GSS
Learning Curriculum

- Continuing Professional Development Opportunities for Statisticians & Data Scientists

(2015/16)
About us

The Government Statistical Service

The GSS is a cross-government network, spread across a whole range of public bodies, including components of the devolved administrations and UK government departments. Led by the National Statistician, it includes statisticians, researchers, economists, analysts, operational delivery staff, IT specialists and other supporting roles. The GSS community works together to provide the statistical evidence base required by decision-makers, publishing around 2,000 sets of statistics each year, and providing professional advice and analysis to decision-makers. ONS has an important role at the heart of the GSS, providing guidance, support, standards and training.

The Government Statistical Group (GSG) is the professional body for statisticians within government. The GSS Professional Support team has produced this learning curriculum with associated CPD opportunities to benefit both the GSG and the wider GSS.

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# Table of Contents

1. Introduction.............................................................................................................4  

2. Continuing Professional Development (CPD) for Members of the Government  
   Statistician Group (GSG) ..................................................................................5  

3. Compulsory Learning for Members of the GSG.................................................6  
   3.1 Statisticians....................................................................................................6  
   3.2 Data Science..................................................................................................6  

4. Learning and Development Opportunities.........................................................7  
   4.1 ONS Statistical Short Courses......................................................................7  
   4.2 Introductory Level Data Science learning....................................................8  
   4.3 Training for Analysts who are keen to develop their Data Science skills ....9  
   4.4 GSS Good Practice Team (GPT) Courses, Workshops, Guidance and Support 10  
   4.5 Post Graduate Certificate /PG Diploma/MSc in Official Statistics ...............10  
   4.6 Other recommended Learning & Development Providers..........................11  
   4.7 Bespoke Training courses............................................................................11  
   4.8 Work based learning...................................................................................11  
   4.9 Reading/blogs/websites..............................................................................11  
   4.10 Events/Conferences/Seminars – Open to all GSS members......................12
1. Introduction

This Learning Curriculum brings together the suite of learning and development activities available to all members of the Government Statistical Service (GSS). It focuses on the development of Statistical and Data Science knowledge and skills, and is therefore relevant to all analysts who are keen to develop these skills.

The learning curriculum provides profession-specific learning for members of the Government Statistician Group (GSG) that will count towards their Continuing Professional Development (CPD). It also provides the starting point for Data Scientists recruited through the GSS and GORS route to develop their wider analytical skills and CPD.

There are a wide range of opportunities for development of an individual’s core generic skills, which are identified in the Civil Service Competency Framework, available on the Civil Service Learning portal. Learning for these skills is not covered here.

In line with the Civil Service Reform Plan, all members of the GSS are encouraged to spend at least five days a year on professional development.

Training budgets vary across departments so it is a person’s responsibility to gain approval for their learning from their line manager before booking onto activities that have an associated cost.
2. Continuing Professional Development (CPD) for Members of the Government Statistician Group (GSG)

CPD is the process of undertaking relevant learning activity to maintain and develop a person’s competencies throughout their career. This learning may develop knowledge and/or skills, may take the form of structured or un-structured learning activities, and will develop the person in both statistical/data science and non-statistical aspects.

Members of the Government Statistician Group (GSG) are expected to maintain a CPD log, which documents the amount of statistical/data science and non-statistical learning undertaken in a given year.

GSG members are broadly expected to undertake 60 – 100 hours of learning for their CPD each year, of which 30 – 50 hours should be profession specific (Statistical/Data Science). In the early stages of a career, the upper end of this guideline will generally be required.

It is recognised that in some years, an individual may focus more on generic competencies, and their statistical/data science development will therefore fluctuate. In order to take account of this, the minimum requirement for CPD is averaged over a five year period in the CPD log. Alongside this learning curriculum a CPD log (Excel) is provided for GSS and GSG members to use. Members may also record their learning through the Royal Statistical Society CPD tool (if appropriate) or use the Civil Service Learning website Personal Development Plan to record their CPD.

Prior to an interview, GSG members may be required to submit their CPD log to demonstrate how they are continuing to develop professionally.

