be admitted to university with lower entry-GPAs. Larry Weldon informed the group that the gap in the required GPA for those entering with or without an Associate Degree will be narrowed to 0.25, making the Associate Degree less desirable than it has been to date.

Some colleges expressed an interest in establishing an Associate Degree in Math, but there was acknowledgement that very few students would be affected. Most colleges would have difficulty offering key courses (Analysis in particular) for lack of students. There was some suggestion that colleges could cooperate and take turns offering such courses. Bruce Kadanoff noted that private colleges are not permitted to offer an Associate Degree credential.

Neil Coburn offered to coordinate the drafting of an Associate Degree in Mathematics. Committee members were asked to email Neil with suggestions for what such a programme would require.

4. INSTITUTIONAL/ARTICULATION BUSINESS

4.1 Reports from Institutions

- **BCIT –**Colin Lawrence(Technologies)
  In the past the Mathematics Department at BCIT has not articulated any of their courses. However, this will probably change within the next year.
  The underlying reason for this change is the increasing emphasis given at BCIT to Bachelor of Technology degree programs. These degree programs typically build on two years of post-secondary courses that the B.Tech. student has previously taken. These two years could have led the student to a Diploma in Technology or an associate degree or two years of post-secondary courses taken at either a college or university. Rather than have the student take these first two years at another institute the possibility of offering an associate degree or two years of acceptable courses at BCIT is being evaluated. Included in any acceptable bundle of courses will be first-year calculus courses. Our department has designed course outlines for Calculus 1 and Calculus 2 based on the First-Year Core Calculus document. We will be seeking to articulate these courses with the equivalent courses at the Universities and Colleges of British Columbia.
  I would like to express my thanks to the First-Year Core Calculus Committee for their work.

- **CAMOSUN** – Fred Hughes
  This September we are introducing a new "Algebra & Precalculus" course for those with less than a B in Math 11. It is comprised of our usual Precalculus course plus some "just in time" review.

Camosun College is currently undergoing a reorganization that will likely see a new math department comprised of ABE Math and the current Math department.

Associate Degrees are being actively promoted. Since an AD Arts requires a UT Math we find many more students taking either Business Statistics or Math for Elementary School Teachers.

At Camosun College, the chairs have been instructed to not allow regularization of term faculty in order to save money. We are told that this efficiency is needed to fulfill the BC government's expectations of more seats for less dollars and to better combat future competition from private colleges. We are concerned that this will make it more difficult for us to attract top quality faculty.

- **CAPILANO** – Ken Towson

Ted Bentley sends his regrets, but coordinator duties require his attention at Capilano. The Mathematics and Statistics department is currently completing a search for Non-Regular instructors for Fall/Spring. We have recently received confirmation that Rick Brewster, who has been on leave at Bishop's University in Quebec, has officially resigned from Capilano and has accepted a position at U.C.C. He will be sorely missed.

We are very pleased to have a new Dean of Arts and Sciences, Dr. Penny LeCouteur from our own Chemistry department, who has just had published an incredibly interesting book called Napoleon's Buttons (available at all major booksellers...). The college is encouraging faculty to experiment with the offering of "mixed-mode" courses, approximately half in-class instruction and half online activities, and have offered the amazing release time of one-third of a teaching section for the development of each course.

We hope to soon be offering an Associate Degree with specialization in Mathematics (or Mathematics and Statistics, or Mathematics and Computing, etc.)

- **CARIBOO** – Jim Totten

1. The department has joined a new school – the School of Advanced Technologies and Mathematics. A permanent dean is just being appointed and we hope that this will lead to new opportunities, particularly in cooperation with the Department of Computer Science, who are also in this new school.

2. Jim Totten and Bruce Crofoot started work in January as Editor and Associate Editor respectively for *Crux Mathematicorum*, a journal of the Canadian Mathematics society.

3. Jack Bradshaw and Don DesBrisay retired and have come back in a shared position. This created a new position which has been filled by Dr. Rick Brewster, from Bishop's University and Capilano College.

4. There will be one 9-month and one 4-month sessional positions in our department next year.

5. Jim Totten is selecting problems from his "Problem of the Week" series to be printed as a short monograph by the Canadian Mathematics Society in their ATOM series, with all proceeds to go to the Canadian Mathematical Olympiad team.

6. Jim Totten is presently compiling sets of assignments and solutions originally developed by John Ciriani for Calculus I through Calculus IV. At present Calculus III is essentially complete. Work is continuing on Calculus I and II, with Calculus IV still some in the future. This resource will be available for others to use. It will consist of a published set of assignments and answers for each course, together with a full set of solutions that can be released in a timely manner (e.g., using WebCT). Currently Calculus III has 18 assignments and 12 supplementary assignments (for deeper understanding); each assignment is one page in length. The full solution set is 143 pages!

