MATH20009: Perspectives in Mathematics

This unit will be comprised of three periods of activity, in each of which there will be a choice between a task which uses the students' maths background to develop communication or career skills, and one which gives scope for independent exploration of new mathematics.

The unit will also involve aspects of group work, peer



review and support, peer assessment, as well as presenting work orally and in written form. As these skills are important in almost any career, whether professional or academic, it is suggested that all 2nd year students seriously consider taking this course.

Adams, Colin Conrad. 1994. The Knot Book: An Elementary Introduction to the Mathematical Theory of Knots. New York: W.H. Freeman.

Andrews, George E., Richard Askey, and Ranjan Roy. 1999. Special Functions. Vol. Encyclopedia of mathematics and its applications. Cambridge: Cambridge University Press.

Anon. 2017. 'On Lexell's Theorem'. The American Mathematical Monthly 124(4). doi: 10.4169/amer.math.monthly.124.4.337.

Anon. n.d.-a. 'Ancestral Inference in Population Genetics'.

Anon. n.d.-b. 'How to Write Mathematics'.

Anon. n.d.-c. 'Netflix Prize Problem Notes'.

Apostol, Tom M. 1976. Introduction to Analytic Number Theory. Vol. Undergraduate texts in mathematics. New York: Springer.

Austin, Bill, Don Barry, and David Berman. 2000. 'The Lengthening Shadow: The Story of Related Rates'. Mathematics Magazine 73(1). doi: 10.2307/2691482.

Bhattacharya, Kaushik. 2003. Microstructure of Martensite: Why It Forms and How It Gives Rise to the Shape-Memory Effect. Vol. Oxford series on materials modelling. Oxford: Oxford University Press.

Boaler, Jo, and Carol S. Dweck. 2016. Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages, and Innovative Teaching. San Francisco: Jossey-Bass.

Brawner, James N. 2000. 'Dinner, Dancing, and Tennis, Anyone?' Mathematics Magazine 73(1). doi: 10.2307/2691486.

Doyle, Peter G. 2000. 'Random Walks and Electric Networks'.

Durksen, Tracy L., Jennifer Way, Janette Bobis, Judy Anderson, Karen Skilling, and Andrew J. Martin. 2017. 'Motivation and Engagement in Mathematics: A Qualitative Framework for Teacher-Student Interactions'. Mathematics Education Research Journal 29(2):163–81. doi: 10.1007/s13394-017-0199-1.

Falconer, K. J. 2014. Fractal Geometry: Mathematical Foundations and Applications. Third edition. Chichester, West Sussex: John Wiley & Sons Ltd.

Foulds, L. R. 1984. Combinatorial Optimization for Undergraduates. Vol. Undergraduate texts in mathematics. New York: Springer-Verlag.

Gelbaum, Bernard, and John M. H. Olmstead. 1964. Counterexamples in Analysis. Vol. The Mathesis Series. San Francisco: Holden-Day.

Graver, Jack E. and Mathematical Association of America. 2001. Counting on Frameworks: Mathematics to Aid the Design of Rigid Structures. Vol. Dolciani mathematical expositions. Washington, D.C.: Mathematical Association of America.

Grimmett, Geoffrey, and David Stirzaker. 2001. Probability and Random Processes. 3rd ed. Oxford: Oxford University Press.

Horak, Matthew. 2006. 'Disentangling Topological Puzzles by Using Knot Theory'. Mathematics Magazine 79(5). doi: 10.2307/27642974.

Houston, Kevin. 2009. How to Think like a Mathematician: A Companion to Undergraduate Mathematics. Cambridge: Cambridge University Press.

Joshua D. Laison and Michelle Schick. 2007. 'Seeing Dots: Visibility of Lattice Points'. Mathematics Magazine 80(4):274–82.

Ко

rner, T. W. 1988. Fourier Analysis. Cambridge: Cambridge University Press.

Korte, B. H., and Jens Vygen. n.d. Combinatorial Optimization: Theory and Algorithms. Vol. 21. 3rd ed. Berlin: Springer.

MICHAEL A. JONES. 2009. 'The Geometry behind Paradoxes of Voting Power'. Mathematics Magazine 82(2):103–16.

Niven, Ivan. 2014. Irrational Numbers. Cambridge: Cambridge University Press.

Rousseau, Christiane, and Yvan Saint-Aubin. 2008. Mathematics and Technology. Vol. Springer undergraduate texts in mathematics and technology. New York: Springer.

Sam C. Saunders, N. Chris Meyer and Dane W. Wu. 1999. 'Compounding Evidence from Multiple DNA-Tests'. Mathematics Magazine 72(1):39–43.

SIEHLER, JACOB. 2010. 'How Long Until a Random Sequence Decreases?' Mathematics Magazine 83(5). doi: 10.4169/002557010x529798.

Silverman, Joseph H., and John T. Tate. 2015. Rational Points on Elliptic Curves. Vol. Undergraduate texts in mathematics. Second edition, enlarged and updated. Cham: Springer.

Thomas J. Pfaff and Max M. Tran. 2009. 'Series That Probably Converge to One'. Mathematics Magazine 82(1):42–49.

Tufte, Edward R. 1997. Visual Explanations: Images and Quantities, Evidence and Narrative. Cheshire, Conn: Graphics Press.

Ware, Colin. 2013. Information Visualization: Perception for Design. Vol. The Morgan Kaufmann series in interactive technologies. 3rd ed. Waltham, MA: Morgan Kaufmann.

Weiner, Paul A. 2000. 'The Abundancy Ratio, a Measure of Perfection'. Mathematics Magazine 73(4). doi: 10.2307/2690980.