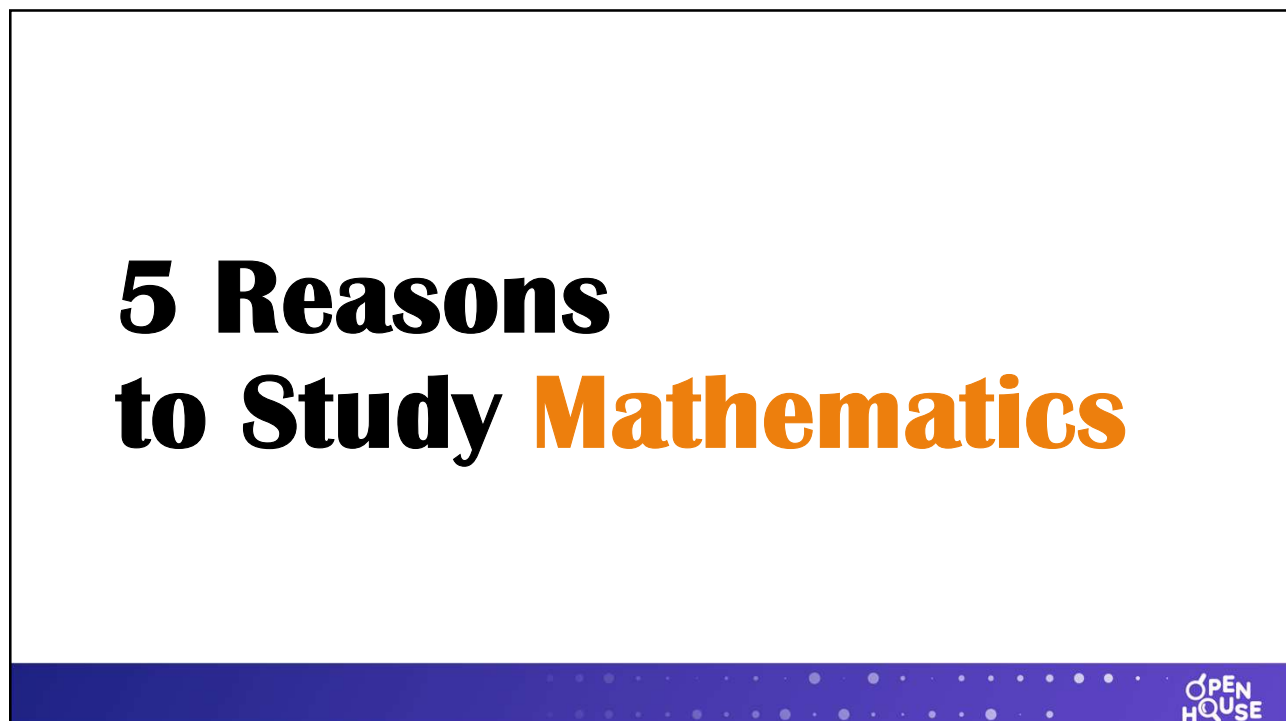**NUS** | College of Humanities and Sciences
National University of Singapore

OPEN HOUSE
4TH MARCH 2023

Mathematics in NUS:
A Door that Opens to Many Possibilities

Professor Victor Tan
Dept of Mathematics

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5 Reasons
to Study Mathematics

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#1
Finding Good Jobs

Doing the Math to find the Good Jobs

THE WALL STREET JOURNAL.
WSJ.com

CAREERS | JANUARY 26, 2009, 11:20 A.M. ET

Doing the Math to Find the Good Jobs
Mathematicians Land Top Spot in New Ranking of Best and Worst Occupations in the U.S.

By SARAH E. NEEDLEMAN

Nineteen years ago, Jennifer Courter set out on a career path that has since provided her with a steady stream of lucrative, low-stress jobs. Now, her occupation -- mathematician -- has landed at the top spot on a new study ranking the best and worst jobs in the U.S.

"It's a lot more than just some boring subject that everybody has to take in school," says Ms. Courter, a research mathematician at mental images Inc., a maker of 3D-visualization software in San Francisco. "It's the science of problem-solving."

The study, released Tuesday from CareerCast.com, a new job site, evaluates 200 professions to determine the best and worst according to five criteria inherent to every job: environment, income, employment outlook, physical demands and stress. CareerCast.com is published by Adicio Inc., in which Wall Street Journal owner News Corp. holds a minority stake.)

The findings were compiled by Les Krantz, author of "Jobs Rated Almanac," and based on data from the U.S. Bureau of Labor Statistics and the Census Bureau, as well as studies from trade association... Krantz's own expertise.