- **COLLEGE OF THE ROCKIES** – Jim Bailey

College of the Rockies currently plans to offer the same courses that it did last year. We have been warned that we may lose our first year Computer Programming courses due to low enrollment. These courses run 3 hours lecture + 3 hours labs per week both semesters and we may be able to replace them with mathematics courses; PreCalculus and another first year Statistics course have been suggested. We have also been asked by the high school in Fernie to offer Calculus I online. Their graduates often go to university in Alberta and are currently at a disadvantage without

Math 31 (the high school does not offer Calculus 12). This past year the tutorials to Calculus I and II were taken by a "professional tutor," one of our former students who recently graduated with a B.Sc. in Mathematics from SFU. This has worked out very well.

- **COQUITLAM** – (Bruce Kadonoff)

- **CNC** – Nicholas Buck
  Holding own with respect to enrolment numbers (considering tuition increases and the local economy). New generic technology math course developed (Math 195/196). Running so-called "summer institute" for first time. Courses include Precalculus and Mathematics for Elementary Teachers. Some sections purchased by International Education Department. One sessional and one part-time instructor hired for these (and other) courses. Re-organisation of some divisions caused by difficulties in recruitment and retention (especially) and technology enrolments. UT Arts and UT Science now combined. Dew division of Technology and Planning. Implementing new "Technology Plan". Ran annual High School Mathematics Competition. Good participation and support from local high schools.

- **DOUGLAS** – Susan Oesterle
  The Math Faculty have been extremely busy this year, planning for the restructuring of our Math Labs. We will be hiring four TAs: one full-time 12-month, two full-time 8-month, and one part-time 8-month, to begin in September 2003. There have been no changes to courses or curriculum. Our enrolments have been steady, and we continue to add sections at the lower levels to meet demand. There have been long wait-lists for our Math for Teachers course. As a result we are running a section in the summer, and plan to offer 2 sections in January. Alan Lawson is retiring this year after 33 years at Douglas College.

- **KWANTLEN** – Mike Nyenhuis
  Many new sections of precalculus and calculus were added last year, with the result that it seems that demand for Math courses is finally being met. Precalculus and Intermediate Algebra have new course outlines. Precalculus has not changed that much, but Intermediate Algebra has. Faculty seem reasonably satisfied with the new Intermediate Algebra.

- **LANGARA** – Roger Coroas
  1. There was an increase in the number of courses offered in 2003-2003 due to the increase in student enrollment at the college.
  2. Math for Elementary Teacher (Math 1190) has been successfully offered every term, with long waiting lists. To obtain transferability a prerequisite change was necessary. The new prerequisite is: "Principle of Math 11 with a C within the last 3 years, or Applications of Math 12 with a C within the last 3 years, or Principles of Math 12 with C- within the last 3 years, or Langara Math 1101 with S, or an appropriate score on MDT Test #1."
  3. We will be reviewing our precalculus course structure and, as a result, these courses might get redesigned.

- **MALASPINA** – Ian Bailey
  Next year we will offer four upper-level courses: Number theory, Graph Theory, Probability, and an Applications course.
  Our math learning centre staff member (Jane Neilson) will be on leave for three years. To replace her we will experiment by hiring a team of perhaps six or more of our best math students as work-study students. They will attend weekly review sessions of the main math homework assignments, and will be circulating among the students in the main study area as well as staffing a dedicated centre.
  There is a full-time temporary position available for next year, and one or more in addition for the spring semester. Other than these changes for next year, and a growing intersession (six math offerings this summer), everything is status quo.

- **NORTHERN LIGHTS** – (Mohamed Chabi)

- **NORTH ISLAND** – Slava Simice
  Due to the low enrollment in the second year math courses, it has been decided that these courses will be available on alternate years. In the year 2003/2004 we will offer Finite Math and Calculus for Life Sciences on Comox Valley Campus instead of Linear Algebra and Calculus III. Finite Math and Calculus for Life Sciences have been offered so far on Campbell River Campus only.

For the first time we have hosted a BC Colleges High School Mathematics Contest. The contest was a big success. The highlight of the contest was famous mathematical presentations by Jim Totten. Almost 350 students from eight Junior, Middle, and Secondary Schools in the North Island College region participated in the Preliminary Round, with 44 students being selected to participate in the Final Round.

- **NORTHWEST** – Mona Izumi
  It was business as usual at NWCC. We continue to offer Calculus I and II at both the Prince Rupert and Terrace centres. Though our numbers are small, enrolments remain constant. Introductory Statistics is offered at Prince Rupert, Smithers, and Terrace.

  A new initiative for the past year was an online offering of Mathematics for Elementary Teachers through BC Campus. I spent the summer as well as the fall semester developing the course and it was offered for the first time in January. Most of the students were from within our college region, however, I did have three students from other parts of the province. Face to face classes will continue to be offered in Terrace but the plan is to offer the online course at least once a year.

  NWCC now offers an Associate Degree in Criminal Justice. This will mean a few more students who will need Intro Stats.

- **OKANAGAN** – Clint Lee

  1. In the 2002/03 academic year, the Mathematics & Statistics Department has made the following curriculum changes:
  - Renumbered two second year courses as third year courses: Math 226 becomes Math 319 – Analysis I and Math 211 becomes Math 311 – Abstract Algebra I.
  - Deleted Math 119 and Math 129, the two mathematics courses for the Computer Information Systems Programme and introduced Math 139, a one semester course for this programme. CIS students will now take Math 139 and Cosc 221/Math 251 – Introduction to Discrete Structures. Note that the cross listing of Cosc 221 and Math 251 is also a new development.

