GET IN TOUCH

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WITS School of Public Health

DIVISION OF EPIDEMIOLOGY & BIOSTATISTICS

SHORT COURSES *for* 2015

Obtain Certificate of Competence in :

- Data Collection & Capture
- Clinical Trials
- Longitudinal Data & Event History Analysis
- Chronic Disease Epidemiology
- Programming for Research Data Management
- Computing Infrastructure for Data Managers
- Health and Demographic Surveillance Database Systems
- Infectious Disease Epidemiology
- Principles of Relational Databases
- Data Processing, Distribution & Archiving
- Introduction to Data Management Systems, Structures & Models

WELCOME

The Epidemiology and Biostatistics Division offers short courses in Infectious (Communicable) Disease Epidemiology, Chronic Disease Epidemiology, Clinical Trials, Longitudinal Data and Event History Analysis and Data Collection and Capture. The courses focus on the conduct of clinical trials and the detailed understanding of epidemiology of diseases in developing countries where resources are limited, coupled with statistical analyses of data collected during clinical trials.

The division also offers short courses in Introduction to Data Management Systems, Structures and Models, Principles and Operations of Relational Databases, Health and Demographic Surveillance Database Systems, Data Processing, Distribution and Archiving, Programming, Data Collection and Capture and Computing Infrastructure for Data Managers. The courses aim to give participants the requisite tools and skills to manage public health information systems as well as large longitudinal datasets. The short courses also expose data managers to statistical techniques that are typically used to analyze the data they manage. These courses target health professionals who deal with health data management and analytics.

Data Processing, Distribution & Archiving - I

March 23 - March 28, 2015

About the Course

The course introduces participants to the Extraction, Transform and Load (ETL) process and data storage for both electronic and paper records. The course gives insight into industry standards in data documentation and data archival formats. Topics in module include Data extraction, transformation, loading (ETL) process, Analytical dataset production cycle, Data documentation: Versioning, Dataset citation, Data fingerprinting, Using Data Documentation Initiative standards, Archival data formats, Data repositories, Paper and Electronic data archiving.

By the end of the course,

- participants should be able to apply ETL processes in analytical dataset production cycle.
- participants should be able to analyze different kind of data repositorie.
- participants should be able to documemnt datasets using DDI standards, versioning, dataset citation etc.
- participants should be able to utilize data archival formats and archiving processes to create historical data repositories.

Outsiders: R 6050
From Wits: R 3025

08h30-17h30
Each Day

Data Collection & Capture

April 13 - April 18, 2015

About the Course

Data Collection is concerned with the techniques and practices of doing empirical research. After the study design has been finalised, the issue of questionnaire design and how the data will be collected, captured and validated needs to be addressed. This course provides participants with guidance on data collection and validation as well as quality assurance methods and processes. The participant will be equipped with the necessary skills for creating appropriate data collection instruments for a study.

By the end of the course,

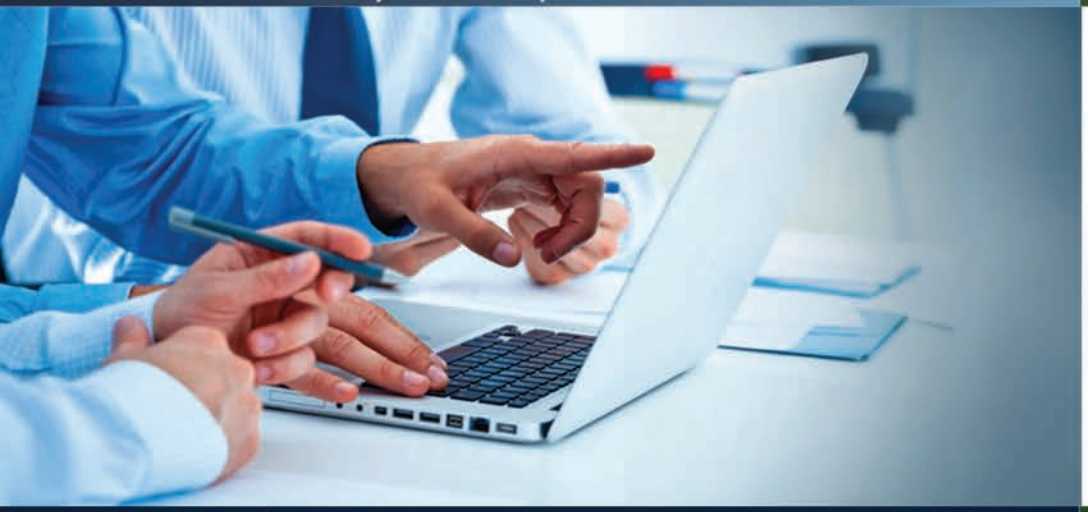
- participants should be able to develop and implement strategies for data collection and capture.
- participants should be able to develop an EDC module for a given research study using tools like REDCap.
- participants should be able to explain the need for data validation and quality assurance.
- participants should be able to develop validation programme and quality assurance plan for a given research study.

