



## WEEK 3: UNIVERSITY OF NOTTINGHAM

4th July 2022 – 8th July 2022

---

# Welcome to Nottingham!

---

**Workshop registration:** Registration for the APTS week will take place between 11.00am and 12.30pm on Monday 4th July 2022 in Rutland Hall foyer, University Park Campus.

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.

**Luggage:** You will be able to leave luggage safely at Rutland Hall on Monday 4th July and on Friday 8th July.

**IT:** Delegates need to bring a laptop with them in order to complete the computer labs. Internet access can be obtained via the eduroam wifi network. Please make sure you are able to access eduroam at your home institution. Alternatively, you can register to use the UoN-guest wifi network.

**Accommodation location:** All residential delegates will be staying at Rutland Hall, University Park Campus (near to building 4 on the campus map)

**Car Parking:** Delegates will be able to park on campus. Please see the end of this booklet for details. There are spaces close to the the Hall.

**Your room:** Accommodation is in single rooms with either en-suite or shared bathroom facilities. All bed linen, bath towels and a toiletry pack will be provided. There are also tea and coffee making facilities in the bedrooms. You will also have wifi access.

**Checking in/out of your room:** Keys for your room can be collected when you register at Rutland Hall. If you arrive after the registration window (11.00 to 12.30 Monday 4th July) then you will be able to collect your room key from Welcome Point Central, which is located in the small cottage at the main entrance to the car park at East Midlands Conference Centre (next to Rutland Hall). A portering team will also be available during the conference, again located at Welcome Point Central.

## **Meals:**

Breakfast will be from 08.00 to 09.00 each day (Tue, Wed, Thu, Fri) in Rutland Hall dining room.

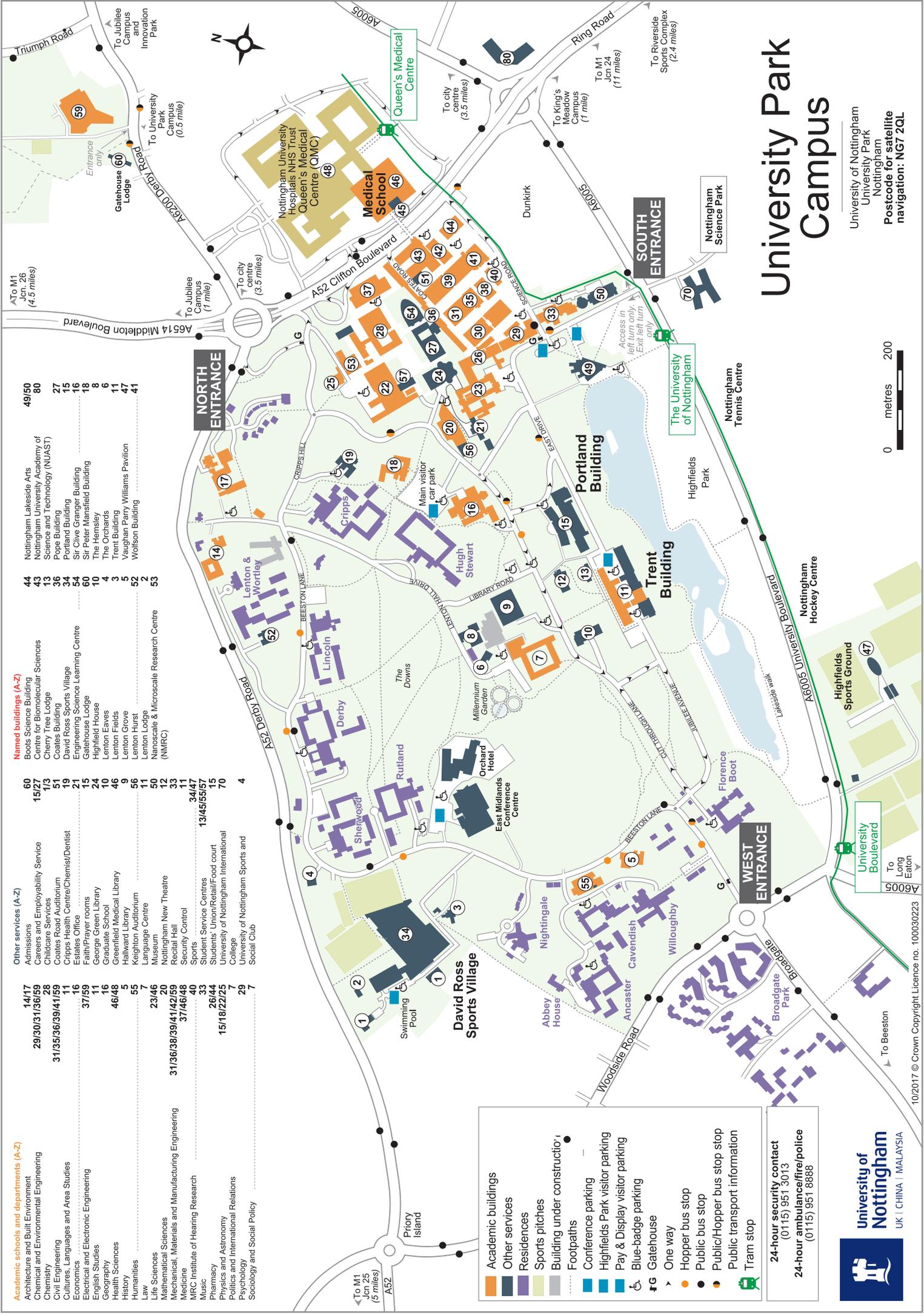
Lunch on Monday will be from 12.30 to 13.30 in Rutland Hall dining room.