  2. In 2003/04 academic year the Department will offer the following upper level courses for the first time:
  - MATH 408 Differential Geometry
  - MATH 425 Algebraic Topology
  - STAT 406 Environmental Statistics

  3. The Department is currently developing two new upper level courses:
  - Coding Theory: [Dr. Wayne Broughton]
  - A third Number Theory course: [Dr. Blair Spearman]

  4. The Department has obtained funding for and has initiated the development of a parallel computing facility, a Beowulf Cluster, which is now operational. The cluster consists of 8 new PC's that are physically situated at the Penticton campus, however FTP access is available from any site.

  5. The Department continues a strong research agenda in its recruitment. Dr. Javad Tavakoli, an NSERC grant holder, was hired on a three semester contract to replace Phil Beckmann who is now Associate Dean of Science. Dr. Rebecca Tyson was hired with the help of a federal UFA, [University Faculty Award]. The award gives the institution $40,000 per year for a maximum of 5 years. Rebecca was also given an NSERC grant. The Department now has 7 NSERC grant holders.

  6. The Department, on the initiative of Dr. Sylvie Desjardins, has received seed money to create a "Centre for Mathematical Biology". The centre will serve as an interdisciplinary vehicle to co-ordinate research activity which has a strong Biology flavour and which is also amenable to mathematical analysis.

  7. The Department is currently working with the Biology Department to develop a "Calculus for Biology Students" course.

- **OPEN UNIVERSITY** – Veda Abu-Bakare
  In 2001 the Government of BC began a core review of all provincial programs and services. The Open Learning Agency (OLA) was part of that review, and consequently, in October 2002, the Ministry of Advanced Education announced that OLA's key programs and services would be transferred to another BC public post-secondary institution or institutions within 2 years. In March 2003 a request for Expressions of Interest (RFEOI) was released to all 26 BC public post-secondary institutions for the British Columbia Open University/Open College (BCOU/OC).

  The release of the RFEOI is a positive step forward in the OLA transition process and it has no impact on everyday operations at BCOU/OC. We continue to provide students with the courses and programs they need and the uninterrupted service levels they have come to expect. It is business as usual at the BCOU/OC for staff, tutors and students.

  We express our gratitude to this group for its motion of support for the BCOU at last year's meeting and its follow-up letter to the Minister – we like to think that the Ministry's decisions were tempered by the support expressed by this group and by our students.

  For the Math and Stat courses, the Calc 1 and 2, Math 120 and Math 121 are being updated to the latest (5th) edition of Stewart. Our Intro Stats course (formerly 102) has undergone a major revision to Stat 102, using the Seber and Wild - Chance Encounters and Data Analysis, and using the statistical software package, Minitab. We now have two statisticians tutoring this course. We are about to lose the Calc 3, Multivariable Calculus, as a result of the last round of cuts to our curriculum on the basis of low enrollment for that course.

  Overall enrollments have been steady, both in our courses and our degree programs. We did experience a slight drop in enrolment soon after we had a recent increase in fees but the numbers are steadily building back up and it continues to be business as usual.

- **SELKIRK** – Neil Coburn
  Enrollments
  There has been a decrease in Math enrollments. This mirrors the general decrease in UT enrollments at the College. In addition, the 2003/2004 applications for University Transfer are down about 20% over last year; though the applications for second-year are up slightly. Some of the changes are/were due to changes in other programs: Aviation did not have a first-year intake in 2002/03, Computer Information Systems will not have a first-year intake in 2003/04, Multimedia Production and Design has removed the Finite Math course from its curriculum.

  Courses
  We have had no new courses in the past year. Though one instructor, Melanie Macdonald, did give a revised version of a “Finite Math” course to the students in the Multimedia Production and Design program. You will see some of the results of that course in the workshops on Saturday morning. We are still considering proposals for new math courses: a combining UT and career program Statistics course with "domain specific" lab sections, a second-year Statistics course, one or two discrete math courses, a possible re-structuring of our pre-calculus course. Of course, the effects of the inclusion of Probability and Statistics in the Principles of Math 12 course are still being monitored.

  Faculty

  John Peregrym will be retiring this summer. As you know, he has had a long career at Selkirk College and made many contributions to the College and to mathematics education in B.C. We wish him well as he starts a new era of his life. We have one instructor on LTD and one instructor on a parental leave in 2003/04. This will result in a one-year replacement position and a part-time Winter term position. The College budget is still being finalized but I expect that the Math/Science Tutor position will be maintained next year.

  BC Colleges High School Math Contest
  We had one local high school (J.L. Crowe in Trail) express interest in the Math Contest. Since they had 40 students who were interested, we decided to offer the Contest through Selkirk College for the first time. We were able to raise $1400 in support from the Selkirk College Foundation, the Student Association and KAST (Kootenay Association for Science and Technology) and we received two $500 tuition credits from the College. A dozen students visited the College for the Final Round in early May. We hope that the publicity from this year’s event will encourage interest in more schools for next year.