Outsiders: R 6050
From Wits: R 3025

08h30-17h30
Each Day

Computing Infrastructure for Data Managers

May 11 - May 16, 2015



About the Course

The course introduces participants to technologies deployed within data centers for public health research activities. These include facility setup, servers, storage, data-center consolidation, disaster recovery etc. Participants are introduced to key concepts and principles in the design, management and maintenance of communication systems within a data center. A walkthrough of systems configuration, monitoring and maintenance is given. The course is concluded with a critical look at emerging technologies in virtualization and the application of cloud computing in data management.

By the end of the course,

- participants should be able to set up and manage research data infrastructure.
- participants should be able to explain concepts related to security policies, security/confidentiality models etc.
- participants should be able to configure, manage and set up back systems for health datasets.
- participants should be able to explain emerging field of virtualization and the use of cloud computing in research data management.

Outsiders: R 6050
From Wits: R 3025

08h30-17h30
Each Day

Principles & Operations of Relational Databases

June 15 - June 20, 2015

About the Course

This course introduces the concept of database design and the use of database management systems to model and implement public health information systems. It includes extensive coverage of the relational model, relational algebra, and SQL, the standard language for creating, querying, and modifying relational and object-relational databases. It also covers XML data including DTDs and XML Schema for validation, and the query and transformation languages such as XPath, XQuery, and XSLT. The course equips the participants with the skills of creating, maintaining, manipulating, updating, and retrieving information/data for analysis.

By the end of the course,

- participants should be able to design and implement relational database solutions for health information systems.
- participants should be able to design and implement database interface applications for data capture and storage.
- participants should be able to manipulate and query relational databases for statistical analysis.
- participants should be able to explain current and emerging database models and technologies.

Outsiders: R 6050
From Wits: R 3025

08h30-17h30
Each Day

Infectious (Communicable) Disease Epidemiology

June 29 - July 3, 2015

About the Course

This course focuses on the principles of infectious disease epidemiology, using examples from African context. On successful completion of the course, participants will have a sound understanding of the principles of infectious disease epidemiology, a thorough knowledge of the epidemiology of key infectious diseases in Africa, such as tuberculosis, HIV/AIDS and malaria, and will be equipped with various approaches to addressing infections.

Content:

- This course covers measures of infectiousness, including reproductive rates, herd immunity, vaccine efficacy, vaccine coverage and attack rates.
- It also demonstrates infection transmission principles, using practical examples of the epidemiology of HIV/AIDS, tuberculosis, malaria, diarrheal and respiratory tract infections. Current issues in infectious disease epidemiology and eradication of infectious diseases are discussed.

Outsiders: R 6050
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08h30-17h30
Each Day

Longitudinal Data & Event History Analysis

July 6 - July 11, 2015

About the Course

Event History Analysis (EHA) has become increasingly popular in recent years as social scientists become more interested in whether and when events occur. This course will introduce participants to the purpose and principles of EHA using longitudinal (repeated measures) event data (e.g. demographic surveillance system) and statistical techniques which can model such event processes. The course is organised into sessions which encompass EHA-oriented longitudinal data management; conceptualising time, event and censoring; life tables and Kaplan-Meier analysis; and proportional hazards modeling.

By the end of the course,

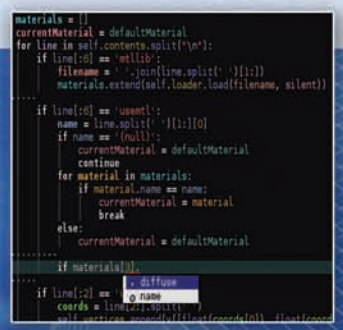
- participants should be able to acquire data collection skills for demographic retrospective surveys and demographic surveillance system (DSS).
- participants should be able to select good analytical strategies and statistical models to analyse demographic data in relation to specific research questions.
- participants should be able to perform, present and interpret the results of EHA.

