

## Next Step in Higher education in Mathematics: Masters Degree

- Regular route: Two-year M.Sc. Program (Offered by many recognized universities, IITs, NITs etc)
- Variant-1: Two-year M.Math/M.Stat/MSQE/MSQMS Program (ISI)  
(Application process starts in February and Exam on 2nd week of May)
- Variant- 2: Integrated PhD Program after a B.Sc. (some IITs, some IISERs, IISc, CMI, TIFR, IIMSc, HRI)

## Financial assistance to pursue higher studies in Mathematics

- NBHM - Nurture Program, UG Scholarships, Masters Scholarships, PhD Scholarships and Post-doctoral Fellowships
- Kishore Vaigyanik Protsahan Yojana (KVPY) Scholarships
- Institute scholarships/stipend and tuition fee waiver
- Research Fellowships of CSIR and UGC
- DST Inspire Fellowship
- GATE Teaching Assistantship

## Selection of Areas where Mathematical Skills are applied

- Actuarial mathematics
- Biomathematics
- Bioinformatics
- Climatology
- Computer Animation and Digital Imaging
- Data Analytics
- Ecology, Epidemiology, and Environmental Issues
- Finance and Economics.

## Mathematics workshops/ training programs/internships for students

- Summer school for women at ICTS (for First year undergraduate students with mathematics as a major subject)
- Follow-up summer school (for Second year undergraduate students with mathematics as a major subject)
- Winter school for women students, conducted by Indian Women and Mathematics (IWM) (for second year and third year undergraduate students with mathematics as a major subject)
- Mathematics Training and Talent Search Programme, <https://mtts.org.in/>
- Visiting Students' Research Programme, <https://www.tifr.res.in/vsrp/>
- Summer Research Fellowship Programme by Indian Academy of Sciences, Bengaluru.
- Vigyan Vidushi program in mathematics at TIFR <http://www.math.tifr.res.in/vv.html>
- SURGE IITK Program: <https://surge.iitk.ac.in>
- Khorana Program for Scholars: <https://www.iusstf.org/program/khorana.program-for-scholars>
- IUSSTF-Viterbi Program: <https://www.iusstf.org/program/iusstf-viterbi-program>

## Further reading

### Linear Algebra

- Algebra by Michael Artin.

- Linear Algebra done right by Sheldon Axler.
- Linear Algebra by Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence.
- Linear Algebra by Kenneth Hoffman and Ray Kunze.

### **Discrete and computational geometry**

- Discrete and Computational Geometry, S. L. Devadoss, J. O' Rourke, Princeton University Press, 2011.
- Computational Geometry: Algorithms and Applications, Mark de Berg, M. van Krefeld, M. Overmars, O. Schwarzkopf, Springer, 2000.
- (More theoretical) Lectures on Discrete Geometry, Jiri Matousek, Springer, 2002.

### **Probability and Statistics**

- The Art and Science of Learning from Data by Agresti and Franklin.
- A First Course in Probability by Ross.

### **Statistics and R**

- Probability and Statistics with Examples using R by Siva Athreya, Deepayan Sarkar, and Steve Tanner  
<https://www.isibang.ac.in/~athreya/psweur/>
- The Book of R: A First Course in Programming and Statistics by Tilman M. Davies.
- Discovering Statistics Using R by Andy Field, Jeremy Miles, Zoe Field.
- Hands-On Programming with R: Write Your Own Functions And Simulations by Garrett Golemund.

### **Online resources**

- <http://ocw.mit.edu/index.htm>
- <http://in.udacity.com/>
- <http://www.coursera.org/>
- <http://nptel.ac.in/>
- <http://mooc.org/>
- <http://www.isibang.ac.in/~adean/infsys/database/index.html>
- <http://www.arvindguptatoys.com>
- <http://www.3blue1brown.com/>

### **Open Source Mathematical Softwares**

- Linear Algebra: Octave (Free version of MATLAB)
- Statistics : R
- Calculus and Geometry : Geogebra, Desmos