Learning activities can take various forms including training courses, events, seminars, work-based learning, reading, further academic learning, etc.
3. Compulsory Learning for Members of the GSG

3.1 Introduction

This note sets out the compulsory learning that is expected to be undertaken by all members of the Statistical Profession within the first six months of commencing their employment. It includes:

- Assistant Statisticians;
- Statistical Officers; and
- Data Scientists.

3.2 Induction Training

3.2.1 Assistant Statisticians (those who commenced employment in 2015\(^1\))

- **Civil Service Resourcing Fast Stream Induction.** Two courses are run per year, both around Sep/Oct. A 4-day residential course; Radisson Blu Hotel, Heathrow; approx £1800. This course is managed by Civil Service Resourcing but if there are any queries, please contact gss.capability@ons.gsi.gov.uk.

- **Statistical Foundations Course.** This course should be taken within 2 to 3 months of the Fast Stream Induction course. A 3-day residential course; Holiday Inn, Wembley, London (other venues around Leeds and Newport are also being sought); £1000. Fast Streamers should automatically be enrolled onto this course but to make an enquiry, please contact statistical.training.enquiries@ons.gsi.gov.uk

3.2.2 Statistical Officers

- **GSG Induction course.** Undertaken within 2 to 3 months of commencing employment; 1.5 days; London, Leeds or Newport; non-residential; £160. To make an enquiry or to enrol (a waiting list system is in place), please contact gss.capability@ons.gsi.gov.uk

- **Statistical Foundations Course.** This course should be taken within 2 to 3 months of the GSG Induction course. A 3-day residential course; Holiday Inn, Wembley, London (other venues around Leeds and Newport are also being sought); £1000. Fast Streamers should automatically be enrolled onto this course but to make an enquiry, please contact statistical.training.enquiries@ons.gsi.gov.uk

3.2.3 Data Scientists

- **Data Science Induction Course.** Undertaken within 2 to 3 months of commencing employment\(^2\); available to all new centrally recruited Data Scientists and those who have been recruited through local/departmental recruitment exercises. A 1 day non-residential course; Etc Venues, London; £100. If you have any enquiries, please contact gss.capability@ons.gsi.gov.uk

A fuller programme of compulsory learning may be added at a later date, following discussion at the GSS People Committee.

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\(^1\) Any Statistical Fast Streamers who commenced their employment before 2015 should have already received the 1.5 day GSG Induction course. Any enquiries should be made to gss.capability@ons.gsi.gov.uk

\(^2\) The first course is due to run on 11 November 2015.
4. Learning and Development Opportunities – Statistical & Data Science

4.1 ONS Statistical Short Courses

A full list of all statistical short courses, which are delivered by the ONS at specific locations, is presented here.

Courses can however also be delivered to a department or to a group of departments, at an agreed location on request. Dates and prices for this service will need to be negotiated separately with ONS Statistical Training Services.

An annually agreed set of courses is delivered to departments with a presence in the north of England at a suitable location. Details of these are available on request.

To make an enquiry or make a booking, please email Statistical Training Services: statistical.training.enquiries@ons.gsi.gov.uk

There are two levels to the courses delivered:

- **Level 1** - Introductory Level, open to all GSS staff; no prior knowledge required
- **Level 2** - Advanced Level, open to all staff within the statistical profession or to those with a good working knowledge of the subject area