Lunch on Tue, Wed and Thu will be from 13.00 to 14.00 in the foyer of the Engineering & Science Learning Centre. This is next to the room where all lectures and labs take place.

Dinner is from 18.30 to 19.30 on Mon, Tue and Wed in Rutland Hall dining room.

The Academy Dinner is on Thursday from 19.00 in Rutland Hall dining room.

**Shop/cafes/banks:** The student union shop, several cafes and cash machines can be found in the Portland Building (number 15 on the campus map). You could also walk into Beeston for more shops, pubs, cafes and cash machines (15 minute walk from West Entrance of university campus).



- Academic schools and departments (A-Z)**
- Architecture and Built Environment
  - Chemical and Environmental Engineering
  - Chemistry
  - Civil Engineering
  - Cultures, Languages and Area Studies
  - Economics
  - Electrical and Electronic Engineering
  - English Studies
  - Health Sciences
  - Geography
  - Health Sciences
  - History
  - Humanities
  - Law
  - Life Sciences
  - Mathematical Sciences
  - Mechanical, Materials and Manufacturing Engineering
  - Medicine
  - MRC Institute of Hearing Research
  - Music
  - Physics
  - Physics and Astronomy
  - Politics and International Relations
  - Psychology
  - Sociology and Social Policy

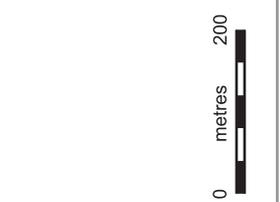
- Other services (A-Z)**
- Admissions
  - Careers and Employability Service
  - Childcare Services
  - Coates Road Auditorium
  - Cripps Health Centre/Chemist/Dentist
  - Esquires Office
  - Faith/Prayer rooms
  - George Green Library
  - Graduate School
  - Greenfield Medical Library
  - Hallgaiton Library
  - Keighiton Auditorium
  - Language Centre
  - Manufacturing Research
  - Nottingham New Theatre
  - Recliff Hall
  - Security Control
  - Sports
  - Student Services Centres
  - Students' Union/Retail/food court
  - University of Nottingham International College
  - University of Nottingham Sports and Social Club