- **Income**
- **Employment outlook**
- **Physical demands**
- **Stress**
- **Environment**

CareerCast.com

...t because they... ...ndoors and in places free of toxic fumes or noise -- unlike those toward the ...l bricklayer. They also aren't expected to do any heavy lifting, crawling or crouching -- attributes associated with occupations such as

...measuring each job's median income and growth potential. Mathematicians' annual income was pegged at $94,160, but Ms. Courter,

...gns mathematically based computer programs, some of which have been used to make films such as "The Matrix" and "Speed Racer." ...time or feels stressed out. "Problem-solving involves a lot of thinking," says Ms. Courter. "I find that calming."

Other jobs at the top of the study's list include actuary, statistician, biologist, software engineer and computer-systems analyst, historian and sociologist.

CareerCast – Best jobs

https://www.careercast.com/jobs-rated

1. Statistician
2. Medical Services Manager
3. Operations Research Analyst
4. Information Security Analyst
5. Data Scientist
6. University Professor
7. Mathematician
8. Software Engineer
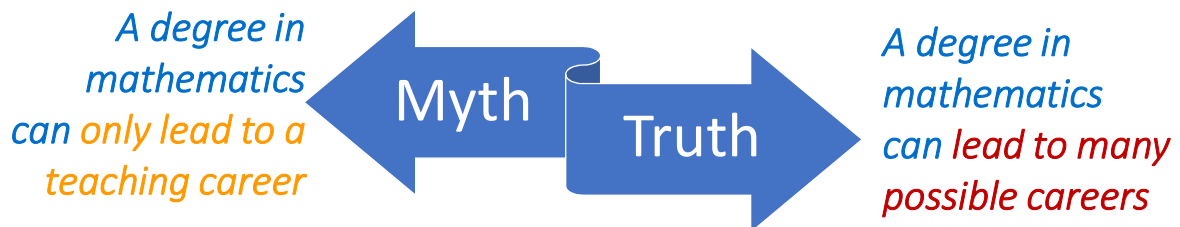9. Occupational Therapist
10. Speech Pathologist

1. Genetic Counselor
2. Mathematician
3. University Professor
4. Occupational Therapist
5. Statistician
6. Medical Services Manager
7. Data Scientist
8. Information Security Analyst
9. Operations Research Analyst
10. Actuary

1. Data Scientist
2. Statistician
3. University Professor
4. Occupational Therapist
5. Genetic Counselor
6. Medical Services Manager
7. Information Security Analyst
8. Mathematician
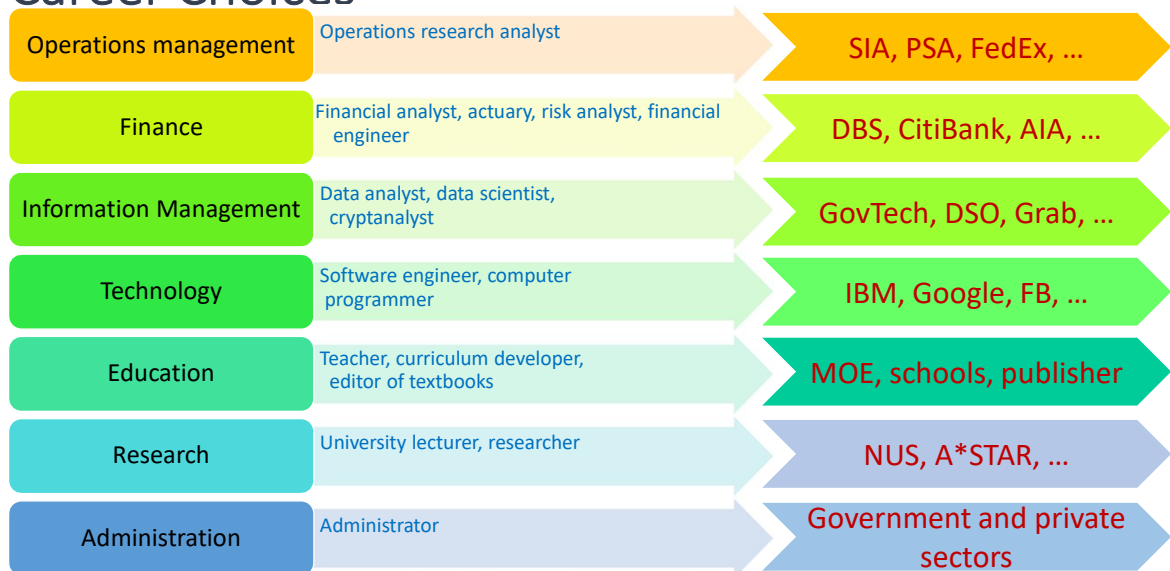9. Operations Research Analyst
10. Actuary

