

apts.ac.uk
Academy for PhD Training in Statistics

WEEK 4: UNIVERSITY OF GLASGOW
21st – 25th August 2017

Welcome to Glasgow!

Workshop registration: Registration on Monday 21st August will take place at the University of Glasgow, in the main foyer of the Mathematics & Statistics Building, between 11.30am and 12.30pm.

You will receive your badge from the registration desk. Please wear your badge at all times. This will help with security and also help you identify fellow participants.

IT: You will be issued with a log in and password from the registration desk. Please keep a note of this for use throughout the week within the Labs in the Maths & Stats Building and for Wi-Fi access within Room 109 and Student Common Area.

There will also be internet access in your accommodation; please ask at your accommodation to be given a cable for internet access in your room and/or for the appropriate login/password for Wi-Fi access in your room and the communal areas within your accommodation.

Messages: The telephone number for colleagues or family to leave an urgent message for you during office hours is **0141 330 2940**.

Accommodation information

Queen Margaret Residences, Bellshaugh Court, Kirklee, Glasgow, G12 0PR

Travel/location: Your accommodation is based at the above address. Bellshaugh Court is situated just off Bellshaugh Road. Please click on the attached link for travel directions to the Queen Margaret Residences:

<http://www.gla.ac.uk/undergraduate/accommodation/residenceprofiles/queenmargaretresidences/traveldirectionstoqueenmargaretresidences/>

There is free car parking at the Queen Margaret Residences.

Accommodation:

- All rooms are single ensuite with linens and towels provided
- Internet access provided in each room - please ask at reception for a cable
- Wi-Fi provided in all rooms and communal areas – please ask reception for login/password
- Laundry facilities are available
- Please note all areas of the Residences are non-smoking.

Single ensuite rooms have been booked for 4 nights – Monday 21st August until Thursday 24th August (unless you have informed us otherwise).

The Queen Margaret Residences are manned 24 hrs a day; you can check-in and access your room between 9am and 5pm. Outwith these hours there are security staff in the Central Services Building who will provide you with keys to your room. Security are located in the middle of Bellshaugh Court (enter from Bellshaugh Road). Please see local map attached.

Bedrooms are available from 2pm onwards and rooms should be vacated by 10am on the day of departure.

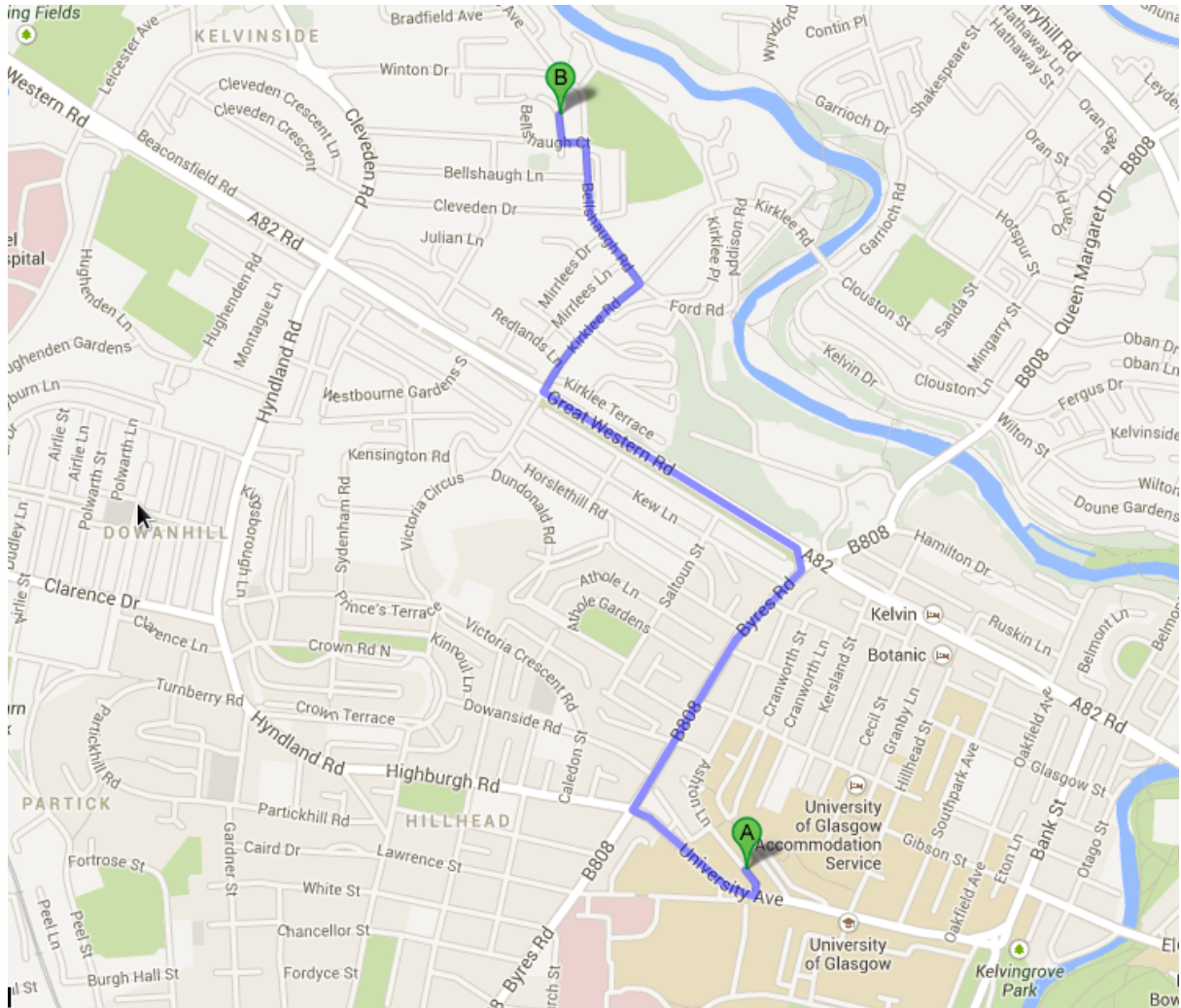
There are no facilities at this accommodation for luggage storage; however, we will provide a room in the Mathematics & Statistics Building (Room 221), University of Glasgow on Monday 21st and Friday 25th August to store your luggage. Further details will be given at Registration.