<table>
<thead>
<tr>
<th>Course</th>
<th>Length (days)</th>
<th>Location</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality and Statistics</td>
<td>1</td>
<td>ONS Newport and Titchfield</td>
<td>£111</td>
</tr>
<tr>
<td>Introduction to National Accounts</td>
<td>1</td>
<td>ONS Newport</td>
<td>£111</td>
</tr>
<tr>
<td>Administrative Data</td>
<td>1</td>
<td>ONS Newport and Titchfield</td>
<td>£111</td>
</tr>
<tr>
<td>Record Linkage</td>
<td>1</td>
<td>ONS Titchfield, ONS London</td>
<td>£111, £121</td>
</tr>
<tr>
<td>Introduction to Questionnaire Design &amp; Testing</td>
<td>1</td>
<td>ONS Newport and Titchfield, ONS London</td>
<td>£111, £121</td>
</tr>
<tr>
<td>Editing &amp; Imputation for Business surveys</td>
<td>1</td>
<td>ONS Newport</td>
<td>£111</td>
</tr>
<tr>
<td>Sample Design &amp; Estimation for Social Surveys</td>
<td>2</td>
<td>ONS Newport</td>
<td>£197</td>
</tr>
<tr>
<td>Index Numbers</td>
<td>1</td>
<td>ONS Newport</td>
<td>£111</td>
</tr>
<tr>
<td>ANOVA</td>
<td>0.5</td>
<td>ONS Newport and Titchfield, ONS London</td>
<td>£74, £79</td>
</tr>
<tr>
<td>Simple Linear Regression</td>
<td>0.5</td>
<td>ONS Newport and Titchfield, ONS London</td>
<td>£74, £79</td>
</tr>
<tr>
<td>Multiple Linear Regression</td>
<td>0.5</td>
<td>ONS Newport and Titchfield, ONS London</td>
<td>£74, £79</td>
</tr>
<tr>
<td>Introduction to Logistic Regression</td>
<td>0.5</td>
<td>ONS Newport and Titchfield, ONS London</td>
<td>£74, £79</td>
</tr>
<tr>
<td>Generalised Linear Models</td>
<td>1</td>
<td>ONS Newport and Titchfield, ONS London</td>
<td>£111, £121</td>
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<tr>
<td>Statistical Disclosure Control</td>
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<tr>
<td>Digital Dissemination</td>
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<td>£111, £121</td>
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<tr>
<td>Data Visualisation</td>
<td>1</td>
<td>ONS Newport and Titchfield, ONS London</td>
<td>£111, £121</td>
</tr>
<tr>
<td>Geography</td>
<td>1</td>
<td>ONS Titchfield</td>
<td>£111</td>
</tr>
</tbody>
</table>
Level 2: Advanced Level, open to all GSG staff or to those with a good working knowledge of the subject area

<table>
<thead>
<tr>
<th>Course</th>
<th>Length (days)</th>
<th>Location</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Editing and Imputation for Business and</td>
<td>1</td>
<td>ONS Newport</td>
<td>£111</td>
</tr>
<tr>
<td>Social Surveys</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Sample Design and Estimation for Social</td>
<td>1</td>
<td>ONS Newport</td>
<td>£111</td>
</tr>
<tr>
<td>Surveys</td>
<td></td>
<td>ONS London</td>
<td>£121</td>
</tr>
<tr>
<td>Sample Design and Estimation for Business</td>
<td>1</td>
<td>ONS Newport</td>
<td>£111</td>
</tr>
<tr>
<td>Surveys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seasonal Adjustment (X-ARIMA SEATS)</td>
<td>1.5</td>
<td>ONS Newport</td>
<td>£160</td>
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<tr>
<td>Small Area Estimation</td>
<td>1</td>
<td>ONS Titchfield</td>
<td>£111</td>
</tr>
<tr>
<td>Randomised Control Trials</td>
<td>1</td>
<td>ONS Newport and Titchfield</td>
<td>£111</td>
</tr>
<tr>
<td>Hypothesis Testing</td>
<td>1</td>
<td>ONS Newport and Titchfield</td>
<td>£111</td>
</tr>
<tr>
<td>Index Numbers</td>
<td>1.5</td>
<td>ONS Newport</td>
<td>£160</td>
</tr>
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### 4.2 Introductory Level Data Science learning

Data Scientists recruited through the joint GSS and GORS route are expected to carry out up to ten days of profession specific learning each year in the early part their careers.

**a) General coding in R**

- [CodeSchool](http://codeschool.com) **Free** online course for beginners.
- [DataCamp](https://www.datacamp.com) **Free** online course for beginners. Recommended for those who have no experience of R coding. R object types and functions are introduced thematically. Learning is in small manageable chunks and all coding is undertaken in the browser window. Other courses are available via DataCamp.