Outsiders: R 6050
From Wits: R 3025

08h30-17h30
Each Day

Programming for Research Data Management - I

July 20 - July 25, 2015



About the Course

This course introduces the theory, principles and practice of programming for the purpose of developing applications to capture, store and manage data for public health research studies. This course introduces the participant to the fundamental programming techniques and algorithms needed to properly capture, store and manage these datasets. The course will focus on planning and organizing programs for information extraction from research data. Python, an open-source scripting language that allows rapid application development of both large and small software systems will be used for this course.

By the end of the course,

- participants should be able to translate formal specifications of research requirements to an algorithm that would form the basis of a solution to a computable problem.
- participants should be able to implement k-means algorithm, Apriori algorithm, EM (Expectation–Maximization) algorithm, k-nearest neighbor classification (kNN) using longitudinal datasets.
- participants should be able to apply programming principles in developing applications that connect to different data sources.

Outsiders: R 6050
From Wits: R 3025

08h30-17h30
Each Day

Health & Demographic Surveillance Database Systems

August 10 - August 15, 2015

About the Course

The course emphasis the planning, architecture, design, and implementation of databases related to public health surveillance information systems. The appropriate design and management of such information systems is particularly useful for Health and Demographic Surveillance Centers or Sites in developing countries. The course focuses on foundational techniques for managing disease surveillance and demographic databases distributed over different geographical regions. These concepts are then applied to solve the complex interrelationships of local, national and regional independent but interrelated surveillance information systems and the constraints that legal restrictions create in the transfer and use of surveillance datasets.

By the end of the course,

- participants should be able to apply the appropriate methodologies and modeling techniques in the design and development of public health surveillance databases and information systems.
- participants should be able to adopt National Electronic Disease Surveillance Standard/System (NEDSS) and Public Health Information Network (PHIN) in implementing public health surveillance system for geographically disperse regions.

Outsiders: R 6050
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08h30-17h30
Each Day

Data Processing, Distribution & Archiving - II

August 17 - August 22, 2015

About the Course

This course focuses on post archival processing, distribution and repurposing of data. It gives insight into the different techniques of data linkage and further looks at data mining and its application for research data. The participant is also equipped with the knowledge of data sharing processes and tools. Other topics to be covered in the course include data warehousing, OLAP, public data use, disclosure control, anonymization and de-identification of data, data user agreement, data distribution platforms using NoSQL distributed databases as a practical learning tool.

By the end of the course,

- participants should be able to produce a well-documented analytical dataset from disparate sources.
- participants should be able to explain data warehousing and the concepts of OLAP and data mining.
- participants should be able to publish data ensuring control authenticity and integrity of the data and provide confidentiality to sensitive data.
- participants should be able to develop a data warehouse infrastructure using NoSQL platform.

Outsiders: R 6050
From Wits: R 3025

08h30-17h30
Each Day

Chronic Disease Epidemiology

August 31 - September 4, 2015

About the Course

The burden of illness from chronic diseases is rapidly increasing worldwide and, in particular, in the developing world, facilitated by considerable lifestyle changes associated with demographic, societal and epidemiologic transitions. This course provides an introduction to the aetiology, epidemiology, risk factors and public health importance of selected chronic diseases, with particular reference to developing countries.

By the end of the course,

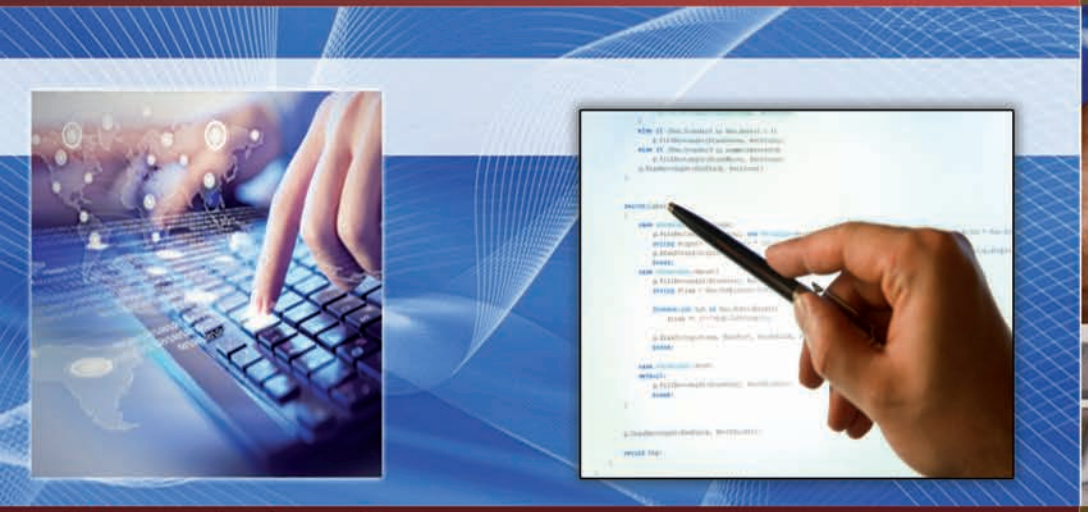
- participants should be able to understand the theories of epidemiologic transition and the development of chronic diseases.
- participants should be able to describe the social determinants and inequalities of health.
- participants should be able to describe the practice of chronic disease prevention and control.
- participants should be able to understand the relationships between major lifestyle risk factors and the role of early life experiences in the variation of disease occurrence.

