Assessment MATH 4753

In this course your grade is made up of a number of components.
There is NO alternate assessment – this is IT! Any parts missed cannot be made up. All assignments must be done before the due date and placed in the appropriate dropbox on CANVAS.

1. Assignments 4 equal valued (Total of 15%)
2. Laboratory (Total of 10%)
    a. Max of 16 Lab reports (10/16 = 5/8% each) 10%
    b. Grades allotted through drop-boxes and Rubrics
3. Project 10% (Get started ASAP)
4. Clicker Quizzes 10% (GET your clicker asap and practice)
5. Chapter online CANVAS quizzes 5%
6. **Mid -Term Exams (Total 20%)**
7. **Final 30%**
8. **Grades: A (90s) B(80s) C(60s and 70s) D(50s) F(<50) – NO curving!!**

Office Hours: See CANVAS announcements and Homepage for office hours – these will be set in the first week.

Assignments

- There are only 4 assignments.
- Each is important to your grade.
- **ALL WORKING MUST BE SHOWN** or you will receive 0.
- You must start them early and keep at them till finished.
- Procrastination will lead to poor grades.
- You do not need to type your working – you could do the work by hand then scan the answers into pictures and then incorporate them into R markdown using `![](“image.jpg”)`. Of course the handwriting would need to be neat and readable.
- Use R markdown – for all work that is to be handed in.
- No hard copies are to be given to me for grading.
- Read the particular instructions on the Assignment question sheet.

Laboratory

- **Labs will be done in class or an assigned laboratory and finished in your own time.**
- Please be there!
- Each lab will be introduced and you will be guided into the objectives.
- There will be sufficient work for you to do within the 50min class.
- You will be given a lab task sheet on CANVAS.
- All the answers are to be put into R markdown and knit into three document forms.
- You will be given clicker questions as well, results will be published the day of the lab.
- If you do not complete the lab then you will miss out on the marks for it – these will add up, however you have a few days to complete and place answers in the dropbox.
- Each week the labs are assessed.
- It is expected that many will complete each lab and deposit the answers in the dropbox in class.
- Once the dropbox closes – that is it – you cannot deposit labs after this time.
- You will need to install Latex, R and RStudio (in that order). These are free!
- https://youtu.be/cX532N_XLIs

Project

- There are eight files you will need to make and place in the project dropbox
  - R code text file
  - Data file
  - Rmd/HTML/Word/PDF Write up
  - PPT or PDF of your presentation
  - SWF file made from BBFLASHBACK (free)
    - http://www.bbsoftware.co.uk/BBFlashBackExpress.aspx
    - If you have a mac – then you can make a .mov file (make sure it is small in size)
    - The presentation should be less than 10min
    - Make small files!!!! http://www.bbflashback.fr/BBFlashBack/Support/UserGuides/FileSize.aspx
- The project will be to analyse a data set using Simple Linear Regression (SLR)
- You can use any R packages you want PROVIDED you know how to interpret the output.
- The data set must be from a real experiment or observational study (not fake data)
- There will need to be an experimental question that you wish to answer with the analysis.
- The exact format of the write up will be given on CANVAS.
- A complete rubric used for grading the project will be placed on CANVAS.

Clicker Quizzes

- Every class and lab will have clicker questions
- Get your clicker from the bookstore asap.
- You will need to have an i>clicker2 – NO APP!
- These clickers can send text and numerical responses
- **Register your clicker ONLY on CANVAS!!**
- At the end of the semester a final total will be calculated by the following method
  - Each individual will have their marks sorted
  - The lowest x questions will be removed
  - The final mark will be the percentage correct of what remains.
  - X will be determined by taking into consideration
    - Sickness
    - Technical problems
    - The number of students attaining 100%
- You must make sure that the clicker has fresh batteries at the start of the semester.
- **It should be put on channel AB.**
- Missing a class or two will not likely change your grade (I remove the lowest x)

Chapter online quizzes

- These are made using CANVAS
- They are graded automatically
- They cover simple but important ideas that arise in the chapters of our text book.
- There will usually be 10 questions
- You will have only one chance at the quiz (no retakes) – the only exception to this is the first quiz where you have two opportunities.
- They are worth a total of 5% of your grade.

