

# SIGMA workshop

Mathematics and Statistics support for Economics and Finance

Faculty of Management - Bournemouth University

# Our journey together

**12:00 Arrival, registration and lunch**

**12:30** Welcome, David Bowers (Chair, sigma Network for Excellence in Mathematics and Statistics Support)

**12:45** What is special about maths and statistics for Economics and Finance? (Bournemouth University staff)

**13:30** Different resources for supporting mathematics and statistics skills in Economics and Finance, Francis Duah (University of York) and Martin Greenhow (Brunel University).

**14:20** An Introduction to the Q-Step initiative, Steve Grundy (Programme Manager - Q-Step, the Nuffield Foundation)

**14:45 Coffee & Networking.**

**15:15** Showcase and open discussion on attendees own teaching approaches and experiences of offering maths support to Economics and Finance students, with the opportunity to share good practice and reach out for advice.

**16:15** Action planning. How can I apply today's insights to my own teaching or maths support provision? What future collaborative/developmental activities would be useful?

**16:30 Closing remarks**

# Welcome!

~> Marta Disegna,  
E-mail: [disegnam@bournemouth.ac.uk](mailto:disegnam@bournemouth.ac.uk)



Unit leader:

- Basic Statistical Techniques, first year BA students, Accounting, Finance and Economics framework.
- Mathematics for economists, second year BA students, BA Economics and BA Finance and Economics
- Financial Econometrics, MSc Finance

Leader of the Math & Stat Clinic support centre together with [Dr Zara Ghodsi](#).

## Challenge 1

I feel like you over explain things and make the models harder than it is. not everyone on this course has done A Level Maths.

(Second year students, Mathematics for Economists 2017/18)

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Level 4 students (first year) enrolled in September 2017 with a maths certificate (including A-level) 43%

Level 4 students (first year) enrolled in September 2017 with A-level in math 35%

# Math & Stat Clinic support centre

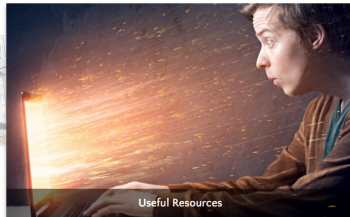
☎ make use of the **Math & Stat Clinic**'s drop-in sessions freely available each week.



## Math & Stat Clinic

Support site

[Home](#) [About Us](#) [Classes and Timetables](#) [Workshops](#) [Learning Resources](#) [Useful Resources](#) [Contact us](#)



## Challange 2

In Lecture Slides please use **more examples and less equations**. Notes about math are difficult to revise from. In seminar solution slides, please provide working out to help understand how answers are given.

(Second year students, Mathematics for Economists 2016/17)

Need **more practice questions**!

(First year students, Basic Statistical Techniques 2016/17)

I want **more exercise** for practice.

(First year students, Basic Statistical Techniques 2017/18)

## Challenge 2...BUT

Sometimes too many examples are used in the powerpoint after concept is understood, so I tend to switch off.

(First year students, Basic Statistical Techniques 2017/18)



## Challenge 3

Wheel like things could be explained in simpler terms, I am really struggling with this module. Slides and content is overcomplicated and hard to understand.

Lectures are too complicated.

Could be simplified a lot. (know this by prior knowledge of this subject.)

Make seminars more teacher-led.

(Second year students, Mathematics for Economists 2017/18)

# Software used in my units

First year student use **Microsoft Excel**



Second year students (Mathematics for Economists unit)  
and Master student use **R**



# Why do we need to use R?

To make this unit **more exiting** and to help you to **increase your probability to find a good job!**

- (1) It supports 11,413 free packages which adds muscle to R for data science and analysis (CRAN figure as on September, 2017).
- (2) R can perform various data analysis and data science tasks for free.
- (3) R is one of the highest paid IT skill and holds large share in advanced analytics software (Source: LinkedIn Skills, O'Reilly Survey).
- (4) New statistical and machine learning algorithms are implemented in R much more quicker than any other statistical tool as R is the first choice of researchers.