Outsiders: R 6050
From Wits: R 3025

08h30-17h30
Each Day

Programming for Research Data Management - II

August 31 - September 5, 2015



About the Course

The goal of the course is to familiarize participants with Python's tools for mathematical and statistical computing. Topics covered include advanced object oriented programming with Python, File I/O and an introduction to numerical packages such as NumPy/SciPy. The second part of the module will concentrate on developing applications for networked and distributed environments. Such applications are important for managing research data for multi-site health and demographic studies.

By the end of the course,

- participants should be able to develop applications that access external aggregated data files using advance Python File I/O constructs.
- participants should be able to create data management modules and APIs for distributed environments.
- participants should be able to use mathematical and scientific tools in Python to perform data analysis.
- participants should be able to develop GUIs for database applications.

Outsiders: R 6050
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08h30-17h30
Each Day

Clinical Trials

September 7 - September 11, 2015

About the Course

The course provides an introduction to clinical trials, focusing on the conduct of clinical trials in developing countries where resources are limited. The main issues in the design, implementation and interpretation of clinical trials will be introduced to participants as well as disease prevention and control. Concepts such as ethical and methodological considerations, principles of clinical trial conduct, clinical trial organization and monitoring, data collection, data processing (data management), quality assurance and quality control, and trial reporting, will be comprehensively described. The roles of the data safety and monitoring committee (DSMB) and the community advisory board (CAB), as well as good clinical practice (GCP), will be highlighted.

This course will

- outline the principles of comparative clinical trials in investigating safety, efficacy and effectiveness of treatments.
- highlight strengths and weaknesses of clinical trial design in comparison to other study designs.
- introduce the key elements and steps in clinical trial implementation.

Outsiders: R 6050
From Wits: R 3025

08h30-17h30
Each Day

Intro. to Data Management Systems, Structures & Models

September 7 - September 12, 2015

About the Course

Research studies have unique data management requirements depending on the study design, type and frequency of data collection and reporting requirements. This course gives insight on data management systems for a selection of research studies. Participants will study data requirements, evaluate existing databases and identify an ideal data model for each of these studies. This course also investigates the use of SQL to generate data structures and schemas. Participants will be equipped with skills to generate various kinds of analytical datasets from databases and create queries to perform common analysis using SQL.

By the end of the course,

- participants should be able to understand data management systems, structures and models.
- participants should be able to design simple research database based on selected data model.
- participants should be able to query and perform basic analyses on existing databases.

Outsiders: R 6050
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08h30-17h30
Each Day

Application Deadlines

COURSES	DEADLINES
Data Processing, Distribution & Archiving - I	March 6, 2015
Data Collection & Capture	March 27, 2015
Computing Infrastructure for Data Managers	April 24, 2015
Principles and Operations of Relational Databases	May 29, 2015
Infectious (Communicable) Disease Epidemiology	June 12, 2015
Longitudinal Data & Event History Analysis (EHA)	June 19, 2015
Programming for Research Data Management - I	July 3, 2015
Health and Demographic Surveillance Database Systems	July 24, 2015
Data Processing Distribution and Archiving - II	July 31, 2015
Chronic Disease Epidemiology	August 14, 2015
Programming for Research Data Management - II	August 14, 2015
Clinical Trials	August 21, 2015
Intro. to Data Management Systems, Structures and Models	August 21, 2015

To apply, please contact

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