Breakfast each day will be provided at the Queen Margaret Union from 8.15am to 9.15am in the Dining Room, Tuesday - Friday.

Email access: The Residences provide data points in each room for internet access and Wi-Fi is available in all rooms and communal areas. Please ask at check-in for cables and/or Wi-Fi login/password.

Travel to APTS venue

The University of Glasgow is a short journey from your accommodation at the Queen Margaret Residences.



Queen Margaret Residences are approximately fifteen minutes' walk from the main University campus and a twenty-minute bus ride from the city centre.

The most easily accessible route from your accommodation to the Mathematics Building (at University Place, G12 8SQ) is via Great Western Road, Byres Road and then University Avenue.

Alternatively, there is a local bus route that runs along Great Western Road to the Botanic Gardens at the top of Byres Road (bus number 6/6a).

Medical and emergency information

Medical Assistance: The University Health Centre is open Monday-Friday 09.00 – 17.00.

Emergency Services and Fire Procedures: For help in an emergency dial **4444** from any internal telephone and your call will be directed appropriately. Visitors are asked to familiarise themselves with the University's fire procedures which are displayed in each bedroom.

On discovering a fire in other buildings:

Raise the alarm by breaking the glass in the nearest Break Glass Point.

On hearing the continuous ringing of the fire bells:

Stop what you are doing.

Leave by the nearest Fire Exit.

