

Further Mathematics Conference

The Wesley, London

www.thewesley.co.uk/

Saturday 3rd March 2018

- 09.00 – 09.30 Tea/coffee on arrival
- 09.30 – 10.30 Introduction and Keynote: *Sue de Pomerai + Robert Bowles*
- 10.30 – 10.50 Tea/coffee
- 10.50 – 11.40 Parallel session 1
- a. Introduction to teaching Pure in AS Further Maths - *Toby Rome*
 - b. Introduction to teaching statistics in FM - *Cath Moore*
 - c. Use of technology in Further Maths - *Tom Button*
 - d. Differential Equations – *Val Pritchard*
 - e. Groups – *Keith Proffitt*
- 11.50 – 12.40 Parallel session 2
- a. Setting up/sustaining FM provision - *Cath Moore + ACs*
 - b. Problem Solving in Further Maths - *Chris Saker*
 - c. Modelling and practical work in mechanics in FM - *Sue de Pomerai*
 - d. Using GeoGebra to teach matrices/transformations – *Catherine Berry*
 - e. Further Pure with Technology - *Tom Button*
- 12.40 – 13.40 Lunch
- 13.40 – 14.30 Parallel Session 3
- a. Introduction to teaching mechanics in FM - *Sharon Tripconey*
 - b. Introduction to teaching discrete maths in FM - *Jeff Trim*
 - c. Ideas to enrich your Further Maths lessons - *Avril Steele*
 - d. Vector Geometry - *Luciano Rila*
 - e. Encouraging/promoting Maths and Further Maths to GCSE students – *James Morris*
- 14.30 – 14.50 Tea/coffee
- 14.50 – 15.45 Moving Maths – *Ben Sparks*

Session details

09.30 – 10.30 Introduction and Keynote

The importance of offering Further Mathematics, including universities' perspectives

Sue de Pomerai (FMSP) and Robert Bowles (UCL)

The keynote will focus on why studying Further Maths is vital for many students. We will look at the data on numbers of students studying AS/A level Maths/Further Maths and highlight the support that the FMSP can offer schools and colleges.

We will also look at the importance of Further Maths for university progression and hear from a university admissions tutor.

10.50 – 11.40 Parallel session 1

1a – Introduction to teaching Pure in AS Further Maths

Toby Rome

Although the content of an AS level Further Mathematics course can vary according to the options chosen by schools and colleges, there is a compulsory core of pure topics common to all awarding organisations. This session will consider some of the main teaching points of this compulsory content and explore possible teaching approaches.

Who this session is suitable for:

Teachers who are new to Teaching Further Mathematics or those with limited experience of teaching the topics in AS FM Pure and wish to refresh their knowledge.

1b – Introduction to teaching statistics in FM

Cath Moore

This session will contain an overview of the similarities and differences in the statistics content of the new Further Mathematics A levels and look at some of the topics covered within them, using some suggested teaching strategies.

Who this session is suitable for:

Teachers who are new to the Statistics elements of Further Mathematics or those who wish to refresh their knowledge

1c – Use of technology in Further Maths

Tom Button

This session will look at ideas for integrating technology into the teaching of complex numbers, vectors, differential equations, polar coordinates and matrices. There will be an opportunity to try using GeoGebra and Graphical Calculators. Delegates are requested to bring a laptop, tablet or smartphone with GeoGebra installed to the session. Graphical Calculators will be provided.

Who this session is suitable for:

Teachers with some experience of teaching the pure maths content of Further Mathematics who wish to integrate the use of technology into their lessons.

1d – Differential Equations

Val Pritchard

Differential equations form essential background for STEM degree courses. Key techniques, which go beyond separation of variables, are included in the compulsory part of A level Further Maths. Applications can bring the topic alive in such examples as motion with air resistance, resonance and predator-prey models. In this session we will consider three main topics: the integrating factor, second order differential equations and coupled differentials equations.

Who this session is suitable for:

Teachers who have an awareness of solving differential equations by separating variables and wish to develop their knowledge and teaching, especially in phrasing explanations and choosing interesting applications.

1e – Groups

Keith Proffitt

This topic is included in Further Maths specifications because it serves as an introduction to undergraduate maths – it provides a playground for proof, makes links between different parts of maths and introduces some key concepts. We shall look at some examples of groups as well as the key idea that makes this such a powerful and exciting topic – isomorphism.

Who this session is suitable for:

Teachers who are new to teaching the groups topic in Further Maths or those who have some experience and would like to refresh their knowledge.

11.50 – 12.40 Parallel session 2

2a – Setting up/sustaining FM provision

Cath Moore + FMSP Area Coordinators

In this session we will consider different strategies and approaches for setting up and sustaining the provision of AS/A level Further Mathematics, especially in schools/colleges with low numbers of students. There will also be an opportunity to discuss your plans for offering Further Maths with FMSP staff and hear about the support the available.

