Mathematics – Improving Performance of Grades 11 & 12 Students
Presented by Dr. Jude Kong, York University
SummerUp 2022
Course Description

Course Name: Mathematics – Improving Performance of Grades 11 & 12 Students
Who Should Apply: You are a Black youth, Ontario resident, and you are willing to spend part of your summer working to improve your mathematics performance. As well, you fit into one of the following three categories:

- You will be enrolled in Grade 11 in September 2022.
- You will be enrolled in Grade 12 in September 2022.
- You will be enrolled in post-secondary studies in September 2022.

Visit the SummerUp Website: https://llileaders.com/summerup/

What
This math course is designed for Black youth who have a *continuous improvement* mindset or wish to acquire this mindset. These are students who understand the importance of mathematics to their academic, career, and professional success, and who are determined to do whatever they can to ensure a smooth transition from:
-Grade 10 to Grade 11,
-Grade 11 to Grade 12, and from
-Grade 12 to university or college.
These students are already achieving good grades in mathematics but know they must continue to think and practice mathematics to stay sharp and improve. Also, these are students who know they have missed important math concepts during the past year and need to 'catch u and be ready at the starting line this September.

This SummerUp math course will use a 'community-oriented approach' for teaching mathematics. The aim is to inspire Grades 11 and 12 students to think about mathematics in the right way, to help them hang on to their math skills during the summer break, address mathematics anxiety, and fill any gaps in mathematics knowledge. The progression into the next level of mathematics that these students are challenged to make, requires they continue to hone their mathematics skills and prevent the erosion of such skills during the summer break.

Here's what we mean by a 'community-oriented approach'.
-Students will work in groups so that they support each other as they share and learn together. This is a learning environment where it is OK to say: '*I don't understand.*'
- Instructors, all from the Department of Mathematics, York University, will constitute a 'community of instructional support'. They are all committed to helping students improve their mathematics skills.
-There will be two 'engagement support' staff who will provide students with encouragement and supportive advice outside of scheduled classes.
-There will be a set of optional in-person meetings (e.g., lunch meetings), for students who are able to attend, where students may casually meet each other and reinforce the spirit of 'community'.

What's special is that students join a community comprising other Black youth, and they work collaboratively in encouraging and supporting each other towards a deeper understanding of major mathematical concepts. Together, they develop the mindset that they can improve math performance, and together they achieve.

Why this Matters

The two academic years spanning 2020-22 were severely disrupted by COVID-19. Add to this the well-studied effect of the 'summer slide' which sees many students regress in their academic performance during the summer months. Combined, these two perils can impair the academic readiness of Grade 12 students entering university and college programs. As well, they jeopardize the prospects for high achievement by Grade 10 and Grade 11 transitioning to the next grade level. Clearly, good mathematics grades are required for admission into many post-secondary programs, and for high achievement. How often we have heard students in first-year university preach "I wish I had worked harder at my high school math".

This SummerUp mathematics course is premised on improving the performance of students entering Grades 11 and 12 math courses in September 2022, and for students transitioning from Grade 12 into post-secondary studies in the fall. Students should take this course because it offers opportunities to:

- improve mathematics performance (e.g., algebra and calculus review) at a crucial point in their academic and career pathway,
- enhance prospects for admission into STEM-based post-secondary studies,
- increase confidence in the level of mathematics preparation for post-secondary studies,
- facilitate the joy of mathematics when concepts are clarified and teaching/learning methodology is 'community oriented', and
- discover how the mathematics learned in elementary, junior, and high school can be applied, and built upon, to solve real-life problems.

Here are the opinions of three students who took this course in summer 2021:

Student #1*: "I learned a lot of new skills in math and that working with a group of people that are not afraid to communicate makes the process a lot more fun. And I am now much more confident in my math skills and I am not afraid to ask questions anymore."*

Student #2: *"It was a great way to become comfortable with difficult concepts and learn together with other students who have similar experiences of feeling left behind in a traditional classroom especially considering the friendly and positive atmosphere that our instructors created."*

Student #3: *It was a lot of fun and much different than working in a school setting but in a good way. Everyone communicated clearly, was friendly, and was fun and easy to work with. I learned a lot of new math skills and made new friends that I still communicate with."*

Admissions Information

Who: You are a Black student, Ontario resident, and you want to spend this summer improving your mathematics skills in readiness for the next academic year which begins September 2022. You fit into one of the following three categories:

- You will be enrolled in Grade 11 in September 2022.
- You will be enrolled in Grade 12 in September 2022.
- You will be enrolled in post-secondary studies in September 2022.