#2
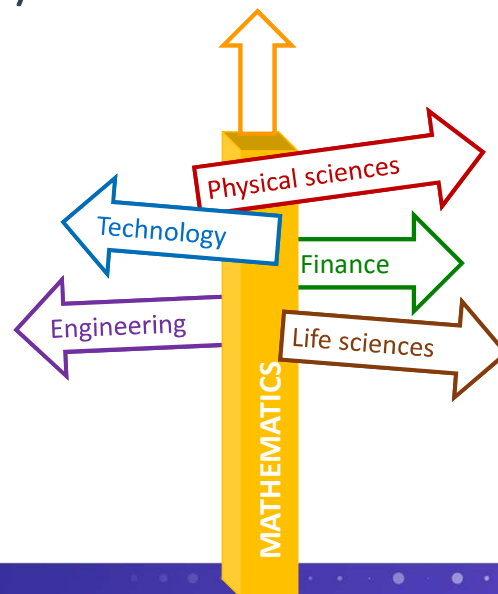# Wide Range of Career Choices
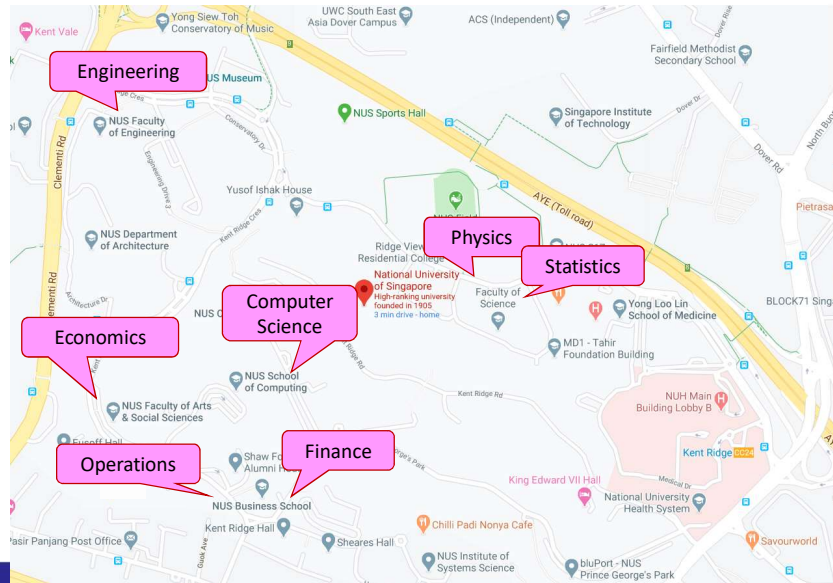
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Myth Versus Truth

A degree in mathematics can only lead to a teaching career

Myth

Truth

A degree in mathematics can lead to many possible careers

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Career Choices

Operations management	Operations research analyst	SIA, PSA, FedEx, …
Finance	Financial analyst, actuary, risk analyst, financial engineer	DBS, CitiBank, AIA, …
Information Management	Data analyst, data scientist, cryptanalyst	GovTech, DSO, Grab, …
Technology	Software engineer, computer programmer	IBM, Google, FB, …
Education	Teacher, curriculum developer, editor of textbooks	MOE, schools, publisher
Research	University lecturer, researcher	NUS, A*STAR, …
Administration	Administrator	Government and private sectors

