Training in Survey Methods

Current Practice and Looking ahead
December 1, 1990

**It Began with an Idea**

The idea for the Joint Program emerged from a 1990 initiative of the Federal Statistical agency heads, the then current head of the OMB Statistical Policy Office, and then chair of the Council of Economic Advisors. The mismatch between the disciplinary organizations of most universities and the technical staffing needs of the system required a new academic organization. The legislative initiative called for a graduate education and research center offering courses in the DC area.
Curriculum driven by Total Survey Error Framework (Groves et al. 2004)
Curriculum driven by Total Survey Error Framework (Groves et al. 2004)
The 21 month course schedule (and course credit hours) for a full time student in each of the areas of concentration are listed below.

<table>
<thead>
<tr>
<th>Term</th>
<th>Statistical Science</th>
<th>Social Science</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall, Year 1</strong></td>
<td>410: Intro Probability (3)</td>
<td>615: Stat Methods I (3)</td>
</tr>
<tr>
<td></td>
<td>615: Stat Methods I (3)</td>
<td>623: Data Collection (3)</td>
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<td></td>
<td>623: Data Collection (3)</td>
<td>632: Social and Cognitive Foun. (3)</td>
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<td>672: Introduction to the Federal Statistical</td>
<td>672: Introduction to the Federal Statistical</td>
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<td>System (1)</td>
<td>System (1)</td>
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<td></td>
<td>10 credits</td>
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<tr>
<td><strong>Spring, Year 1</strong></td>
<td>420: Intro to Stat (3)</td>
<td>616: Stat Methods II (3)</td>
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<td></td>
<td>440: Sampling Theory (3)</td>
<td>625: Applied Sampling (3)</td>
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<td>616: Stat Methods II (3)</td>
<td>630: Questionnaire Design (3)</td>
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<td></td>
<td>640: Surv Practicum I (2)</td>
<td>640: Surv Practicum I (2)</td>
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<td></td>
<td>11 credits</td>
<td>11 credits</td>
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<tr>
<td><strong>Summer, Year 1</strong></td>
<td>Internship</td>
<td>Internship</td>
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<tr>
<td><strong>Fall, Year 2</strong></td>
<td>641: Survey Practicum II (Data Analysis) (2)</td>
<td>641: Survey Practicum II (Data Analysis) (2)</td>
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<td>720: Total Survey Quality I (2)</td>
<td>701: Analysis of Complex Data (3)</td>
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<td>745: Practical Tools for Sampling and</td>
<td>720: Total Survey Quality I (2)</td>
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<tr>
<td></td>
<td>Weighting (3)</td>
<td>722: Random and Nonrandomized Research</td>
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<tr>
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<td>746: Advanced Statistical Modeling (3)</td>
<td>Design (3)</td>
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<tr>
<td></td>
<td>Elective (3)</td>
<td>746: Advanced Statistical Modeling (3)</td>
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<tr>
<td></td>
<td>13 credits</td>
<td>13 credits</td>
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<tr>
<td><strong>Spring, Year 2</strong></td>
<td>721: Total Survey Quality II (2)</td>
<td>721: Total Survey Quality II (2)</td>
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<tr>
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<td>742: Inference (3)</td>
<td>772: Design Seminar (3)</td>
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<tr>
<td></td>
<td>744: Statistical Topics in Survey Methodology (3)</td>
<td>Elective (3)</td>
</tr>
<tr>
<td></td>
<td>772: Design Seminar (3)</td>
<td>Elective (3)</td>
</tr>
<tr>
<td></td>
<td>11 credits</td>
<td>11 credits</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>45</td>
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</table>
Four developments

1. Format
2. Degree
3. Content
4. Partners
1. Format
Change of Delivery Mode

MHEC approved both Certificate programs to be moved online (master under review)
Enrollment same requirements as graduate school
Online offerings follow slightly different schedule: 4 Terms per year
   Dec-Feb,
   March-Mai,
   June-August,
   Sept-Nov;
Recordings + online office our (synchronous) + Forum
Use of videos (slightly altered) and MOODLE platform
Session 8: Questionnaire Development (AUG 20)

Topics Covered:
- Research findings on question wording, structure, and context

To Do:

Session 7: Questions and Answers in Surveys (AUG 13)

Topics Covered:
- Various means of computer assisted data collection, impact on data quality

To Do:
Table of Contents

Lists all sessions currently available to students in date order

Each entry is a link and will jump to that point on the page
Events and Activities

Upcoming Events

Lists assignments, exams, quizzes, and online discussion dates coming up for given class

Student can customize to date range

Recent Activity

Lists recent changes made by instructor to the class site
Sessions

New sessions auto-display each week

Each session includes

1. Session #: Title (Date)
2. “Topics Covered” subsection with brief description
3. “To Do” subsection

Readings
- URLs
- PDFs
  Note reference to book chapter

Adobe Connect link for online chat
- One per online chat time
- Always has date and time next to it

Discussion forum for student/instructor online interaction
- One per session

Homework
- Assignment submission portal, or
- Auto-generated and graded

Lecture link to video

Exam
- Can set time restrictions
Video-Format

Each week set of videos (pre-recorded)

Lectures are broken into easily-digestible sessions to help students to better focus on the material.