**b) Graphics in R**

- Exploratory data analysis by [Coursera](https://www.coursera.org). A **free** online course that runs every month for 4 weeks with 4-9 hours of study per week. Some R programming experience is necessary. The course provides an introduction in how to make visual representations of data using the base, lattice, and ggplot2 plotting systems in R. It applies basic principles of data graphics to create rich analytic graphics from different types of datasets, construct exploratory summaries of data in support of a specific question and create visualisations of multi-dimensional data using exploratory multivariate statistical techniques.

**c) Python**

- [CodeAcademy](https://www.codeacademy.com) **Free** online course that is estimated to take around 13 hours.
- Programming for Everybody by [Coursera](https://www.coursera.org) **Free** online course that runs every few months for 10 weeks with 2-4 hours of study per week.

**d) Machine learning**
• Machine learning by Coursera Free online course that can be done at your own pace and is estimated to take around 70 hours. The course covers: ML topics, algorithms and applications such as recommender systems, OCR, image processing, etc. It also includes good advice on how to organise your machine learning “pipeline”, how to decide the size of your test datasets, evaluate your results, etc.

e) Git - version control

• Free online course run by Udacity - How to Use Git and Github. The course can be done in your own time and gives a quick overview of Git and Github for version control. Takes about 10 hours to complete in total.

f) ODI courses

• Open Data in a Day. Learn how to discover, use and describe the benefits of open data and how they impact your organisation. This is an introductory, jargon free course that will enable you to quickly get a 360 degree view of the open data landscape and increase your confidence in working with open data. There will be costs associated with this course – for more info

• Open Data in Practice – 3 days. The course looks at the best practice involved in using and publishing open data and the legal and policy requirements in order to remove potential risks. Open Data in a Day is a suggested pre-requisite to this course. There will be costs associated with this course – for more info

4.3 Training for Analysts who are keen to develop their Data Science skills

Any of the e-learning courses listed at Introductory Level Data Science learning could be undertaken by a traditional analyst to develop basic Data Science skills.

• Open Data Institute (ODI) Basics course. This course is aimed at traditional analysts who would like to get started on data science. It introduces a few basic concepts and programming, and runs across three separate days with time in between to apply the newly learned skills. This course is currently being trialled – costs are currently £552 + VAT for 3 days of workshops. Pre-requisites:

  o Prior knowledge of programming with html and JavaScript. These e-learning courses are suggested:

    ▪ HTML
    ▪ JavaScript

  o Bring laptops that have an unlimited web browsing policy (no blocked sites or ports) and are running a copy of Google Chrome browser.
4.4 GSS Good Practice Team (GPT) Courses, Workshops, Guidance and Support

Areas covered by the GPT include:

- **Communicating Statistics** – Commentary Champions, tools and guidance on communicating statistics, access to Peer Reviews and User Panels, Improving Statistical Communication and Introduction to Data Visualisation Workshops.

- **Engaging with Users** – Working with users, User Engagement Champions.

The GPT has lots of experience of facilitating workshops on improving Statistical Commentary and Engaging with Users. If you would like the GPT to visit your department, contact the GPT at: goodpracticeteam@ons.gsi.gov.uk. All courses are free.

Keep an eye out for the GPT series of sharing seminars via their web pages.

For more information, see the GSS Good Practice Team

4.5 Post Graduate Certificate/PG/MSc in Official Statistics-Statistical

The MSc programme has been jointly developed by the University of Southampton and the GSS to cover the core skills and knowledge needed by professional government statisticians.

The programme can be taken on a full-time or part-time basis. The programme is structured as a series of modules that run in one-week slots throughout the academic year. Some modules are run at the ONS site at Newport, S.Wales and some in Southampton in the Social Statistics Research Centre at the University.

Modules can be taken as one-off modules for CPD purposes.

- PG Certificate 6 modules
- PG Diploma 12 modules
- MSc 12 modules plus dissertation


For the full suite of modules, please refer to the web link above.

