

FINANCIAL MARKETS SIMULATION CENTRES

PROGRAM CODE: AEAM02

Additional Mathematics Part 2 (second year topics)

Highlights

- In living life, the secret of the How's is actually in the Why's!
- History is actually an important subject. Knowing history well tells us why we are here today. Knowing history really well can sometimes even tell us where we are heading into the future!
- This program covers topics which are generally covered in a typical second year of Additional Mathematics (in Singapore, that would be the equivalent of Secondary 4 Additional Mathematics)
- Where possible, we will question the Why's as a first step to building the requisite foundation in each topic.
- Where possible, we will break down the concepts into bite-sized pieces that can be “chewed upon” and “chewed upon” until it becomes ready to be applied.
- The concepts and experiential knowledge gained earlier is then applied to arriving at step-by-step logical solutions optimally.
- When one understands the concepts and experiential knowledge fully, one then “owns” the knowledge, and never has to return it ever. This also builds confidence in explorers, and in turn encourages them to be “thinkers” and not just “doers”

Alpha Guide-in-Chief
Dr. Jeffrey C. K. Lim, Ph.D., C.Sci., C.Math., FIMA, FRM, PRM, B.Fel.

Program Duration
Weekly, 2 Hours, 1 Academic Year

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Seminar Background

"Not everyone can be a mathematician, but a mathematician can come from anywhere!"

Dr. Jeffrey C. K. Lim

"The Study of Probability Theory stems from man's inability and yet the need to comprehend the science of exactness."

Dr. Jeffrey C. K. Lim

Jeff will guide explorers in mathematics in discovering the Why's in mathematical development, formulae, theorems etc. and in turn ensure that the explorers "own" the full experiential knowledge and understand how to approach problems with clarity and arrive at logical step-by-step well thought-out solutions. Until one has gone through such a journey, one can never really say they "own" the true experiential knowledge. Only when one has acquired and "owns" such an experience, then can one rightfully "retain it" (after-all it's yours forever), and even has the opportunity to pass on such an acquisition to future generations.

Jeff believes in "doing what is right, rather than what is acceptable!", and has been practicing this guiding belief for decades in his professional life and even from his younger days. Hence, the learning journey with the Alpha Guide will not focus only on studying and examination preparation. It will start from the very roots of reason (where possible), building an unshakable foundation prior to moving on to applying the acquired knowledge to creating solutions to problems and beyond.

An Alpha Explorer on such a journey will enjoy the learning experience, and develop interest, perhaps even a passion, for the subject, leading to a mastery of techniques to enable them to solve problems optimally and achieve better performance in the subject as opposed to mere rote-learn and squeeze the maximum score they can achieve in the examinations. The Alpha Exploration Program is not for everyone; only those who wish to embark on the Alpha Exploration Journey of Experiential Discovery need to join us.

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Program Content

- Differentiation and Derivatives of Functions
- Tangents, Normals and Rates of Change
- Maxima and Minima Problems
- Integration and Indefinite Integrals
- Integration and Definite Integrals
- Kinematics Problems
- Proofs in Plane Geometry

Benefits of Attendance

“We want to develop thinkers that question assumptions and hypothesis ... push boundaries” – Dr Jeff Lim

The Alpha Explorer Program was not created to be a substitute to the conventional learning tools and syllabus. It was created to be a “disruptor” to the conventional journey, to awaken the sense in participants to a whole new world of exploration and to challenge the current “thinking process”, thereby encouraging participants to push themselves to new heights of exploration leading to new perspectives to view the world, and in turn encourage participants to adopt a life-long journey of continued exploration and achievement!

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Who should attend?

The Alpha Explorer Program is designed to develop thinkers, it is meant for

- those who want to “own” the tools and know-how
- students, parents, professionals with the desire to fully appreciate mathematics
- those who want to “get the grades”

Anyone who is embarking on their continued Part 2 learning journey in the GCE or IGCSE ‘O’ Level Additional Mathematics program and who is serious to journey with us to discover true underlying foundations and the Why’s, and who want to be able to understand how solutions should be created in a step-by-step logical manner.