Exams

- There are two mid-term Exams.
- They do not overlap much in content
- More information on them will be given in class.
- They are worth 10% each and should be taken very seriously (New this year)

Final

- The final will cover all of the course and count 30% of your grade. (New this year)
- About 1/3 will be from the content covered in Exams 1 and 2
- About 2/3 from that which remains (probably chapters 8,10)

Homework – evaluated through the clickers (< 10%)

- Homework has no fixed assessment percentage but work assigned for hwk will be tested through the clicker system
- For example – you may be assigned a problem to work on at home in Tuesday's class and be asked questions about it in Wednesday's lab with the clickers.

General Comments

- **This course is full on!**
- You will need to work from day 1 to the Final!
- **Evaluate the course – if you really are not prepared to face up to the realities of the work load and expectations, then the course is not for you. I say this for your own benefit and success.**
- There are three broad components to the course
    - R: using this award winning and rapidly growing software. While you are not expected to be a programmer and I assume NO programming experience nonetheless there is a fairly hefty learning curve, especially at the beginning. I will attempt to ease you into this but you will need to exercise patience and determination. Frustration can be avoided by being attentive in the labs. This course is practical – you will need to learn how to use the computer to do real analyses!
    - Statistical concepts: There are a number of core statistical concepts that repeat over and over – you must acquire these and become proficient with using and applying them
    - Theory: There are a number of very important proofs that help you to understand the theory behind ideas developed. You must know how they work and understand their development. Proofs are examinable.

Syllabus:

Introduction
STATISTICS IN ACTION DDT Contamination of Fish in the Tennessee River
Statistics: The Science of Data
Fundamental Elements of Statistics
Types of Data
Collecting Data: Sampling
The Role of Statistics in Critical Thinking
A Guide to Statistical Methods Presented in This Text
STATISTICS IN ACTION REVISITED DDT Contamination of Fish in the Tennessee River—
Identifying the Data Collection Method, Population, Sample, and Types of Data

Descriptive Statistics
STATISTICS IN ACTION Characteristics of Contaminated Fish in the Tennessee River, Alabama
Graphical and Numerical Methods for Describing Qualitative Data
Graphical Methods for Describing Quantitative Data
Numerical Methods for Describing Quantitative Data
Measures of Central Tendency
Measures of Variation
Measures of Relative Standing
Methods for Detecting Outliers
Distorting the Truth with Descriptive Statistics
STATISTICS IN ACTION REVISITED Characteristics of Contaminated Fish in the Tennessee River, Alabama

Probability
STATISTICS IN ACTION Assessing Predictors of Software Defects in NASA Spacecraft Instrument Code
The Role of Probability in Statistics
Events, Sample Spaces, and Probability
Compound Events
Complementary Events
Conditional Probability
Probability Rules for Unions and Intersections
Bayes' Rule (Optional)
Some Counting Rules
Probability and Statistics: An Example
STATISTICS IN ACTION REVISITED Assessing Predictors of Software Defects in NASA Spacecraft Instrument Code

Discrete Random Variables
STATISTICS IN ACTION The Reliability of a "One-Shot" Device
Discrete Random Variables
The Probability Distribution for a Discrete Random Variable
Expected Values for Random Variables
Some Useful Expectation Theorems
Bernoulli Trials
The Binomial Probability Distribution
The Multinomial Probability Distribution
The Negative Binomial and the Geometric Probability Distributions
The Hypergeometric Probability Distribution
The Poisson Probability Distribution
Moments and Moment Generating Functions (Optional)
STATISTICS IN ACTION REVISITED The Reliability of a "One-Shot" Device

Continuous Random Variables
STATISTICS IN ACTION Super Weapons Development—Optimizing the Hit Ratio
Continuous Random Variables
The Density Function for a Continuous Random Variable
Expected Values for Continuous Random Variables
The Uniform Probability Distribution
The Normal Probability Distribution
Descriptive Methods for Assessing Normality
Gamma-Type Probability Distributions
The Weibull Probability Distribution
Beta-Type Probability Distributions