- Named buildings (A-Z)**
- Boots Science Building
  - Centre for Biomedical Sciences
  - Cherry Tree Lodge
  - Coates Building
  - David Ross Sports Village
  - Engineering Science Learning Centre
  - Highfield Lodge
  - Highfield House
  - Lenton Eaves
  - Lenton Fields
  - Lenton Grove
  - Lenton Hurst
  - Lenton Lodges
  - Nanoscale & Microscale Research Centre (NMIRC)
  - Nottingham Lakeside Arts
  - Nottingham University Academy of Science and Technology (NUAST)
  - Pope Building
  - Portland Building
  - Sir Clive Granger Building
  - Sir Peter Mansfield Building
  - The Hemslay
  - The Orchards
  - Trent Building
  - Vaughan Parry Williams Pavilion
  - Wolfson Building

- 49/50
- 80
- 27
- 15
- 16
- 18
- 8
- 6
- 11
- 47
- 41
- 44
- 43
- 36
- 34
- 54
- 10
- 3
- 5
- 52
- 53
- 60
- 15/27
- 1/3
- 19
- 21
- 24
- 46
- 9
- 11
- 50
- 12
- 33
- 33
- 11
- 34/47
- 13/45/55/57
- 15
- 70
- 4
- 14/17
- 29/30/31/36/59
- 28
- 31/35/36/39/41/59
- 16
- 11
- 37/59
- 46/48
- 5
- 55
- 7
- 23/46
- 20
- 31/36/38/39/41/42/59
- 37/46/48
- 40
- 33
- 26/44
- 15/18/22/25
- 26
- 7

# University Park Campus

University of Nottingham  
University Park  
Nottingham  
Postcode for satellite navigation: NG7 2QL



**24-hour security contact**  
(0115) 951 3013

**24-hour ambulance/fire/police**  
(0115) 951 8888

UK | CHINA | MALAYSIA

## APTS Timetable

	Monday 4th July		Tuesday 5th July	Wednesday 6th July	Thursday 7th July	Friday 8th July
		09:30 – 11:00	High-dimensional Statistics	Computer- intensive Statistics (lab*)	High-dimensional Statistics	Computer- intensive Statistics
		11:00 – 11:30	<b>Tea &amp; Coffee</b>			
11:00 – 12:30	Registration	11:30 – 13:00	Computer- intensive Statistics	High-dimensional Statistics	High-dimensional Statistics	Computer- intensive Statistics (lab*)
12:30 – 13:30	<b>Lunch in Hall</b>	13:00 – 14:00	<b>Lunch in foyer outside lecture room</b>			
14:00 – 15:45	Welcome Computer- Intensive Statistics	14:15 – 15:45	High-dimensional Statistics	<b>Free afternoon</b>	Computer- intensive Statistics	
15:45 – 16:15	<b>Tea &amp; Coffee</b>	15:45 – 16:15	<b>Tea &amp; Coffee</b>		<b>Tea &amp; Coffee</b>	
16:15 – 17:45	High-dimensional Statistics	16:15 – 17:45	Computer- intensive Statistics		High-dimensional Statistics	
18:30 – 19:30	<b>Dinner</b>	18:30 – 19:30	<b>Dinner</b>			
Evening	<b>RSS Wine Reception (19:45 – 21:00) Dining Room</b>	Evening	<b>Pub Quiz Dining Room</b>	<b>Free evening</b>	<b>Academy Dinner (19:00 – )</b>	

**\* Please bring your own laptop for the lab sessions**

---

## Timetable Notes

---

**Location of lectures:** All APTS lectures and labs will take place in Room A09 in the Engineering & Science Learning Centre (ESLC), University Park campus (building 54 on the campus map, about a 15 minute walk from Rutland Hall).

**Tea and Coffee:** Tea and coffee will be served in the foyer area outside Room A09.

**Evening events:** The RSS reception on the Monday evening (7.45pm to 9pm) will take place in Rutland Hall dining room. On Tuesday evening there is a pub quiz in Rutland Hall dining room. The Rutland Hall bar will be open after dinner each evening, and during the Academy Dinner on Thursday.