You have a suitable computer and reliable access to the Internet (a mobile device is not suitable for this course). You are willing to commit to attending all scheduled online learning sessions (see dates and times below).

Admissions Process: All eligible applicants will be considered for admission. Refer to application deadlines at https://llileaders.com/summerup/ An orientation session will be provided.

Start/Stop Dates: SummerUp will offer *Mathematics – Improving Performance of Grades 11 & 12 Students* in hybrid mode over a span of five weeks starting on Tuesday, July 12, and ending on Thursday, August 11. Online classes will be two hours in duration and span from 10.30 a.m. to 12.30 p.m.

Meeting Pattern: On designated Tuesdays, Wednesdays, and Thursdays, this course will meet online between 10.30 a.m. and 12.30 p.m. Two optional in-person events are scheduled, and other casual meetings will be added if students agree. Applicants must commit to attending the following online classes:
Week 1: Tuesday, July 12; Wednesday, July 13; Thursday, July 14 (10.30 a.m. to 12.30 p.m.)
Week 2: Tuesday, July 19; Wednesday, July 20, Thursday, July 21 (10.30 a.m. to 12.30 p.m.)
Week 3: Tuesday, July 26; Wednesday, July 27; Thursday, July 28 (10.30 a.m. to 12.30 p.m.)
Week 4: Tuesday, August 2; Wednesday, August 3; Thursday, August 4 (10.30 a.m. to 12.30 p.m.)
Week 5: Tuesday, August 9; Wednesday, August 10; Thursday, August 11 (10.30 a.m. to 12.30 p.m.)

In-person Meetings:
Tuesday, July 12: In-person luncheon meeting at York University for those who can attend.
Thursday, August 11: In-person wrap-up luncheon meeting at York University for students and parents who can attend.
Optional Activities: Subject to student agreement, small group community-style lunch meetings may to be scheduled.

Mode: Online. Most classes are online. In-person sessions are optional.

Dress: Inasmuch as this course includes an in-person component and given that appropriate dress is a part of the learning experience, a dress code will apply. Students attending the in-person luncheon meetings on July 12 and August 11, will be provided a special T-shirt which must be worn.

Required Tool
To do well in this mathematics course, students must have a suitable computer and reliable Internet access. A mobile device is not suitable. Students who do not have the required device equipment should request a loan of this equipment from their high school.

Faculty
Course Leader: Dr. Jude Kong

Dr. Jude Kong is an Assistant Professor in the Mathematics & Statistics Department at York University. He is the founding Director of the Africa-Canada Artificial Intelligence and Data Innovation Consortium, a member of the Canadian Black Scientist Network, a member of the Scientific Advisory Committee of the Mathematics for Public Health Network, a member of the National COVID-19 Modelling Rapid Response Task Force and a member of the Canadian Centre for Disease Modelling. He obtained his Ph.D. in Mathematics from the University of Alberta, and his MSc. in Mathematical Modelling from the University of Hamburg-Germany and University of L'Aquila-Italy. His B.Sc. in Mathematics and Computer Science was acquired at the University of Buea-Cameroon and his Bachelor of Education (B.Ed) degree in Mathematics was earned at the University of Yaounde-Cameroon. In 2015, Dr. Kong was awarded the University of Alberta's teaching award. Dr. Kong is an expert in mathematical/statistical modelling, artificial intelligence, data science, infectious disease modelling, and population dynamics. His principal research objective is to use mathematical/statistical modelling to study the impact of environmental stressors on species distribution and the dynamics of infectious diseases.

Yohana Solomon
Yohana Solomon is a Ph.D. candidate in the Department of Mathematics and Statistics at York University. Her research focuses on algebraic combinatorics, which is an interplay between algebra and combinatorics. For over ten years, she has taught mathematics to students of all ages and levels. She has also organized several workshops and panels that highlight and celebrate the achievements of a diverse group of mathematicians. She is active in promoting an inclusive mathematics community.