College Re-organization

In late February, the College administration announced a complete re-structuring of the College. All the academic departments (about 15) were to be eliminated and replaced by 7 Schools. School Directors (members of management) would replace the existing Department Heads (members of BCGEU or SCFA). After some strong opposition and intense negotiating with the BCGEU and SCFA bargaining units an alternate re-structuring was agreed upon. It included 8 Schools, each with a Chair who would be a member of BCGEU or SCFA. As part of this re-structuring the current departments of University Transfer – Arts and University Transfer – Sciences will be combined to form the School of University Arts and Sciences.

- **SFU** – Rustum Choksi(Mathematics)

New Lecturers: We have hired three new lecturers. Veso Jungic (started Dec 2001), Adriana Wise, and Justin Travis Gray (started Sept. 2002). Tasoula Berggren has retired and Jagdish Arya will retire this fall. In addition we are in the process of hiring two additional lecturers. Historically each lecturer has been linked to a workshop servicing a group of first and second year courses. The workshops will remain in place however, the coordinators will rotate on a two year cycle.
The coordinators for the next two years are as follows:
Calculus Workshop, Veso Jungic, vjungic@sfu.ca; Services: Math 151, 152, and 251. Note: Veso is currently trying out the Edwards and Penney on line assignments for these three courses.
Applied Calculus Workshop: Justin Gray, tgray@math.sfu.ca; Services: Math 154, 155, 157, 158 (Biology and Business Calculus Streams). Note: Our 157 - 158 (business stream) is not in sink with the ``Calculus Core'' recommendations.
We will look into ways of bridging the two.
Algebra Workshop: Adriana Wise, awise@sfu.ca; Services: Math 232 (Linear Algebra), Macm 201 (Discrete Math 2), Math 100 (Precalculus), Math 190 (Math for Elementary School Teachers). Notes: (i) In Spring 2003, we introduced a Math 190 correspondence version which seems to be very successful. This workshop also offers a free Assessment Test and a credit-free Basic Algebra course for people who don't have a sufficient grade 11 math background.
(ii) We are currently looking into adopting a different text for Macm101 and 201 (we currently use Rosen).
(iii) We are also trying a new Linear Algebra text for Math 232 (Poole).

Transfer credit: has been done by Malgorzata Dubiel but she will be on study leave next year. It will be assigned to another faculty member.

Other changes to the undergraduate program:
(i) New Applied Mathematics Major and Honors programs (see department web page).
(ii) In the process of making several changes to the upper level courses in discrete math, algebra, and analysis; focusing on a "core stream" of courses which we will require for a new math majors program.

Additional New Faculty: Ralf Wittenberg, Nils Bruin, Jonathan Jedweb, John Stockie

New Chair: Alistair Lachlan will retire this September. Norman Reilly has agreed to be chair until September 04.

FYI:
1) We have, since 1995, been teaching a course Math 198, Explorations in Practical Mathematics, in the SFU Liberal and Business Studies Program. The course requires Principles 11 (Algebra 11) or equivalent as a prerequisite. For those who need it,an intensive summer remedial workshop in basic algebra is offered prior to the course proper. Text: Explorations in College Algebra, by Kime & Clark. The course covers introduction to function and graphing, rate of change,exponential and logarithmic function, exponential growth, sequences and series, compound interest, mortgages, loans and annuities, counting and choices. In addition, the course attempts at selected selected practical applications of mathematics as well as uses, misuses and abuses of mathematics in the media.

2) SFU has introduced some changes to their undergraduate curriculum. As we discussed, our department was not involved
in the initial discussions but is being asked to comment on matters regarding its implementation.

- **SFU(Surrey Campus)** – Julie Tolmie
  Simon Fraser University will establish a School of Interactive Arts and Technology at its Surrey campus and will also offer access to degree programs in business administration and education. As well, the university will provide community outreach and continuing studies courses at the campus.

  The new initiatives come as the result of resolutions adopted unanimously by the SFU Senate at its last meeting, following a year of planning and consultation about the future of the Surrey campus. The recommendations will now go to the Board of Governors.

  Senate also recommended that "SFU should have a continuing presence in Surrey," subject to the provision of adequate capital and operating funding by the provincial government.

  SFU President Michael Stevenson said the unanimity on the resolutions shows a strong sense of confidence in the future of the program. It's an enormously positive sign for the future of SFU, the communities in the surrounding area, and for the province."

  The new School of Interactive Arts and Technology will be a part of the Faculty of Applied Sciences, but Senate called upon all SFU faculties to mount programs at the Surrey campus.

  Brian Lewis, the dean of Applied Sciences, called the Senate resolutions a great step forward for Simon Fraser University and the community. Lewis says the new school will develop joint programs with other schools in his faculty, specifically computing sciences and engineering sciences. This creative alignment of interests and disciplines focusing on technologies and their applications will be unique in Canada. It should be tremendously attractive to students.

