Minutes from Statistics Sub-Committee Meeting
at 97th BCCUPMS Meeting
May 15, 2019

Venue: College of the Rockies, S105
Time: 9:20 am to 12:00 pm (with 10-minute refreshment break)

Present: Iqtider Ali Shak (Yorkville University), Mahshid Atapour (Capilano University), Jeannie Cameron (NIC), Bruce Dunham (Chair, UBC-V), Dan Henschell (Douglas College), Claude Hurtubise (Okanagan College), Andrea Hyde (COTR), Simin Jolfaee (BCIT), Susan Kinniburgh (Camosun College), Michael Lo (Secretary, Langara College), Iain Pardoe (TRU-OL), and Shane Rollins (TRU).
Apologies for absence: Harsha Perera

1. **Approval of agenda**
   The approval of agenda was moved by Shane Rollins and seconded by Mahshid Atapour.

2. **Approval of minutes from Statistics subcommittee meeting from 96th meeting**
   The approval of minutes was moved by Susan Kinniburgh and seconded by Dan Henschell.

3. **Matters arising from the minutes**
   - The BC-wide Minitab licensing was brought up for further discussion. If the approximately $4,000 cost is split among different institutions, there are problems both in terms of administration and fairness. The Chair had attempted to find clarification from BCNet regarding how the licensing arrangement would work, without total success. The Chair voiced an opinion that statistical education is moving away from commercial software and towards open source cloud-based resources, which have some obvious advantages over Minitab.
   - Following previous discussions on the proposal for the content of a generic introductory course put forward by Julie Peschke (Athabasca), clarification was sought regarding the importance of the P-value in hypothesis testing. There was general agreement that at least some discussion of P-values was essential in an introductory course. Julie had also posed the question as to whether anyone knew of any open source textbook that presented hypothesis testing using only the critical value approach. No-one present was aware of such a resource.

4. **Institutional Reports**

British Columbia Institute of Technology
The Department of Mathematics at BCIT teaches about 25 statistics courses, most of which are introductory statistics. The computing program recently added introductory statistics to their required courses, and our department has been developing and teaching introductory statistics courses with a computing/IT flavor for such students. The part-time studies statistics courses (MATH 1060 and 3060), taught in the Applied Data Analytics Certificate program, are quite popular. There has been much growth in part-time studies courses since launching, partly driven by international students. The department uses mostly R, and occasionally Excel or Minitab.

Camosun College
There are no curriculum changes to Camosun's university transferrable courses. Some enrolment changes to note: an additional section of STAT 219 (Probability and Statistics 2) was offered but it was not sustainable and the course will revert to back one section per year; additional sections of

STAT 254 (for engineering) will be offered next year. Summer offerings have been particularly popular. The department continues to use OpenIntro in STAT 116, MyOpenMath and WeBWorK for online homework, and labs using Excel with MegaStat and R.

College of the Rockies

The college has offered around six sections of STAT 106 (Intro stats for business) and one per year of STAT 206 (calculus based).

There have been ongoing efforts to make changes to the stat labs. Excel is used now which works well for our business students who make up a significant portion of the enrollment. Biology requires R and collaboration is ongoing to develop labs in R so that those students can use the STAT 106 course for transfer to their program.

Lyryx has been adopted for homework and the associated OpenStax Business Statistics text book. Students seem to like, but not love, the system and the text.

Langara College

The year has seen one retirement and one resignation, three new hires and a couple of emergency hires.

The new program Post-Degree Diploma in Data Analytics was launched in January 2019. There are two intakes a year (January and September). It has a cap of 30 students and is running in cohorts. A co-op option is in the works. Students are predominantly international students.

A new program (Post-Degree Certificate in Data Analytics) is in the works. It is funded by the Ministry of Advance Education, Skills and Training and for exclusively domestic students.

There are six new courses in the Data Analytics program and one new introductory statistics for the Kinesiology major.