---

## Local Information

---

**Sports facilities:** Residential conference guests are permitted access to the David Ross Sports Village (DRSV) during the APTS week (building 34 on the campus map). The swimming pool is not currently available due to refurbishment work. Guests should take their room key with them to the reception area of DRSV and they can use the gym facilities free of charge. It is also possible for guests to use the Astro turf, squash courts or tennis courts although there is a charge for these facilities. Further enquiries can be made at DRSV.

**Things to do within walking distance:**

**Wollaton Park and Wollaton Hall.** Wollaton Park is just the other side of Derby Road from Rutland Hall. It is a good location for a walk or a run.

**Highfields Park.** On the southern edge of campus, walk around the university lake or stop at the cafe and gallery at the Lakeside Arts Centre (building 49 on the map).

**Things to do in Nottingham:** You can get to Nottingham city centre using the bus (get on the number 36 along Derby Road behind Rutland Hall) or tram (get on at the university stop on the south side of the campus). Nottingham has a wide selection of shops, bars, cafes, restaurants, clubs, cinemas, theatres etc. Nottingham attractions include:

**Nottingham Castle.** A museum about Nottingham, with caves to explore.

**National Justice Museum.** Hear about crime and punishment from the Sheriff of Nottingham.

**Nottingham Contemporary.** Free modern art gallery.

**Green's Windmill.** Former home of mathematician George Green.

**Ye Olde Trip to Jerusalem.** Claims to be England's oldest inn.

**National Ice Centre.** Get your skates on.

---

## Emergency details and code of conduct

---

**Medical Assistance:** Please contact a local member of staff who will alert the appropriate services.

**Fire Procedures:** If the fire alarm sounds for more than five seconds and there has been no warning of a prolonged test, you must leave the building by the nearest emergency exit. All exits are well signed. 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.

**Code of conduct:** All delegates are expected to follow the code of conduct that is described at

[https://www.nottingham.ac.uk/academicsservices/currentstudents/  
code-of-discipline-for-students.aspx](https://www.nottingham.ac.uk/academicsservices/currentstudents/code-of-discipline-for-students.aspx)

---

## Module details

---

### Computer Intensive Statistics

**Module leader:** Dr Paul Jenkins (Warwick), Dr Richard Everitt (Warwick)

**Aims:** This module will introduce various computationally-intensive methods and their background theory, including material on simulation-based approaches such as Markov-chain Monte Carlo (MCMC) and the bootstrap, and on strategies for handling large datasets. The different methods will be illustrated by applications.

**Learning outcomes:** After taking this module, students will have a working appreciation of MCMC, the bootstrap and other simulation-based methods and of their limitations, and have some experience of implementing them for simple examples.

**Prerequisites:** Preparation for this module should include a review of:

- Familiarity with basic types of convergence of random variables: in probability, almost sure and in distribution (as for example covered in Shiryaev, 1996; or Rosenthal, 2006);
- Relevant basic material on statistical modelling (for which the earlier APTS module ‘Statistical Modelling’ would be advantageous; see also Davison, 2003);
- Basic Markov chains (as for the ‘Applied Stochastic Processes’ module; relevant further reading can be found in Shiryaev, 1996);
- Basic knowledge of programming in a high-level language such as R (R will be used for case studies and exercises). An introduction to R can be found at <http://portal.stats.ox.ac.uk/userdata/ruth/APTS2013/APTS.html>.

Further reading on prerequisite material:

- A. C. Davison (2003). *Statistical Models*. Cambridge University Press.
- J. S. Rosenthal (2006). *A First Look at Rigorous Probability Theory*, 2nd edition. World Scientific Publishing Co.
- A. N. Shiryaev (1996). *Probability*. Springer-Verlag, New York.

**Topics:**

- Overview of simulation-based inference; Monte Carlo testing.
- Basic theory of bootstrap methods; practical considerations; limitations.
- Basic theory of MCMC; types of MCMC samplers; assessment of convergence/mixing; other practical considerations; case studies.