- **UBC** – Wayne Nagata
  The main change in the math program between the 2002/03 calendar and the 2003/04 calendar is the computing requirement. The requirement is similar to last year's but reflects changes in the introductory courses offered by the UBC computer science department.

  The following details connected with first and second year courses are not in the current (2003/04) printed calendar.

  1. Math 111 (Elementary Calculus) has been deleted. If students do not have a C+ in Principles of Mathematics 12 they are expected to take the non-credit courses Math 98 or 99 (or both) from Continuing Studies.

  2. Math 120 (Honours Differential Calculus) will now require successful completion of a high school calculus course (in addition to the prerequisites given in the printed calendar).

  2. Math 215 (Elementary Differential Equations I) will now cover the Laplace transform which was formerly in Math 316. (This change makes it more similar to Math 255, which is intended for engineering students.)

  3. Math 220 (formerly named Analysis) is being renamed Mathematical Proof and will place a bit more emphasis on proofs and logic and a bit less emphasis on analysis. This change is not expected to affect transfer credits for students transferring into UBC.

- **UCFV** – Susan Milner
  We have generally maintained student numbers this year:
  - Second-year math courses show a slight improvement, with enrolments in the mid-twenties and a healthy *25/36* in introductory analysis
  - The most popular upper-level math course was the new number theory course which enrolled 20 students
  - The other upper-level math courses enrolled close to 20 students each
  - The online course in introductory statistics is becoming increasingly popular, with enrolments close to 30
  - First-year courses in introductory statistics, in discrete math and in mathematics for elementary ed were all under great pressure so more sections were added
  - Enrolments in the two courses that constitute a gateway to upper-level statistics courses were down from last year

- Upper-level statistics courses were well-enrolled, with close to 20 students in each

In order to inject more life into upper-level discrete math, the discrete math offerings have been de-coupled so that one is no longer a prerequisite for the other.

We are in the process of hiring math faculty: the statistics position has been filled.

The Math centre has become increasingly popular amongst students and the hours of opening have been extended.

- **UNBC** – Lee Keener
Until recently, Mathematics at UNBC has been a joint program (i.e. department) with Computer Science. In part because of growth, especially in Computer Science, the two disciplines decided in late winter of 2003 to separate. The combined unit had been without a regular Chair since July 1, 2002 when Lee Keener stepped down. On April 1, 2003, Sam Walters began his term as Chair, the term ending in the summer of *2005.* The new unit has seven full-time faculty and a number of part-time faculty.

The Mathematics Program has now completed its first year under a curriculum that has been substantially revised. The restructuring of the curriculum was informed in part by the external review conducted by David Leeming (Victoria) and David Poole (Trent). Major changes in the curriculum include

- Splitting the old linear algebra course (MATH 220) into two courses (MATH 220 and MATH 226)
- Collapsing the two semester *Foundations in Modern Mathematics* sequence (MATH 222 and MATH 223) into a single course (MATH 224) with the remaining material placed in the *Theory of Metric Spaces* course (MATH 302)
- The course *Statistics for Social and Health Sciences* (MATH 242) has been removed from the schedule of classes for the foreseeable future. Students will take the Biostatistics course (MATH 342) in its place.
- The advanced geometry course (MATH 470) has been removed from the calendar.
- The applied mathematics courses have been completely revised. In particular, there is a new course *Linear Differential Equations and Boundary Value Problems* (MATH 230) offered every year, and required for Environmental Engineering students.
- Upper division courses in several sub-disciplines are now offered in such a way that a student will be able to enroll in any of the courses during a standard four-year program even though some of the courses are only offered every second year.
- A six-year cycle of course offerings has been established and publicized. Certain courses are offered every year, others every second year, and still others every third year.
- A number of other upper new division courses have been created including a third year special topics course.
- The requirements for a mathematics major have been revised. We have added an English literacy requirement and a discrete mathematics requirement (among other changes).

Discussions are currently underway regarding our precalculus course, MATH 115. We are considering changing it from a three-credit course to a non-credit course.

Other news: We expect to move into a new building next spring; Jed Brown scored 31 on the last Putnam exam; we have established a mathematics prize; we now have an active Mathematics Society (under the BC Society Act).

- **UVIC** – David Leeming
The Department instituted a Math. Placement Test in Math 100 (Calculus I) in Sept. 2002. The purpose was to reduce failure rates in Math 100. To this end we had about 180 students write the test - 30 questions – 1 mark each with 15/30 being a pass. Covered basic algebra and trig. (no calculators).

We selected: 1. BC Sec. Grads with < B in Principles of. Math 12
2. Students from outside B.C. for whom we could not determine a grade in the Princ. Math 12 equivalent.

About 180 students

Results: 90% of BC Grads failed, 50% of others failed

Those students who remained performed significantly better – the drop in failure rate was from 27% to 14.5%. Since the cohort passing was larger, there was no drop in the Math 101 enrollment.

We repeated the process for the January 2003 intake into Math 100.

We will be using the Placement Test once again in September 2003.

