Math Department Frequently Asked Questions

My student loves math! What can they do outside of their regular math class?

Burnaby Central Secondary has some clubs that are great for students who love math! We have Math Club (which participates in mathematics competitions), Board Game Club, and Chess Club.

Burnaby Central offers elective courses students can take as soon as they have completed Math 10. These include Computer Science 11, AP Computer Science, Statistics 12, and AP Statistics. Additionally, History of Mathematics 11 and Geometry 12 are new courses which will be offered in alternating years.

After they have completed Pre-calculus 12 students may also take Calculus 12, followed by AP Calculus 12 AB if they wish.

Burnaby Central runs several math contests throughout the year. These include the COMC, CIMC/CSMC, Pascal/Cayley/Fermat, Fryer/Galois/Hypatia, and Gauss.

Are there any resources for my student who would like more math practice?

Please see the math department website for resources. (Games, helpful sites, extra practice, enrichment, and more!)

https://burnabycentralsmathematicsdepartment.wordpress.com/

My student is in grade 9 or 10 and isn't sure what math course they should select next year. How do they choose?

Please see the course descriptions and brochure for details about available courses and the possible mathematics pathways. Your student is strongly encouraged to discuss their decision with their current math teacher. Your student's counsellor can also be helpful in making a decision that fits with their goals.

What math textbooks do you use at Burnaby Central?

Not all teachers use a textbook in their classes. The textbooks that are used can be found below:

Mathematics 8 – "Math Links 8"

Mathematics 9 – "Math Makes Sense 9"

Foundations & Precalculus Math 10 – "Pearson: Foundations & Precalculus 10"

Foundations of Math 11 – "Nelson: Foundations of Mathematics 11"

Pre-Calculus Math 11 – "McGraw-Hill Ryerson: Precalculus 11"

Foundations of Math 12 – "Nelson: Foundations of Mathematics 12"

Pre-Calculus Math 12 – "McGraw-Hill Ryerson: Precalculus 12"

Calculus 12 & AP Calculus AB – "Stewart: Calculus, Early Transcendentals" – 5th Edition and/or 7th Edition

Statistics 12 & AP Statistics – "Starnes: The Practice of Statistics" – 5th Edition

What enrichment opportunities are available for grade 8 or 9 math students?

Mathematics 8 and 9 teachers are focused on creating enrichment opportunities for learners within their mathematics 8 and 9 classes. We do not have a designated math 8 or 9 enriched course.

Does my student need to take a math contest to get into Math 10 Enriched?

Yes, students applying for Math 10 Enriched will need to sign up for and take the Pascal Math Contest in February.

What else does my student need to do to get into Math 10 Enriched?

Recommendation from your student's current mathematics teacher will be considered. They often take into consideration the following criteria when recommending students for an Enriched class:

- Student interest in mathematics
- Participation in their math class
- Attendance
- Takes risks
- Problem solving
- Challenges themselves
- Self-starters
- Student's mark in their current course

Please note that enriched classes are not guaranteed to run. This is dependent on several factors, including student interest, timetable availability, and if student cohorts are once again necessary.

What is the difference between Calculus 12 and AP Calculus AB?

AP Calculus AB is an extension of Calculus 12. In other words, we cover additional topics that are not included in the Calculus 12 course. Calculus 12 serves as an introduction to Calculus, preparing students who will need to take Calculus in post-secondary.

At the end of AP Calculus AB (in May), students have an opportunity to write an exam that can grant them credit for a first year post-secondary Calculus course. At Burnaby Central, students take AP Calculus AB over <u>two semesters.</u> This means that students must enroll in <u>both Calculus 12 and AP Calculus AB</u>. (They will take Calculus 12 in the first semester and AP Calculus AB in the second semester).

What is Statistics about?

Statistics is the study of data. More specifically, it can be divided into two main parts: *Descriptive Statistics* and *Inferential Statistics*.

Descriptive Statistics, as the name implies, allows us to describe data, whereas Inferential Statistics allows us to draw conclusions from data and helps us make sound decisions.

Why Statistics?

Though it is placed into the Mathematics department, Statistics is applicable, or even crucial, to a plethora of disciplines. For example, an environmental scientist may perform a hypothesis test to see whether an ecological intervention is having the desired effect of relieving climate-driven stress, while a political scientist may use a confidence interval to estimate the effects of a public policy.

With so much data and information in our world, the study of Statistics allows us to avoid common pitfalls such as biased samples, overgeneralizations, and incorrect applications of causality.

Finally, statistics is also a key component of the emerging fields of Data Mining, Big Data, and Machine Learning, which seek to extract, interpret, analyze, and utilize larger and more complex data sets.

What are somethings that the Statistics (Stats) courses would cover?

The first part of a Stats course will be descriptive. For example, students will learn to differentiate between *qualitative* (e.g. favourite colour or ice cream) and *quantitative* (e.g. height or how much someone like statistics on a Likert scale) statistics. Also, student will learn to summarize data, using *mean*, *standard deviation*, and other descriptors.

The second part will be inferential. Students will learn to find the *expected value* of an event (e.g. likelihood of good weather tomorrow) and to produce and interpret *confidence intervals* (e.g. the results of a poll for an election). Students will also learn about *hypothesis testing* (e.g. is this a fair coin/die?)

What is the difference between AP Statistics and Statistics 12?

While Statistics 12 is an accredited course in the BC curriculum, AP Statistics is a college-level high school statistics course. The key difference is the opportunity to write the AP Statistics Exam, which can grant credits for a first-year post-secondary Statistics course.

Some of the topics vary between the two courses. Statistics 12 places a greater emphasis on the historical perspective of statistics and the communication of statistics to a general audience, whereas AP Statistics is a more rigorous interpretation of the topics described above.

What language do we learn in the Computer Science courses?

The computer science courses are taught in Java. Java is a modern browser-based language. The structure and skills learned in this course are easily transferred to other languages (for example, C++ and Python)

Do students need their own computer for the Computer Science courses?

No! Students are provided a desktop computer to use during class time. However, many students bring their own laptop to work in the same environment at school and at home.

Tell me more about AP Computer Science.

AP Computer Science is a first-year post-secondary level programming course. Further courses teach advanced structures and concepts, such as file and database management.

Once the course is completed, students have the option to write an AP Exam (in May). If they score a 4 or a 5 on the AP Exam, students may be eligible for first year University course credit. (NOTE: the rules for each university vary).