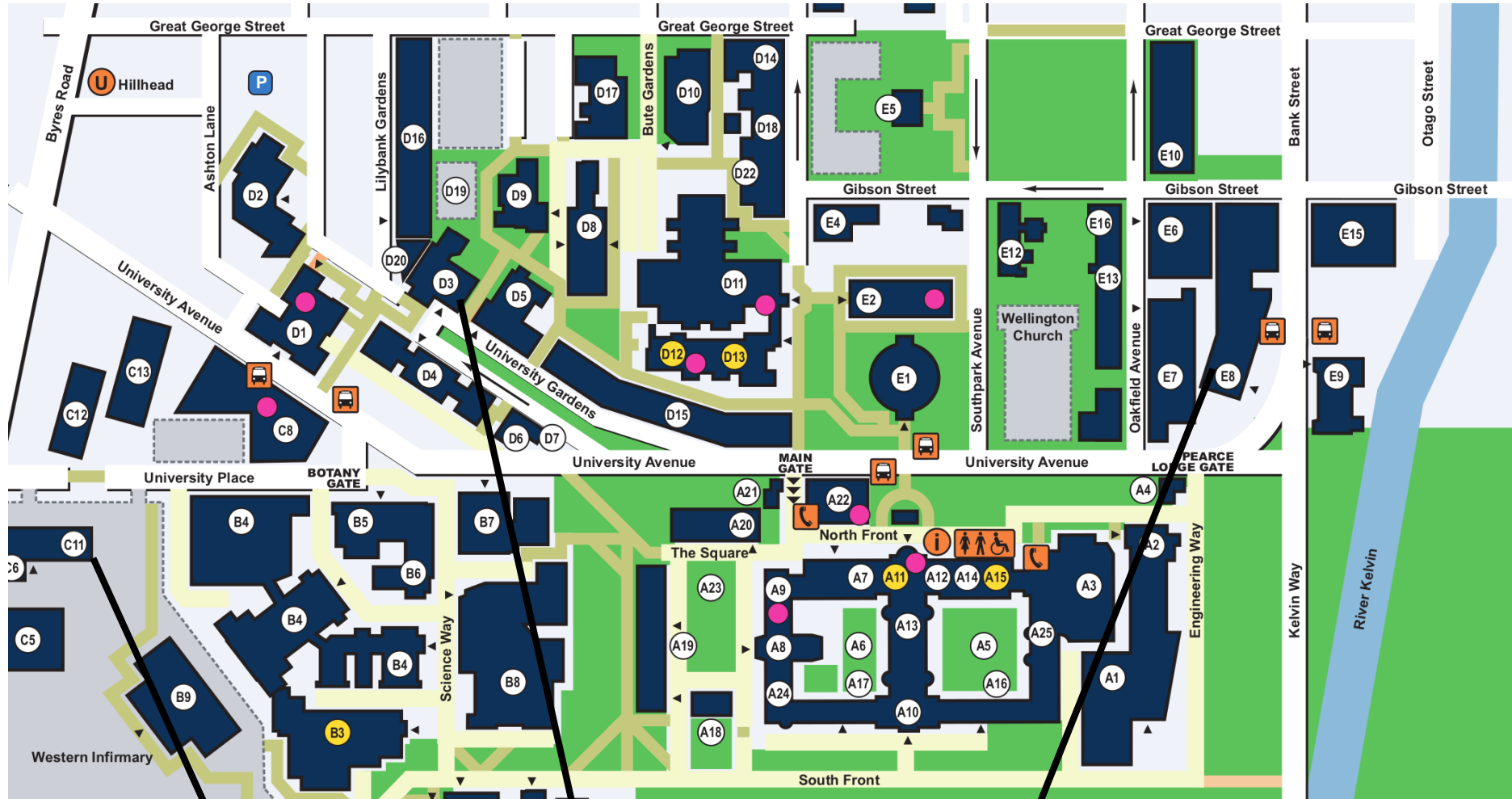
Walk calmly, do not run.

Do not stop to collect personal belongings.

Make your way to the nearest evacuation point, standing well clear of the building.

Do not re-enter the building until told to do so by the Fire Services or the University Security staff.

Campus Map



Maths & Stats Building
 (Registration)
 (Lectures & Labs)
 (Lunches)
 (Tea & Coffees)

Queen Margaret Union
 (Breakfast)

Glasgow University Union
 (Dinner)

Nonparametric smoothing

Module leader: A W Bowman and L Evers

Aims: The term 'nonparametric smoothing' refers to a wide range of methods which allow data to be modelled flexibly. The course will start with the simplest case of density estimation and progress through standard forms of nonparametric regression to state-of-the-art modelling tools which can be applied in a wide variety of settings. The course will cover the main ideas from a conceptual perspective as well as investigating aspects of the underlying theory and computation. There will also be some exploration of practical use of the methods in real applications.

Learning outcomes: By the end of the module, students will: understand the techniques of kernel density estimation and nonparametric regression, with data from one or more dimensions; appreciate the issues of bias and variance associated with model fitting and selection; be aware of the range of mechanisms which can be used to smooth data; understand how these techniques can be incorporated into wider modelling tools; be able to use these methods in a wide range of applications.

Prerequisites: Linear models, including a Bayesian approach (Modelling); generalised linear models (Modelling); R programming (preliminary APTS material); Taylor series expansions and basic concepts of asymptotic properties (Asymptotics); matrix computations (Statistical Computing).

Topics:

- kernel approaches to density estimation and regression;
- spline and basis approaches;
- computational issues;
- an insight into asymptotic properties;
- nonparametric regression;
- generalised additive models;
- alternative approaches, including Gaussian processes;
- case studies.

Assessment: A set of exercises assigned by the module leader, including a data-analysis exercise involving practical use of some of the methods covered.