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#3
Multiple
Pathways

Paving the ways

Professors in NUS Trained in Math

#4
Myriads of
Real World
Applications

Solving Real World Problems

Number theory, cryptology

Graph theory, linear algebra

Black-Scholes model, Monte Carlo simulation

Data mining, pattern recognition

Computer graphics, differential equations

Dynamical systems/turbulence

Integral geometry, Fourier analysis

Wavelets, numerical analysis

Combinatorics, statistics

Search Engines

Confiden-tiality

Options valuation

Human genome

Visual effect

Weather forecast

MRI/CAT imaging

Ocean modelling

Drug design

Example: Search Engine

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↑

Matrix

↑

Linear Algebra

#5
Life Long Learning Skills

Intangible Skills
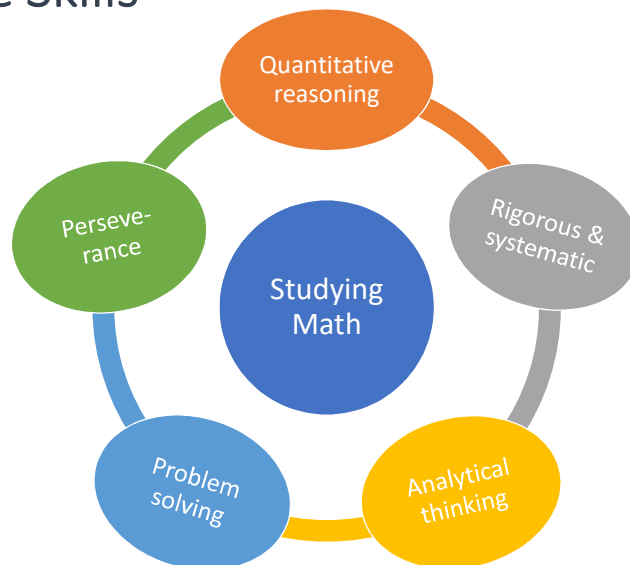
Successful people wi degree

Steve Ballmer
Microsoft Former CEO

Sergey Brin
Google Co-founder

Reed Hastings
Netflix CEO

Indra Nooyi
CEO of PepsiCo

Eric Yuan
Zoom CEO

Mathematics
Programme
in NUS

Mathematics
Statistics
Quantitative Finance
Data Science and Analytic
Data Science and Economics

Mathematics Programme

4-year honours degree programme

How to apply?
Select "NUS – Humanities & Sciences" as one of your course of choices
Once accepted to CHS, you can declare Mathematics as major

You need a good H2 pass or equivalent in Mathematics or Further Mathematics.

Mathematics Programme

- Offers a wide range of pure and applied math modules and a broad spectrum of mathematical research activities
- Includes the study of mathematical methods and problem-solving techniques that are applied in science and other disciplines
- 3 Specializations (optional):
    a. Data Modelling and Analytics
    b. Operations Research and Analytics
    c. Pure Mathematics

Math Module Requirement

1 Gateway Module

- MA1100 Basic Discrete Mathematics
- ➤ MA1100T Basic Discrete Mathematic

6 Essential Modules

- MA2001 Linear Algebra I
- MA2002 Calculus
- MA2101 Linear Algebra II
- MA2104 Multivariable Calculus
- MA2108 Mathematical Analysis I
- MA2116 Probability

1 Project Module

- MA4198 Mathematics Capstone Project

7 Elective Modules (sample)

- MA3206 Set Theory
- MA3210 Mathematical Analysis II
- MA3211 Complex Analysis I
- MA3218 Applied Algebra
- MA3220 Ordinary Differential Equations
- MA3252 Linear and Network Optimization
- MA3259 Mathematical Methods in Genomics
- MA3236 Nonlinear Programming
- MA3264 Mathematical Modeling
- MA3265 Introduction to Number Theory
- etc

Math with Specialization

5 additional modules at 4000 level

Pure Mathematics

MA4203 Galois Theory
MA4207 Mathematical Logic
MA4221 Partial Differential Equations
MA4229 Fourier Analysis and Approximation
MA4262 Measure and Integration
MA4271 Differential Geometry in Curves and Surfaces
MA4273 Algebraic Geometry in Curves and Surfaces

Operations Research and Analytics

MA4235 Graph Theory
MA4251/ST4238 Stochastic Processes II
MA4254 Discrete Optimisation
MA4260 Stochastic Operations Research
MA4264 Game Theory
MA4270 Data Modelling & Computation

Data Modelling and Analytics

MA4229 Fourier Analysis & Approximation
MA4230 Matrix Computation
MA4255 Numerical Methods in Differential Equations
MA4261 Coding and Cryptography
MA4268 Mathematics for Visual Data Processing
MA4270 Data Modelling & Computation

DDP and DMP

Many other DDP/DMP combinations

- Double Degree Programme: Computer Science and MA

- Double Major Programmes:

    MA + Second Major

    | Management (Biz) |
    | Business Analytic (SoC) |
    | Computer Science (SoC) |
    | Information Security (SoC) |

How to apply?   Direct Admission

Select "NUS – Humanities & Sciences" as one of your course of choices
Then select DDP or DMP with your choice combinations

Special Programme in Mathematics

- For selected students with strong passion and aptitude in mathematics.
- Provides in-depth study and rigorous training through specially designed modules and close mentorship.
- Students will build a firm foundation to pursue graduate programmes and future careers in the mathematical sciences

How to apply?

Not through university admission exercise
Apply from Semester 2 of the first academic year

Visit Our Website

Join us in person on Saturday 4 March 2023
@ NUS UTown

Meet our program advisors F2F
Hall 2, Stephen Riady Centre, Level 1

Homepage of
Department of Mathematics

Email:
AskMathUG@nus.edu.sg