This Exploration Program is also suitable for anyone else who wishes to gain a true understanding of the Part 2 topics in a typical GCE or IGCSE ‘O’ Level Additional Mathematics program, but who may not be interested in taking the examinations, but rather interested in the acquisition of knowledge and be able to take on further exploration in higher mathematics which can be applied to the real world.

Alpha Guide-in-Chief

Dr. Jeffrey C. K. Lim, Alpha Guide-in-Chief, has an uncanny knack for taking often complicated concepts and ideas, and breaking them down to bite-sized chunks, and making such chunks understandable to a general audience, using his secret approach that starts from scratch, which is summarized by his famous guiding quotation: “The Secret of the How’s is actually in the Why’s”.

Professionally, Jeff is a certified Financial Risk Manager (FRM¹) and certified Professional Risk Manager (PRM²), is currently the Managing Director of PI ETA Consulting Company, a Treasury & Financial Risk Management Consulting Company.

A Chartered Scientist (C.Sci.³), a Chartered Mathematician (C.Math.⁴) and an elected Fellow of the Institute of Mathematics and Its Applications (IMA), U.K. (FIMA), Jeff earned his Ph.D. in Stochastic Financial Modeling from the University of Cambridge in England. Jeff’s research interest at Cambridge was in the area of Arbitrage Opportunities occurring in the Mispricing of Financial Options, and his original research culminated in the publication of his doctoral dissertation entitled: “Multi-period Mean-Variance Option Portfolio Strategies”.

Jeff was an authorized Securities & Financial Derivatives Representative in London, having been certified by The Securities and Futures Authority (SFA) in England, where he started his career as a

¹ The *Financial Risk Manager* (FRM) designation is awarded by The Global Association of Risk Professionals (GARP), U.S.A.

² The *Professional Risk Manager* (PRM) designation is awarded by The Professional Risk Managers International Association (PRMIA), U.S.A.

³ The *Chartered Scientist* (C.Sci.) designation is awarded by The Science Council, U.K.

⁴ The *Chartered Mathematician* (C.Math.) designation is awarded by The Institute of Mathematics and Its Applications (IMA), U.K.

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Derivatives Analyst with Nomura International in London, England. He subsequently joined NatWest Markets from London, England to become its Head of Currency Structured Products for South and South-East Asia. Jeff then moved to American Express Bank to become its Director of Structured Products, prior to assuming his current position.

Jeff has also contributed to the development and enhancement of talent and infrastructure for Singapore's financial center as a guest Professor at the National University of Singapore's Center for Financial Engineering, where he was responsible for the curriculum of its Master of Science degree program's core modules in Financial Derivatives and Treasury Management. In addition, Jeff has also been invited by the Nanyang Technological University and the Singapore Management University to share his expertise in a similar capacity. In recognition of Jeff's expertise and experience in the field of Treasury and Financial Risk Management, the University of New South Wales Asia appointed Jeff to be its first Adjunct Professor with the university's Division of Business and Humanities.

At PI ETA Consulting Company, Jeff was Principal Inventor in two of the Patents that the company currently holds – one in Treasury & Financial Risk Management Systems, and the other in Knowledge Management Systems.

Professionally, Jeff is a Fellow of both The Global Association of Risk Professionals (GARP), U.S.A. and The Professional Risk Managers International Association (PRMIA), U.S.A. He is also a Fellow of the Cambridge Philosophical Society, U.K. and a Life-time Member of The Cambridge Society, U.K. Jeff is also honoured to be a Fellow of The Cambridge Commonwealth Society, U.K., having been previously awarded the Cambridge Commonwealth Trust and the Shell Group of Companies Doctoral Research Scholarship.

As a special recognition of Jeff's professional achievements, on 9 April 1999, Barons Who's Who conferred Jeff with the Barons Fellowship status, making him a Barons Fellow (B.Fel.). This award by their Charter, is limited to only the top 10% of those selected for publication in Barons Who's Who International.

For more information, please contact Financial Markets Simulation Centres (FMSC) at
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