Engage with the material at their own pace: e.g., replay parts that cover difficult concepts; subtitles
There are no upcoming events
2. Degree
Master of Science in Survey Methodology


Short Course  Short Course  Short Course
Master of Science in Survey Methodology


Short Course  Short Course  Short Course

MOOC
Master of Science in Survey Methodology

Professional Master in Survey Practice


Short Course  Short Course  Short Course

MOOC  Specializations

Increasing faculty involvement
3. Content
Found/Organic Data

**Volume**

Data at Rest

Terabytes to exabytes of existing data to process

**Velocity**

Data in Motion

Streaming data, milliseconds to seconds to respond

**Variety**

Data in Many Forms

Structured, unstructured, text, multimedia

http://www.rosebt.com/blog/data-veracity
Error Framework Necessary

Volume
Data at Rest
Terabytes to exabytes of existing data to process

Velocity
Data in Motion
Streaming data, milliseconds to seconds to respond

Variety
Data in Many Forms
Structured, unstructured, text, multimedia

Veracity*
Data in Doubt
Uncertainty due to data inconsistency & incompleteness, ambiguities, latency, deception, model approximations

http://www.rosebt.com/blog/data-veracity
Data Generating Process

Data Curation/Storage

Data Analysis

Data Output/Access

Research Questions

Example: map visualization / privacy

Example: Hadoop MapReduce; High Frequency Data

Example: Record Linkage
Hadoop Distributed File System

Examples: geolocated social media + survey + administrative data

Examples: Behavior of interest (political participation/job searches)

Usher 2015
DOMAIN EXPERT
User, analyst, or leaders with deep subject matter expertise related to the data, its appropriate use, and its limitations

SYS ADMIN
Team member responsible for defining and maintaining a computation infrastructure that enables large scale computation

RESEARCHER
Team member with experience applying formal research methods, including survey methodology and statistics

COMPUTER SCIENTIST
Technically skilled team member with education in computer programming and data processing technology
... our students are ready for it
Big Data for Federal Agencies
What is the link between federal R&D and innovation?
Web Scraping

Machine Learning & Text Analysis

Networks

Link to Census and USPTO Admin data

Statistical Inference

Longitudinal Database

Visualization

Data Capture
- Structured Data (Different ways of collecting data)
- Text Data (Making use of new types of data)
- Relationship data (creating new units of economic activity)
- Output Data (Creating innovation measures)

Data Analysis
- Sense making (from the population)
- Analysis (capturing social and economic dynamics)
- Conveying information (in statistically valid context)
4. Partners
Questionnaire Design for Social Surveys
by Frederick Conrad, Ph.D., Frauke Kreuter, Ph.D.

Reach

16,521 total learners joined
183 different countries
7,103 (43%) from emerging economies
0 on Signature Track

Enrollment
Cumulative enrollment over time

Intent
Learn more about how intent is measured

Committed to Audit: 4,634
Uncommitted: 7,050

Values extrapolated based on responses from 10,491 learners. Learn more
<table>
<thead>
<tr>
<th>Continent</th>
<th>Country</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>United States</td>
<td>32%</td>
</tr>
<tr>
<td>North America</td>
<td>India</td>
<td>30%</td>
</tr>
<tr>
<td>Europe</td>
<td>China</td>
<td>25%</td>
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<tr>
<td>Africa</td>
<td>United Kingdom</td>
<td>6%</td>
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<tr>
<td>South America</td>
<td>Canada</td>
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<tr>
<td>Oceania</td>
<td>Pakistan</td>
<td>6%</td>
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<tr>
<td></td>
<td>Germany</td>
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<td></td>
<td>Brazil</td>
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<td>Spain</td>
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<tr>
<td></td>
<td>Russian Federation</td>
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<td></td>
<td>Mexico</td>
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<td></td>
<td>Australia</td>
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<td></td>
<td>Philippines</td>
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<tr>
<td></td>
<td>Greece</td>
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</tr>
<tr>
<td></td>
<td>Vietnam</td>
<td>1%</td>
</tr>
</tbody>
</table>
Gender & Age

Female
- 44% in Your Session
- 40% in Coursera

Male
- 55% in Your Session
- 60% in Coursera

Based on responses from 1,850 learners. Estimates accurate to ± 2 percentage points.

Education Status
- Full-time student: 25%
- Part-time student: 16%
- Not a student: 50%

Based on responses from 1,837 learners. Estimates accurate to ± 2 percentage points.

Highest Education Level
- Doctorate degree: 9%
- Professional school degree: 5%
- Master's degree: 40%
- Bachelor's degree: 31%
- Associate degree: 3%
- Some college but no degree: 6%
- High school diploma: 4%

Employment Status
- Employed full-time: 52%
- Employed part-time: 11%
- Self-employed full-time: 5%
- Self-employed part-time: 5%
- Unemployed and looking for work: 14%
- Unemployed and not looking for work: 8%
- Other: 5%
#international expansion

International Program in Survey Practice and Data Science - IPSM

Funding

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Federal Ministry of Education and Research

OFFENE HOCHSCHULEN

JPSM

THE JOINT PROGRAM IN SURVEY METHODOLOGY
Structure

- Students admitted to the program can choose between:
  - Enrolling into the Master’s degree program
  - Attending single courses

- 30 credits/60 ECTS (5 required courses + electives)

- 1-2 on-site components (regionally);
  regional discussion section (in different languages if needed)

- Assessment: a final exam at the end of the course + graded assignments during the class (e.g. quizzes, projects, etc.) + participation