

MATH20009: Perspectives in Mathematics

View Online



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.

1.

Houston, K.: How to think like a mathematician: a companion to undergraduate mathematics. Cambridge University Press, Cambridge (2009).

2.

How to Write Mathematics,
https://uob-my.sharepoint.com/personal/mancs_bristol_ac_uk/Documents/htwm.pdf.

3.

Weiner, P.A.: The Abundancy Ratio, a Measure of Perfection. Mathematics Magazine. 73, (2000). <https://doi.org/10.2307/2690980>.

4.

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

5.

Horak, M.: Disentangling Topological Puzzles by Using Knot Theory. *Mathematics Magazine*. 79, (2006). <https://doi.org/10.2307/27642974>.

6.

Austin, B., Barry, D., Berman, D.: The Lengthening Shadow: The Story of Related Rates. *Mathematics Magazine*. 73, (2000). <https://doi.org/10.2307/2691482>.

7.

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

8.

Brawner, J.N.: Dinner, Dancing, and Tennis, Anyone? *Mathematics Magazine*. 73, (2000). <https://doi.org/10.2307/2691486>.

9.

Joshua D. Laison and Michelle Schick: Seeing Dots: Visibility of Lattice Points. *Mathematics Magazine*. 80, 274–282 (2007).

10.

MICHAEL A. JONES: The Geometry behind Paradoxes of Voting Power. *Mathematics Magazine*. 82, 103–116 (2009).

11.

On Lexell's Theorem. *The American Mathematical Monthly*. 124, (2017). <https://doi.org/10.4169/amer.math.monthly.124.4.337>.

12.

SIEHLER, J.: How Long Until a Random Sequence Decreases? *Mathematics Magazine*. 83,

(2010). <https://doi.org/10.4169/002557010x529798>.

13.

Boaler, J., Dweck, C.S.: *Mathematical mindsets: unleashing students' potential through creative math, inspiring messages, and innovative teaching*. Jossey-Bass, San Francisco (2016).

14.

Durksen, T.L., Way, J., Bobis, J., Anderson, J., Skilling, K., Martin, A.J.: Motivation and engagement in mathematics: a qualitative framework for teacher-student interactions. *Mathematics Education Research Journal*. 29, 163–181 (2017). <https://doi.org/10.1007/s13394-017-0199-1>.

15.

Ware, C.: *Information visualization: perception for design*. Morgan Kaufmann, Waltham, MA (2013).

16.

Tufte, E.R.: *Visual explanations: images and quantities, evidence and narrative*. Graphics Press, Cheshire, Conn (1997).

17.

Korte, B.H., Vygen, J.: *Combinatorial optimization: theory and algorithms*. Springer, Berlin. <https://doi.org/10.1007%2F3-540-29297-7>.

18.

Foulds, L.R.: *Combinatorial optimization for undergraduates*. Springer-Verlag, New York (1984).

19.

Falconer, K.J.: *Fractal geometry: mathematical foundations and applications*. John Wiley &

Sons Ltd, Chichester, West Sussex (2014).

20.

Netflix Prize problem notes,

https://uob-my.sharepoint.com/personal/mancs_bristol_ac_uk/Documents/Netflix%20prize%20problem.pdf?slrid=1f6a1b9e-b026-4000-7aa2-edb69d56df80.

21.

Gelbaum, B., Olmstead, J.M.H.: Counterexamples in analysis. Holden-Day, San Francisco (1964).

22.

Andrews, G.E., Askey, R., Roy, R.: Special Functions. Cambridge University Press, Cambridge (1999).

23.

Ko

rnner, T.W.: Fourier Analysis. Cambridge University Press, Cambridge (1988).

24.

Bhattacharya, K.: Microstructure of martensite: why it forms and how it gives rise to the shape-memory effect. Oxford University Press, Oxford (2003).

25.

Adams, C.C.: The knot book: an elementary introduction to the mathematical theory of knots. W.H. Freeman, New York (1994).

26.

Graver, J.E., Mathematical Association of America: Counting on frameworks: mathematics to aid the design of rigid structures. Mathematical Association of America, Washington,

D.C. (2001).

27.

Niven, I.: Irrational Numbers. Cambridge University Press, Cambridge (2014).

28.

Apostol, T.M.: Introduction to analytic number theory. Springer, New York (1976).

29.

Silverman, J.H., Tate, J.T.: Rational points on elliptic curves. Springer, Cham (2015).

30.

Grimmett, G., Stirzaker, D.: Probability and random processes. Oxford University Press, Oxford (2001).

31.

Ancestral Inference in Population Genetics,
https://link.springer.com/content/pdf/10.1007/978-3-540-39874-5_1.pdf.

32.

Rousseau, C., Saint-Aubin, Y.: Mathematics and technology. Springer, New York (2008).
<https://doi.org/10.1007/978-0-387-69216-6>.

33.

Doyle, Peter G.: Random Walks and Electric Networks. (2000).