John Phillips is stepping down after completing his three-year term as Chair of the Mathematics and Statistics Department. His successor has not yet been appointed.

- **VCC** – Costa Karavas
  VCC has experienced severe budgetary challenges in the 2002-2003 fiscal year. The Mathematics Department experienced a 7% reduction in instructor FTEs. Enrolment however is high with a strong demand for pre-calculus (12 sections) and Calculus12 (2 sections) courses.
  Costa Karavas continues as Department Head.

  New Initiatives
  - University transfer courses Calculus I (Math 1100) and Calculus II (Math 1200) have currently been developed and are in the process of being articulated for transfer credit with BC's universities and colleges.
  - The Calculus 12 (Math096/097) course offered at VCC has been provincially articulated and will be included on the online ABE Articulation grid.

  Faculty
  Jean Cockell is not teaching any classes in the Department and is now working as Acting Dean for the Institute of Indigenous Government.

- **Yukon College** – Tim Topper (received by e-mail)
  Offerings. One section each of:

  Math 100 Math 101 ~ Calculus I and II
  Math 130 ~ Finite Mathematics
  Math 105 ~ Introductory Statistics

  (Math 100 and Math 130 in the Fall; Math 101 and Math 105 in the Winter.)

  With regards to the effects of the changes in the High School curriculum I would observe that the students were particularly poorly prepared in trigonometry. Perversely the students in Math 130 seemed to be no better prepared in combinatorics and probability (which they should have seen more of).

  I would also note, though this may have been a local phenomenon, that the students were notably more dependent on their graphing calculators. A couple of examples: several did not know the quadratic formula (but did know how to "do it" on their calculators); few recognized the translation effects of adding a constant to a function or to the independent variable. We do not allow graphing calculators on the tests and exams in our calculus courses. I would be interested to know what others do.

On behalf of the entire committee, Susan Milner thanked Neil Coburn and his group for the wonderful lunches and food over the last two days.

4.2 List Updates: Telephone, Fax and E-mail

4.3 BCCUPM Web Site – Leo Neufeld

Susan Milner, on behalf of the entire committee, thanked Leo for keeping the BCCUPM website up-to-date.

Leo reminded the committee that there is a section on the website for advertising employment opportunities. Send Leo either the ad itself, or a link to the institution's website. Also, members of the committee were asked to check the Official Contacts List to ensure that the information for their institution is up-to-date.

5. NEW BUSINESS

5.1 How SFU's new graduation requirements may affect college students – Susan Oesterle

Susan Oesterle reported on an information session she had attended on Simon Fraser's new graduation requirements for undergraduates. Students will be required to have 6 credits in "quantitative" or "Q"-courses, three of which must be taken at SFU within the student's first 30 credit-hours at SFU. Before taking any of these Q-courses students must have one of the following: an A in PM11, 75% or higher in PM12, a C- or higher in one of SFU's Precalculus courses (100 or 110), or 75% or better on the SFU Math Placement Test. The concern for other institutions is that students who begin their post-secondary education outside SFU without one of the first three pre-requisites will have to take the Placement Test, even if they have completed Math courses equivalent to, or beyond these, at their transferring institution. At the time of the information session, no recognition was being given to previous articulation agreements for courses equivalent to SFU's Math 100 or 110, or for ABE courses equivalent to PM11 or PM12. This would seem to add an unnecessary hurdle to the transfer process.

Motion: moved by Neil Coburn and seconded by Rustum Choksi
that the chair of the BCCUPM write to Dennis Krebs, the chair of Simon Fraser's Undergraduate Curriculum Implementation Task Force, and to the Chair of SFU's Mathematics Department, expressing our concerns about the effects that the proposed changes will have on transfer.

Carried unanimously.

Richard DeMerchant requested that the letter also ask for clarification of the status of Applications of Math 12.

5.2 Transferability of ABE calculus courses – Wayne Matthews

There was nothing to add to the earlier ABE report.

5.3 Theme for our 82nd meeting

Suggestions for our next meeting included: discussion of the relationship between statistics and mathematics and the institutional problems that arise; discrete math; the use of computers in teaching math and stats; and on-line delivery of courses.

5.4 Online exam exchange

Given the amount of paper that is wasted each year by bringing multiple copies of our final exams to the BCCUPM meeting, options for using technology to exchange exams were considered. In the end it was decided that, for next year's meeting, representatives should bring one copy of each of the relevant exams, and a sign-up sheet for those interested in receiving a hard copy or email copy.

6. DATE AND LOCATION OF THE 82ND MEETING

The 82nd meeting of the BCCUPM will be held at UCFV (Abbotsford Campus). The tentative dates are June 3 – 5, 2004.

7. ADJOURNMENT OF THE FRIDAY SESSION

The Friday Session of the 81st meeting of the BCCUPM adjourned at 4:50 p.m.

Many thanks to Neil and the Selkirk College group for all their work in hosting us for this meeting.