Currently, StatGraphics is adopted, which students can download on a PC. SAS (Enterprise Guide, SAS Studio and version 9.4) and R (only R-Studio, under the Anaconda package, which includes Python) are installed successfully on the network. There are plans to use R in some of the introductory statistics courses.

North Island College

North Island College has one statistics course: MAT 115 Introduction to Statistics. MAT 115 is an algebra-based course which serves life science, business, and criminology students with a minimum Foundations of Math 11 prerequisite. There are approximately four sections per year of MAT 115 with three at the Courtenay campus and one ITV (interactive TV) section between the Campbell River and Port Alberni campuses as well as a distance option offered in the Fall and Winter terms. An increase in international students continues to support an additional section at the Courtenay campus in Summer 2019. Students use free online statistics software applets to perform statistical analysis. There is no lab attached to the course. The textbook will change to the OpenIntro Stats in Fall 2019.

As of Fall 2019, MAT 115 becomes STA 115.

Simon Fraser University

There have been a number of changes over the past few years as the department tries to move towards data science and an increased focus on computation. Efforts are being made to grow our minor and major enrolments. Also, an undergraduate interdisciplinary major program in Data Science was introduced. It is a joint Statistics/Actuarial Science, Math, Comp Sci, and Business program and replaces the previous Management and Systems Science.

There are a couple of new lower division items since last year. Reproduced below are summaries of the major and minor statistics requirements at the lower division level and descriptions of the

contrast between the major and minor programs.
Current lower division major requirements: 2 CPSC; Calc 1, 2, 3; Linear Algebra; STAT 180 (1 credit); STAT 240, 260, 261, 270, 285.
1) STAT 180 is "Career Development Seminar for Statistics and Actuarial Science".
2) STAT 240 is "Introduction to Data Science".
3) STAT 260/261 is "Introduction to R"
3) STAT 270/285 traditional Math Stat introductory courses; no significant recent changes.
Current lower division minor requirements: Calc 1, one of Calc 2 or Linear Algebra; one of STAT 201, 203, 205 (all non-calc), 270 (calc), or Business Statistics (BUEC 232), STAT 260/261
Upper division: creation of courses with multiple entry routes (these courses are shared between minor and major students)
1) Statistical Learning and Prediction (STAT 452), Time Series (STAT 485), Discrete Data (STAT 475), Applied Multivariate Analysis (STAT 445). All are cross-listed with 6XX graduate courses for students in outside disciplines.
2) All have prerequisite structures which permit students to by-pass theory and use noncalculus based courses (one of STAT 201/203/205/BUEC 232 plus one of STAT 302/305/BUEC 333– none of these courses count toward the major program requirements).
Enrollments: The department has decided to try to grow enrollments by adding sections of heavily subscribed courses. Therefore, extra sections for STAT 100, 302, and 305 have been offered.

Thompson Rivers University
The proposed Masters of Science in Data Science has gone through DQAB and is awaiting final approval. Three statisticians have been added to the department over the past three years: Dr. Xiaoping Shi, Dr. Mateen Shaikh, and Dr. Jabed Tomal, the latter two specifically to support the Data Science degree.
No new STAT courses have been added. Work is in progress converting the Mathematical Sciences degree to a Data Science degree in conjunction with the Computing Science Department.
The numbers in all statistics courses remain stable, including the section for Tourism students which has still not seen a decrease despite being replaced in their program a couple of years ago. Tourism has not revisited that decision even though their students seem to gravitate towards our offering rather than that of Geography. Hopes remain the decision will be reversed.

University of British Columbia, Vancouver
Demand for courses and programs in statistics continues to increase at UBC. Over 500 undergraduate students are taking a specialisation involving statistics, with around a further sixty enrolled on the minor. In addition, close to 100 students have applied this year to major in statistics as "late entrants", hoping to enter the major at second year level or higher.
The department offered a new data science course at first year level, DSCI 100: Introduction to Data Science. The course has a pre-requisite of any Mathematics 12 course. Featured topics include data wrangling, visualisation, classification methods, clustering, and regression. There is no credit exclusion with existing STAT courses. The course attracted around sixty students in its trial run. The plan is to expand the course in response to an increase in demand for data science skills across the university.
The Flexible Learning project, funded by UBC's Teaching and Learning Enhancement fund and the SSC, has continued developing and testing resources for introductory courses. All resources created are open-source and freely available via a new website, StatSpace. Educators are welcome to explore and register for StatSpace at statspace.elearning.ubc.ca.