Who this session is suitable for:

Teachers from schools/colleges who are in the process of setting up AS/A level Further Mathematics. This session is also suitable for teachers from schools/colleges where FM is already offered but the number of students is small and/or FM is under threat.

2b – Problem Solving in Further Maths

Chris Saker

In this session we will demonstrate how some short but rich problem solving activities can be easily incorporated into teaching Further Pure Mathematics and identify some of the key teaching skills required to do this. The session will focus on matrices but include reference to sources that cover the full range of topics for Further Pure Mathematics.

Who this session is suitable for:

Teachers who have some experience of teaching the Pure maths elements of Further Maths and want some ideas to introduce problem solving into their lessons.

2c – Modelling and practical work in mechanics in FM

Sue de Pomerai

Easy ways to spice up Further Maths mechanics lessons and help students develop deeper understanding of mechanics concepts using short, easy practicals and mathematical modelling tasks.

Who this session is suitable for:

All teachers of mechanics in Further Maths who want additional ideas for implementing practical and modelling approaches into lessons.

2d – Using GeoGebra to teach matrices/transformations

Catherine Berry

This session will look at using GeoGebra to explore matrices and transformations in 2D and 3D, extending to the application of matrices to explore intersecting planes. Delegates are requested to bring a laptop or tablet with GeoGebra installed to the session.

Who this session is suitable for:

Teachers with some experience of teaching matrices in Further Maths who would like to explore using GeoGebra to demonstrate the concepts

2e – Further Pure with Technology

Tom Button

FPT is an MEI A level Further Mathematics option in which software is used in the teaching, learning and assessment. It includes graphing, solving differential equations and programming. This session will describe the innovative approach to using technology in the learning and assessment of FPT as well as looking at some classroom materials. Delegates are requested to bring a laptop with GeoGebra installed on it to the session.

Who this session is suitable for:

Teachers of MEI A level Further Maths who are considering offering this option to their students or any teachers of Further Maths on other specifications who are interested in this development.

13.40 – 14.30 Parallel Session 3

3a – Introduction to teaching mechanics in FM

Sharon Tripconey

All students now study mechanics as part of their AS or A level in Mathematics in which they are introduced to the fundamental concepts of motion and force. This session will consider how these key concepts are incorporated and developed in Further Mathematics at AS and A level. The session will include activities to promote discussion and reflection.

Who this session is suitable for:

Teachers who are new to teaching the mechanics elements in Further Mathematics or those who wish to gain an overview of how mechanics is developed within Further Mathematics. The session is suitable for teachers who are familiar with the M1 content (legacy specifications) but have not yet taught content beyond M1 which features in the new specifications for Further Mathematics.

3b – Introduction to teaching discrete maths in FM

Jeff Trim

This session will look at the place of Discrete Maths in the new Further Maths A levels and compare the content across the four Awarding Organisations along with an opportunity to try some engaging practical activities.

Who this session is suitable for:

Teachers who are new to teaching the Discrete Maths elements in Further Mathematics or those who wish to gain an overview of how Discrete Maths is developed within Further Mathematics.

3c – Ideas to enrich your Further Maths lessons

Avril Steele

This session provides the opportunity to look again at the Further Mathematics topic of complex numbers and how this links to a range of other topics across the Mathematics and Further Mathematics curriculum. It is a 'hands on' session with several useful classroom activities and teaching approaches. Delegates are asked to bring along a laptop or device with GeoGebra software installed.

Who this session is suitable for:

Teachers who have some experience of teaching the pure maths elements of Further Maths and want some further ideas to enrich their lessons.

3d – Vector Geometry

Luciano Rila

Vector geometry was formerly in FP3 but now is part of the compulsory content of the new A level Further Maths specs. Using scalar and cross products as basic tools, this session will cover problems involving intersection, distances and angles between lines and planes. We will also discuss the use of props and technology to support teaching and learning.

Who this session is suitable for:

Teachers who are new to teaching the vector geometry topic in Further Maths or who have some experience and would like to refresh their knowledge.

3e – Encouraging/promoting Maths and Further Maths to GCSE students

James Morris

This session will consider activities that can be used in GCSE Maths lessons to provide students the opportunity to try aspects of A Level Further Maths. In this session you will have the opportunity to engage with stimulating resources that can be used with students so that they want to study Further Maths post 16. The workshop will also suggest other resources that can be used in pre 16 Maths to engage students with mathematics beyond the GCSE curriculum.

Who this session is suitable for:

All teachers of GCSE mathematics who wish to promote the study of AS/A level Further Maths to their students.

14.50 – 15.45 Plenary

Moving Maths

Ben Sparks

An exploration of the emotional side of mathematics, including how the use of dynamic (moving) software can fundamentally change the way we think about the subject. A chance to (re)visit some old classics and some new surprises.