To make an enquiry or to make a booking, please email Statistical Training Services: statistical.training.enquiries@ons.gsi.gov.uk
4.6 Other recommended Learning & Development Providers

- **The Royal Statistical Society** provides various courses and seminars throughout the year.
- **The Cathie Marsh Institute for Social Research**, based at Manchester University, provides a variety of courses that cover data collection and data analysis techniques.
- **CASS courses in applied social surveys**, based at Southampton University and run by the Southampton Statistical Sciences Research Institute (S3RI).
- **European Statistical Training Programme (ESTP)**, is a series of courses run by Eurostat. They are delivered either internally at Eurostat (Luxembourg) or at national training sites in the European Union (EU) and European Free Trade Association (EFTA) countries.

4.7 Bespoke Training Courses

Statistical Training Services can help to source any bespoke training needs that you or your department may have. To make an enquiry, please email statistical.training.enquiries@ons.gsi.gov.uk

4.8 Work based learning

In this section, we list some of the other development opportunities that are available to you to develop your career and contribute to your Continuing Professional Development.

- **Voluntary Sector placement scheme**
- **Secondments to external organisations**
- Secondment or loan to another government department, a policy area, an official statistic output area, etc
- Mentor or be mentored in a specific area
- Coach or secure coaching in a specific area
- Shadowing
- Visit stakeholders or end users

4.9 Reading/blogs/websites

- **E-learning resources** (non-statistical)
- **Government Digital Service blog**
- **Go Science website**
- **GSS Website**
- Follow **Statistical blogs**
4.10 Events/Conferences/Seminars – Open to all GSS members

ODI Friday Lunchtime Lecture Series. Friday lunchtime lectures are for everyone and free to attend. Take your lunch, ODI provides tea and coffee, and an interesting talk. They run from 13:00 – 13:45, with informal networking until 14:00. The lectures do not require any specialist knowledge, but are focused around communicating the meaning and impact of open data in all areas of life. See here for more info and venue. The ODI Friday lunchtime lecture series is now available to listen to and download as a podcast on iTunes or via the RSS feed.

GSS Conference – The GSS Conference is held every 18 months. The next event is being held on 17th & 18th September 2015 at the Hilton Birmingham Metropole. This year’s theme is “Innovation, Influence and Impact: Using innovative approaches to influence policy and maximize the impact of evidence”. The conference will showcase best practice, new opportunities and future directions in the world of official statistics, and aims to deliver a significant and positive impact on the work of the statistical profession with an event that addresses the most relevant issues to GSS members. Details of future conferences can be found on the GSS website.

RSS Conference – The annual RSS conference provides a unique opportunity for anyone interested in data analysis and statistics to come together to share information and network. The event is open to all statisticians and users of data. The next event is being held 7th-10th September at Exeter University. Whatever your experience, field of expertise or background, the RSS conference provides an open forum to exchange knowledge and experiences, whether in the formal conference sessions or in the many networking opportunities at refreshment breaks and evening social events. Details of future conferences and events can be found on the RSS website.

GSS Methodology Symposium – The annual Symposium features papers on completed, work in progress and future methodological work. The next event is being held in London in July 2015. This year’s theme is “Methodologies for Better Decision Making”. More information about the event is available on the symposium website. Details will be also be promoted here.

GSS Presentation and Dissemination Symposium – The Presentation and Dissemination Symposium is held every 12 – 18 months and features papers and presentations on the challenges in the fields of data science, open data, data visualisation and improving statistical releases. Presentations from the March 2015 event in Cardiff are available on the GSS website where details of future events will also be broadcast.
GSS/GES Forum - The ONS Economic Forum is a quarterly seminar that keeps key users of economic statistics better informed – about the key messages in ONS economic statistics in recent months, what methodological improvements have been made recently or are coming up, and how to interpret the change that they might bring. The Economic Forum represents a significant improvement in communications with an influential group of economic commentators and analysts.

This includes those in business, the City, academia, think-tanks, and the media, and allows users to discuss all aspects of economic statistics with ONS experts. Details of forthcoming seminars will be issued via the GSS Newsletter via the GSS website.

Various GSS workshops will be advertised throughout the year at various locations. See the GSS website for latest.

The Young Statisticians’ Meeting (YSM) - is for those in the first 10 years of their statistical career or currently studying for a PhD, MSc or BSc in Statistics or a subject with statistical content. The YSM holds an annual two-day event for career-young statisticians, organised by career-young statisticians. For further details see the GSS website.