List of Committee Members Present Plenary Session - Thursday, 2003-05-22; Mathematics Session -Thursday, 2003-05-22; Stats Sub-Committee Session- Thursday, 2003-05-22;Plenary Session - Friday, 2003-05-23

Name	Institution	THUR	MATH	STATS	FRI
Veda Abu-Bakare	BC Open University, Langara College	X		X	X
Jim Bailey	College of the Rockies (Vice Chair)	X	X		X
Ian Bailey	Malaspina University-College	X	X		X
Ross Bates	Selkirk College	X	X		X
Nicholas Buck	College of New Caledonia	X	X		X
Mohamed Chabi	Northern Lights College	X	X		X
Rustum Choksi	Simon Fraser University	X	X		X
Neil Coburn	Selkirk College	X	X		X
Barb Coombs	Selkirk College (Adult Basic Education)	X	X		X
Roger Coroas	Langara College	X	X		X
Natasha Davidson	Douglas College	X		X	X
Fae Debeck	University College of the Cariboo	X	X		X
Richard DeMerchant	Ministry of Education	X	X		X
Malgorzata Dubiel	Simon Fraser University	X	X		X
David Ellis	BC Association of Mathematics Teachers	X	X		X
David Feldman	Selkirk College	X		X	X
Frank Gruen	BC Institute of Technology	X		X	X
Fred Hughes	Camosun College	X	X		X
Mona Izumi	Northwest Community College	X	X		X
John Josafatow	Selkirk College	X	X		
Bruce Kadonoff	Coquitlam College	X	X		X
Costa Karavas	Vancouver Community College	X	X		X
Lee Keener	University of Northern BC	X	X		X
Rob Krausz	Selkirk College	X			
Colin Lawrence	BC Institute of Technology	X		X	X
Clint Lee	Okanagan University College	X	X		X
David Leeming	University of Victoria	X	X		X
Alex Liu	Kwantlen University College	X		X	X
Wayne Matthews	Camosun College	X	X		X
Melanie McDonald	Selkirk College	X	X		X
Susan Milner	University College of the Fraser Valley (Chair)	X	X		X
Leslie Molnar	College of the Rockies	X		X	X
Dave Murray	Okanagan University College	X	X		X
Wayne Nagata	University of British Columbia	X	X		X
Leo Neufeld	Camosun College (Retired)	X	X		X
Michael Nyenhuis	Kwantlen College	X	X		X
Susan Oesterle	Douglas College (Secretary / 81st Meeting)	X	X		X
Shane Rollans	University College of the Cariboo	X		X	X
Slava Simice	North Island College	X	X		X
Julie Tolmie	Simon Fraser University (Surrey)	X	X		X
Jim Totten	University College of the Cariboo	X	X		X
Ken Towson	Capilano College	X		X	X
Larry Weldon	Simon Fraser University	X		X	X

List of Participants (Meeting with Secondary School Teachers – Thursday, 2003-05-22)

Veda Abu-Bakare	BC Open University, Langara College
Jim Bailey	College of the Rockies(Vice Chair)
Ian Bailey	Malaspina University-College
Nicholas Buck	College of New Caledonia
Rustum Choksi	Simon Fraser University
Neil Coburn	Selkirk College
Barb Coombs	Selkirk College (Adult Basic Education)
Roger Coroas	Langara College
Natasha Davidson	Douglas College
Fae Debeck	University College of the Cariboo
Richard DeMerchant	Ministry of Education
Nicol DeVocht	Nakusp Secondary School
Malgorzata Dubiel	Simon Fraser University
David Ellis	BC Association of Mathematics Teachers
Frank Gruen	BC Institute of Technology
Fred Hughes	Camosun College
Mona Izumi	Northwest Community College
Bruce Kadonoff	Coquitlam College
Costa Karavas	Vancouver Community College
Lee Keener	University of Northern BC
Colin Lawrence	BC Institute of Technology
Clint Lee	Okanagan University College
David Leeming	University of Victoria
Alex Liu	Kwantlen University College
Wayne Matthews	Camosun College
Melanie McDonald	Selkirk College
Susan Milner	University College of the Fraser Valley (Chair)
Leslie Molnar	College of the Rockies
Dave Murray	Okanagan University College
Wayne Nagata	University of British Columbia
Leo Neufeld	Camosun College (Retired)
Michael Nyenhuis	Kwantlen College
Susan Oesterle	Douglas College (Secretary for the 81st Meeting)
Shane Rollans	University College of the Cariboo
Slava Simice	North Island College
Julie Tolmie	Simon Fraser University (Surrey)
Jim Totten	University College of the Cariboo
Ken Towson	Capilano College
Larry Weldon	Simon Fraser University

List of Participants (Professional Development Sessions – Saturday, 2003-05-24)