Sheriff Shuaib (M)

In 2014, Sherif Shuaib completed his B.Tech in Mathematics/Computer Science from the Federal University of Technology Minna, Nigeria. He subsequently received his MSc. in Applied Mathematics from the Prince of Songkla University, Thailand, in 2020. He has also worked as an

editor at the Publication Unit, Prince of Songkla University, Pattani Campus, Thailand. His research interest lies in Mathematical Modeling, Epidemiology, and Ecology. He is currently a PhD student at York University working on the impact of environmental stressors on species distribution and abundance. He also assists with mentoring Black mathematics students at York University.

Dr. Jummy David

Dr. Jummy David is currently a Postdoctoral Fellow at the Department of Mathematics and Statistics, and Fields-CQAM Laboratory of Mathematics for Public Health (MfPH/LIAM) at York University in Toronto, Canada. She obtained both MSc. in Mathematics and Ph.D. in Interdisciplinary Studies from the University of British Columbia in Canada and major in Applied Mathematics. Her research interests in applied mathematics mainly lie in mathematical biology, mathematical epidemiology, population dynamics, numerical analysis and simulations, data analysis and model calibration. Dr. David is currently leading the MfPH Next Generation involving early career mathematical modellers and upcoming research scientists across several Universities in Canada. As an infection prevention and control expert, Dr. David is great at optimizing policy design to achieve targets for disease elimination as a public health concern using different mathematical modelling approaches, several optimization tools for model calibration with sound programming skills (Python, Matlab, R, and SQL) and hands-on Machine learning tools (Pandas, Scikit-Learn, Keras, PyTorch, TensorFlow), while using different visualization techniques (Excel, ggplot2 libraries, Matplotlib, plotly and seaborn).

Dr. Wisdom Avusuglo

Dr. Wisdom Stallone Avusuglo is an International Development Research Centre-sponsored postdoctoral fellow. He is an executive member of the Africa Canada Artificial Intelligence and Data Innovation Consortium, York University. He obtained his Ph.D. in Statistics, University of Western Ontario, Canada, Master's in Applied Modelling and Quantitative Methods, Trent University, Canada, and Bachelor of Arts in Economics and Mathematics, University of Ghana, Ghana. His research interest spans Applied Probability and Statistics; Financial Risk Management; Infectious Disease Modelling; Applied Dynamic Optimization to Economic Epidemiology. In his downtime, Wisdom reads and spends time with family and friends.

Student Engagement Team:
Yvonne Reid

Yvonne Reid has a passion is to use her knowledge, voice, and advocacy skills to affect change in her community. Last summer 2021, Yvonne brought her passion to support Black students who enrolled in the SummerUp mathematics course. She returns this year to support, encourage and engage students who will enroll in SummerUp 2022's mathematics course. Yvonne is a Child and Youth Counsellor with the Toronto Catholic District School Board (TCDSB). She is also a life coach and a speech coach. For the past three years, Yvonne has served as a speech coach for students enrolled in the Leadership by Design program.

Student Engagement Team:
Sade Rose

Sade Rose is a pure-mathematics graduate of York University (BSc Mathematics) with a zeal for unlocking the potential of other youths – helping them to be the best they can be. Her passion for helping students led her to become a Peer-Assisted Study Sessions (PASS) leader at York University where she assisted first-year calculus students with understanding concepts they found challenging. Sade enjoyed this experience and went on to become a high school mathematics teacher at an independent school – an experience that she finds rewarding and fulfilling.
Sade will be part of the community support team for the SummerUp mathematics course. As well, she can provide tutoring support outside regularly scheduled classes.

Special Note:
SummerUp is a program designed to serve and support the personal and professional aspirations of Ontario's Black youth. The program is developed and presented by the **Lifelong Leadership Institute** (LLI), and it is primarily funded by the Ontario Ministry of Education. The quality of the SummerUp experience is assured by the contributions of a diverse group of individuals, educators, institutions, and corporations – all of which are committed to championing the well-being, development and advancement of Black youth.
The Lifelong Leadership Institute also offers the **Leadership by Design** program which provides extensive leadership-development opportunities to Black youth.

The **SummerUp** 2022 program is primarily funded by the Ontario Ministry of Education.