**Assessment:** Exercises set by the module leader, which will include some practical simulation.

# High-Dimensional Statistics

**Module leader:** Dr Yi Yu (Warwick)

**Aims:** Remarkable developments in computing power and other technology now allow datasets of immense size and complexity to be collected routinely. One common feature of many of these modern datasets is that the number of variables measured can be very large, and even exceed the number of observations. In these challenging high-dimensional settings, classical statistical methods often perform very poorly or do not work at all. In this course we will look at some of the current methods for handling such data and try to understand when and why they work well.

**Learning outcomes:** After taking this module, students should be able to use analogues of many of the tools from classical statistics to analyse high-dimensional datasets. They should also be more well-placed to study and make a contribution to the growing literature on high-dimensional statistics.

**Prerequisites:** Preparation for this module should establish:

- Standard matrix algebra (not beyond that covered in the Statistical Computing module);
- Basic knowledge of real analysis and norms;
- Undergraduate level probability (no measure theory required) and statistics (e.g. maximum likelihood, the normal linear model, hypothesis tests and  $p$ -values);
- Thorough understanding of the normal linear model;
- Some basic elements of optimisation and convex analysis that will be covered in the preliminary material.

**Further reading:**

- Vershynin, Roman. High-dimensional probability: An introduction with applications in data science. Vol. 47. Cambridge university press, 2018.
- Wainwright, Martin J. High-dimensional statistics: A non-asymptotic viewpoint. Vol. 48. Cambridge University Press, 2019.

**Topics:**

- The Lasso in linear regression problems;
- De-biased Lasso;
- Graphical Lasso and graphical models;
- Fused Lasso and change point detection problems;
- Functional linear regression and reproducing kernel Hilbert spaces.

**Assessment:** Exercises with a theoretical emphasis.



Nottingham  
Conferences

### PARKING VOUCHER

Welcome to The University of Nottingham. Please ensure you have read the Terms and Conditions adjacent before parking your vehicle. We hope you have a memorable event and look forward to welcoming you back to our facilities again in the future.

EVENT TITLE:

**SCHOOL OF MATHEMATICAL  
SCIENCES - ARTS CONFERENCE**

PARKING CODE: KX27202

ARRIVAL DATE: **4 JULY 2022**  
DEPARTURE DATE: **8 JULY 2022**

VEHICLE REGISTRATION NUMBER (please complete)

--	--	--	--	--	--

PARKING ZONES:

Please refer to the University Park campus map detailing parking locations.



Nottingham  
Conferences

### TERMS AND CONDITIONS

- Your parking voucher must be printed & displayed as detailed below between 0915hr & 1600hr weekdays and within the orange parking zones as detailed on the campus map.
- Display your parking voucher face-up in a prominent position on the inside of the windscreen where all details can be clearly read from the outside of the vehicle. Please note, failure to display a paper copy of this parking voucher as detailed will result in a penalty charge notice being issued.
- The parking voucher is valid only for the event on the date/s shown and for the Vehicle Registration, the Event Title and Parking Code detailed on the face. Alternatively you can purchase a ticket and park in the designated 'Pay and Display' zones detailed on the campus map.
- The issue of a parking voucher does not guarantee the availability of a parking space and must be used in accordance with any guidance issued by the Security office.
- This parking voucher is not transferable between vehicles.
- Any damaged or defaced parking vouchers will be invalid.
- Vehicles are left entirely at owner's risk.
- It is an offence to park outside of a marked bay, in a disabled bay without an official blue badge, on yellow lines, hatched areas, grassed or landscaped areas unless directed to do so by the University of Nottingham security team.

Please fold here

Any enquiries should be addressed to:

The University of Nottingham  
Estates Security Administration Office  
Hallward Library  
University Park  
Nottingham  
NG7 2RD



The University of  
Nottingham

UNITED KINGDOM • CHINA • MALAYSIA

T: Weekdays 0800hr – 1700hr, 0115 951 3557  
T: Out of Hours and Bank Holidays, 0115 951 3013  
E: [parking@nottingham.ac.uk](mailto:parking@nottingham.ac.uk)