Veda Abu-Bakare	BC Open University, Langara College
Jim Bailey	College of the Rockies(Vice Chair)
Ian Bailey	Malaspina University-College
Ross Bates	Selkirk College
Nicholas Buck	College of New Caledonia
Neil Coburn	Selkirk College
Roger Coroas	Langara College
Natasha Davidson	Douglas College
Richard DeMerchant	Ministry of Education
David Feldman	Selkirk College
Frank Gruen	BC Institute of Technology
Fred Hughes	Camosun College
Mona Izumi	Northwest Community College
Colin Lawrence	BC Institute of Technology
Clint Lee	Okanagan University College
Alex Liu	Kwantlen University College
Wayne Matthews	Camosun College
Melanie McDonald	Selkirk College
Susan Milner	University College of the Fraser Valley (Chair)
Leslie Molnar	College of the Rockies
Dave Murray	Okanagan University College
Leo Neufeld	Camosun College (Retired)
Michael Nyenhuis	Kwantlen College
Susan Oesterle	Douglas College (Secretary for the 81st Meeting)
Slava Simice	North Island College
Julie Tolmie	Simon Fraser University (Surrey)
Jim Totten	University College of the Cariboo
Ken Towson	Capilano College
Larry Weldon	Simon Fraser University

BC Colleges High School Mathematics Contest Report –

On May 3, 2002 the final round of the BC Colleges High School Mathematics Contest was written at 7 provincial colleges and university colleges. 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 college with several activities involved.

This year the participating colleges and university colleges were:

Camosun College (Cam)
Capilano College (Cap)
College of New Caledonia (CNC)
Malaspina University College (MUC)
North Island College (NIC)
Okanagan University College (OUC)
Selkirk College (Sel)
University College of the Cariboo (UCC)
University College of the Fraser Valley (UCFV)

The table below gives a summary of the number of students and the top scores in the final round at each institution.

Institution	Preliminary Round		Final Round		Top Three Scores	
	Juniors	Seniors	Juniors	Seniors	Junior	Senior
Cam	140	60	24	9	86,72,64	57,46,45
Cap			27	18	86,82,79	78,76.5,71
CNC	91	363	30	10	90,58,53	60,48,40
MUC	402	243	26	30	87,79,67	82,75,65
NIC	350		6	28	91,50,50	41,34,33
OUC	800	340	46	37	71,62,61	64,61,56
Sel	40		6	6	47,43	54,52
UCC	289	205	29	31	74,69,56	76,48,44
UCFV	200	40	31	22	92,88,75	82,64,57

The numbers above for the preliminary round are at best approximate, as we seem not to have a reliable method for gathering this information. Nonetheless, it appears that approximately 3600 students participated in the preliminary round and 420 in the final round.

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 test is administered in the morning, with some type of activity provided for the sponsoring teachers, and, after the test is completed, lunch is provided for all participants. After lunch the activities vary. Some institutions have talks for the students, others combine talks with other activities, such as a math relay, while others have more strenuous activities, such as basketball math. During the time that the afternoon activities take place, the tests are marked, and later in the afternoon prizes are awarded. The prizes vary among institutions. Some institutions give book prizes to all or selected participants; some give cash prizes and/or scholarships to winners; many give T-shirts to all participants.

Thanks should go to those who have been involved in organizing their own college faculty to get on board, and have also been actively enlisting the local teachers to encourage involvement of their high schools. First there are the primary contacts at each of the Colleges: Wayne Matthews at Camosun College; Lily Yen at Capilano College; Judy Malcolm at College of New Caledonia; Patrick Ng at Malaspina University College; Clint Lee at Okanagan University College; Susan Milner at University College of the Fraser Valley; and John Siggers at The University College of the Cariboo. Although these are the primary contacts at each institution, it goes without saying that they did NOT do all the work required to make this contest a success. Indeed, they have indicated that their entire departments were involved with hosting the contest, and to be sure to

thank all of them. Special thanks should go to John Grant-McLoughlin of University of New Brunswick, who, as a professor in Mathematics Education, continues his involvement with our contest even though he is on the other side of the country and brings the rest of us back to reality regarding what we can reasonably expect high school students to be able to handle.

Furthermore, the problem posers who either submitted problems or came together at Douglas College in New Westminster last May to put together the initial draft of all four contest papers are: Wayne Matthews (Cam), Jim Bailey (COTR), Nicholas Buck (CNC), Clint Lee and David Murray (OUC), David Feldman (Sel), Susan Milner (UCFV), Alan Cooper (Langara), Lily Yen (Cap), Dan Henschell and Aubie Anisef (Douglas) and John Siggers and Jim Totten (UCC).

In addition, those who proof-read the contest papers and offered solutions for the questions are: Clint Lee (OUC), John Siggers (UCC), John Grant McLoughlin (UNB), Dave Murray (OUC), Susan Milner (UCFV), Nicholas Buck (CNC), and Jim Totten (UCC). The complete solutions were prepared and typeset by Clint Lee, with additional solutions and corrections supplied by John Siggers and Jim Totten. Last, but not least, Clint Lee took on the task of typesetting all four contest papers and coordinating feedback coming from several proof-readers, sometimes all suggesting conflicting ways to improve questions.

Apologies to anyone whose name may have been inadvertently left out.

For those planning for next year the proposed dates for the 2004 contest are:

Preliminary Round:	Wednesday March 10, 2004
Final Round:	Friday May 7, 2004

Respectfully submitted to the BCCUPM on May 22, 2003 by

Clint Lee