# Who use R?

## Tier and IT companies:



## Financial Institutions:

★ American Express, ANZ, Bank of America, Barclays Bank, Allianz Insurance, HSBC, JP Morgan, Lloyds Banking, Goldman Sachs, Morgan Stanley, etc.

## Financial Institutions:

★ AC Nielsen, IBM, Deloitte Consulting

For the full list of companies using R see [100 free tutorials for learning R](#)



is the first and foremost leader in Data Science Education, offering skill-based training, pioneering technical innovation, and courses from the world's best educators.

An **online class** has been established per each unit and as soon as students join the group, they have **full access** to the entire DataCamp course curriculum for the whole term (6 months)

# The “Help Me Formulas”

Students generally complain with the amount of formulas they need to memorise when attending quantitative subject like statistics, econometrics and mathematics and the “Help Me Formulas” is an effective way to reduce amount of complains increasing students satisfaction



## What is the “Help Me Formulas” paper?

In the following you will find a square in which you can write any formulas that you want. Print the page on a **A4 paper** (no zoom in is allowed!) and fill in the square as best as you can!

Be aware: no words/sentences are allowed; only one side can be used; **only formulas written by hand** on your own are allowed (no print or scan versions are allowed).

## “Help Me Formulas” paper

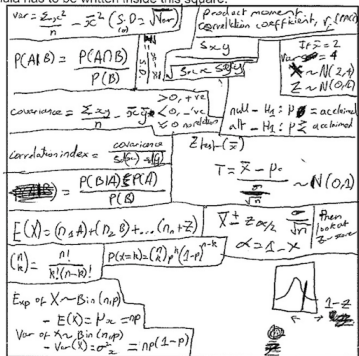
Every formula has to be written inside this square:



## The “Help Me Formulas”: examples

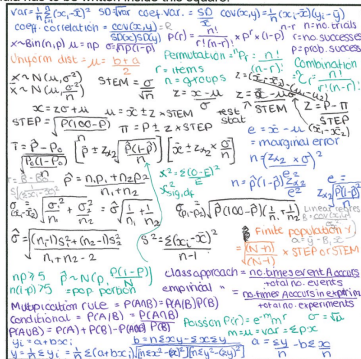
**“Help Me Formulas” paper**

Every formula has to be written inside this square:



### “Help Me Formulas” paper

Every formula has to be written inside this square:



## Challenge 4

lectures are often dragging and hard to follow  
as **not made interesting.**  
All the content is there and marks is knowledgeable  
but not delivered in a way that is **interesting**  
and **engaging.**

(First year students, Basic Statistical Techniques 2016/17)





**What do you need to play?** any device (laptop, tablet or smartphone)

**When the quiz has been used?** To check the weekly homework, to solve exercises during the lecture, to test students preparation during the lecture.

## Challenge 5

my ~~two~~<sup>three</sup> biggest concerns are the explanation of the topics, the second thing is that ~~we~~<sup>we</sup> wanted to know how some of these ~~many~~ skills would be helpful in my future career. ~~The last~~

(First year students, Basic Statistical Techniques 2016/17)

# Statistics in...

Examples of statistics in:

- politics
- finance
- medicine
- every day life
- in the Ads
- court

have been presented but...

# Statistics in ...BUT

...The average attendance rate of first year student (Basic statistical techniques) is still **dramatically low**: 15% on average, max observed 24% during the last lecture dedicated to revision.



...The average attendance rate of second year student (Mathematics for Economists) is **much much better** (did they learn something from the first year??): 61% on average, max observed 69% in the middle of the unit.

# The challenge 1

The first half of both Math and Stat units are **boring**!

In Basic Statistical Techniques we learn probability, discrete and continuous random variables, sampling distribution and then we have fun with inference, linear regression model and time series

In Mathematics for Economists we revise set theory, algebra, matrix algebra, graph and function on one variable, limits, single variable derivatives and then we have fun with optimization, functions on several variables and system of equations

Students get bored, they miss lectures and they don't have the instrument to understand what is next...

Could be better to present the final problem first and then present each necessary tool to solve it?

# The challenge 2

How to engage students who don't want to be engaged?