Two new faculty members are to join the department this year. Benjamin Bloem-Reddy will join as an assistant professor having previously been at Oxford. Keegan Korthauer will also arrive in a joint position with BC Children's Hospital Research Institute, having most recently worked at Harvard. Two long-standing members of the department, Rollin Brant and John Petkau, are retiring. Further details on any of the above can be obtained by either visiting www.stat.ubc.ca or contacting Prof. Bruce Dunham at b.dunham@stat.ubc.ca.

Vancouver Community College

The Mathematics Department in the School of Arts and Sciences offers multiple sections of Introduction to Statistics (MATH 1111) within the academic year.
A new statistics (calculus-based) course, MATH 2700 - Probability and Statistics for Science and Engineering, has been introduced which will complement the Associate of Science degree (in progress). This course will also be open for transfer credit to UT students. The new course has been developed and currently been revised to include Calculus II as a prerequisite rather than a co-requisite.
Enrolment in the Statistics course (MATH 1111) experiences high enrolment as it serves as a core course for many Health Science programs and especially for the BSN (Bachelor of Nursing).
The course is also offered in an online format using MOODLE/MyMathLab pairing as of 2018.
Software: MS Excel is the software currently used for MATH 1111.

5. **Statistics 12**

The new Statistics 12 high school course will roll out in the province in the next academic year. The Chair has run various workshops for teachers, such as a one-day workshop in Burnaby in February. Further professional development opportunities for teachers are planned, including a session at the BCAMT annual conference October.
The new course is different from most traditional introductory courses (including, for example, AP Statistics) in that there is an emphasis on statistical thinking, including the evaluation and conducting of research studies, simulation-based inference, and the communication of statistical ideas.
Members of the subcommittee were encouraged to reach out to their local high schools to offer support to any teachers who may be planning on teaching the new course.

6. **Use of online, open access resources**

Following previous discussions of open access resources, there was a brief review of free online materials for teaching statistics that those present were aware of. Notable mentions went to resources located at merlot.org, the online homework system WeBWorK, and UBC's new platform StatSpace. The Chair encouraged those in attendance to register for StatSpace and promote it to their colleagues.
Other freely available resources had been mentioned during institutional reports, including OpenIntro Statistics (which has an editable LaTeX version available), Lyryx (and the associated OpenStax statistics text book), MyOpenMath, and R (including R Studio).

7. **International Statistical Literacy Project Poster Competition**

Interest in the previous ISLP competition from within the province had been minimal, even though a new category had been created to encompass undergraduate student entries. The competition runs every two years, and submissions for the next competition will begin in January 2021. All are encouraged to keep the poster competition in mind, particularly for courses involving student projects.

8. **Election of Secretary**
   Andrea Hyde nominated Michael Lo as the secretary of the subcommittee, seconded by Shane Rollins. Michael accepted the nomination and will be the statistics subcommittee secretary for one term of two years by acclamation.

9. **Any other business**
   An unusual situation has arisen at Camosun where The Department of Economics has recently renamed to become The Department of Economics, Statistics, and UT Business. This is odd, since the institution also has a Mathematics and Statistics Department. Moreover, from what can be gleaned from their website, no faculty in The Department of Economics, Statistics, and UT Business has any formal qualification in statistics. While the move is somewhat flattering, the subcommittee did express severe reservations about departments without appropriate faculty incorporating "statistics" into their name. The lack of consultation at Camosun over the name change casts some doubt over the inner workings of the institution and raises questions concerning academic credibility.

10. **Motion to Adjourn**
    Dan Henschell moved to adjourn, seconded by Iqtinder Ali Shak.