COURSE CONTENT

Course Coordinator  Wang Wei-Siang
Course Code  HE2020
Course Title  Survey Methods and Sampling Technique
Pre-requisites  HE1004 Introduction to Statistical Theory and Methods/
                HE1005 Introduction to Probability and Statistical Inference/
                HE2004 Introductory Econometrics/
                HE2005 Principles of Econometrics/
                AB1202 Statistics & Analysis
No of AUs  3
Contact Hours  39 hours (2 hours lecture and 1 hour tutorial per week)

Course Aims
This course is designed to give you basic knowledge and concepts of sampling methods and
techniques in the social sciences. In this course, we will mostly discuss the basics of probability,
statistical and sampling theory. The mathematics is both elementary and rigorous, and it requires
as a pre-requisite the satisfactory experience of one or two years of university mathematics
courses. Topics covered in this course include discrete probability, various linear relationships,
conditional expectation, conditional (co)variance, the central limit theorem, simple random
sampling, systematic sampling, stratified sampling, cluster sampling, etc. We will also talk about
how to deal with nonresponse items and observations.

Intended Learning Outcomes (ILO)
By the end of this course, you (as a student) would be able to:

1. Apply mathematical and probabilistic methods to do statistical inference
2. Explain the basic principles underlying survey design and estimation, and differentiate between
   various probability (and nonprobability) sampling methods and tell their advantages and
   disadvantages
3. Design a survey process, identify appropriate sampling procedures and methods in a social
   science research study

Course Content

1. Probability and Statistics
2. Simple Probability Samples
3. Ratio and Regression Estimation
4. Stratified Sampling
5. Cluster Sampling with Equal Probabilities
6. Cluster Sampling with Unequal Probabilities
7. Complex Surveys
8. Nonresponse
Assessment (includes both continuous and summative assessment)

1. Class Participation : 15%
2. Problem Set : 10%
3. Quizzes : 15%
4. Final Examination : 60%
   Total : 100%

Reading and References

Textbook:
1. Sampling: Design and Analysis (2009), by Sharon L. Lohr; Duxbury Press.

Supplementary Readings

Course Instructors

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Office Location</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wang Wei-Siang</td>
<td>HSS-04-55</td>
<td>6514 1092</td>
<td><a href="mailto:wswang@ntu.edu.sg">wswang@ntu.edu.sg</a></td>
</tr>
</tbody>
</table>

Planned Weekly Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Course LO</th>
<th>Readings/ Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Introduction to Sampling Techniques</td>
<td>1-3</td>
<td>Sharon L. Lohr (2009)</td>
</tr>
<tr>
<td></td>
<td>and Survey</td>
<td></td>
<td>Chapter 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Richard J. &amp; Gouri B.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(2019) Chapter 1</td>
</tr>
<tr>
<td>3-4</td>
<td>Probability, Statistical Tests,</td>
<td>1</td>
<td>Richard J. &amp; Gouri B.</td>
</tr>
<tr>
<td>5-6</td>
<td>SRS sampling Techniques</td>
<td>1-3</td>
<td>Sharon L. Lohr (2009)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chapter 2</td>
</tr>
<tr>
<td>7-8</td>
<td>Stratified Sampling</td>
<td>1-3</td>
<td>Sharon L. Lohr (2009)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chapter 4</td>
</tr>
<tr>
<td>Recess Week</td>
<td>Chapter 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Cluster Sampling with Unequal Probabilities</td>
<td>Sharon L. Lohr (2009) Chapter 6</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Ratio and Regression Estimation</td>
<td>Sharon L. Lohr (2009) Chapter 3</td>
<td></td>
</tr>
<tr>
<td>10-11</td>
<td>Complex Surveys</td>
<td>Sharon L. Lohr (2009) Chapter 7</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Nonresponse Issues</td>
<td>Sharon L. Lohr (2009) Chapter 8</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Revision</td>
<td>1-3</td>
<td></td>
</tr>
</tbody>
</table>