Survival analysis

Module leader: I Van Keilegom

Aims: The aim of this module is to familiarize the student with the basic concepts and models in survival analysis. The mechanisms of censoring and truncation, and their impact on the estimation of basic quantities and on the development of tests are discussed. The content will also include parametric and semiparametric models which are very common in survival analysis.

Contents:

- Introduction to basic concepts (like the mechanisms of censoring and truncation, some common parametric distributions in survival analysis, ...)
- Nonparametric estimation of basic quantities (Kaplan-Meier estimator of the survival distribution, Nelson-Aalen estimator of the cumulative hazard function, ...), the development of some (asymptotic) properties of these estimators, and hypothesis testing regarding the equality of two or more survival curves
- Proportional hazards model (estimation of model components, hypothesis testing, selection of explanatory variables, model validation, ...)
- Accelerated failure time model (estimation of parameters in model, hypothesis testing, model selection, model validation, ...)
- Frailty model (introduction, motivation, estimation of model components, ...) (if time allows)

Assessment:

- Either the discussion of a research paper, which can be theoretical or applied depending on the interests of the student
- Either a mini-project involving the analysis of a dataset selected by the student

References:

- Cox, D.R. and Oakes, D. (1984). Analysis of survival data, Chapman and Hall, New York.
- Fleming, T.R. and Harrington, D.P. (1981). Counting processes and survival analysis, Wiley, New York.
- Kalbfleisch, J.D. and Prentice, R.L. (1980). The statistical analysis of failure time data, Wiley, New York.
- Klein, J.P. and Moeschberger, M.L. (1997). Survival analysis, techniques for censored and truncated data, Springer, New York.
- Kleinbaum, D.G. et Klein, M. (2005). Survival analysis, a self-learning text, Springer, New York.

APTS Timetable

| | Monday 21st August | Tuesday 22nd August | Wednesday 23rd August | Thursday 24th August | Friday 25th August | |
|---------------------|--|--|---|--|-------------------------------|-----------------------------------|
| 08:15 – 9:15 | | Breakfast – QMU | | | | |
| 09:30 – 10:30 | | Nonparametric Smoothing | Nonparametric Smoothing | Survival Analysis | Survival Analysis | |
| 10:30 – 11:00 | | | | | | Tea & Coffee – M&S |
| 11:00 – 11:30 | | Tea & Coffee Break – M&S Building | | | | Survival Analysis (Lab) |
| 11:30 – 12:30 | Registration: Maths building (Foyer) | Nonparametric Smoothing (Lab) | Nonparametric Smoothing | Survival Analysis | | |
| 12:45 – 13:45 | Lunch – M&S Bldg | Lunch – M&S Bldg | Lunch – M&S Bldg | Lunch – M&S Bldg | | |
| 14:00 – 15:00 | Nonparametric Smoothing | Survival Analysis | Survival Analysis | Nonparametric Smoothing | | |
| 15:00 – 15:30 | | | Tea & Coffee – M&S Building | | | |
| 15:30 – 16:00 | Tea & Coffee Break – M&S Building | | Survival Analysis (Lab) | Tea & Coffee – M&S Building | | |
| 16:00 – 17:00/17:30 | Nonparametric Smoothing | Survival Analysis | Free Time | | | |
| 17:30 – 18:30 | RSS Drinks Reception – M&S | | | | | |
| 18:30 – 19:30 | Dinner – GUU | Dinner – GUU | Free evening – to arrange own dinner | Dinner – GUU | | |
| Evening | | Quiz | | Ceilidh (20:00 – 23:00) | | |

GUU – Glasgow University Union

QMU – Queen Margaret Union

M&S Building – Maths & Stats Building

Timetable notes

- **Lectures** will take place in Lecture Theatre Room 116, First Floor, Mathematics & Statistics Building.
- **Computer labs** will take place in Room 117, First Floor, Mathematics & Statistics Building.
- **Breakfast** will be served in the Queen Margaret Union (QMU).
- **Tea and coffee breaks** will be served in Room 109 and Student Common Area, First Floor, Mathematics & Statistics Building.
- **Lunches** will be served in Room 109 and Student Common Area, First Floor, Mathematics & Statistics Building.
- **Dinner** will be served in the Glasgow University Union (GUU).
- **RSS Drinks Reception:** The Royal Statistical Society is kindly sponsoring a drinks reception on the early evening of Monday 21st August. This will take place in Room 109 and Student Common Area, First Floor, Mathematics & Statistics Building.
- **APTS Ceilidh:** This will take place in the Glasgow University Union after dinner on Thursday 24th August.