1 & 2: Learning goals & Outcome measures – please list the program’s formal learning goals and associated outcomes measures

<table>
<thead>
<tr>
<th>Learning goal</th>
<th>Outcome measure(s)</th>
</tr>
</thead>
</table>
| 1. Demonstrate understanding of central statistical concepts, apply appropriate statistical methods to research questions and use appropriate software to produce reproducible results | • Homework assignments, labs and written exams  
• Successful completion of Biostatistics I with R  
• Successful completion of Categorical and Censored Data Analysis |
| 2. Manipulate, organize and visualize complex messy data efficiently and effectively and execute best practices for reproducible research as well as best coding practices | • Homework assignments, labs and written exams  
• Successful completion of Data Science I (with R and Python)  
  ▪ Additional depth with another programming language: Elective course on “Statistical Programming with SAS”  
  ▪ Additional depth in creation, organization and maintenance of databases: Elective on “Data Management” |
| 3. Understand data generating processes, pros and cons of different study designs, bias and confounding and proficiency in critically reviewing and evaluating a study | • Homework assignments, quizzes and papers  
• Successful completion of Study Design  
  ▪ Additional depth in experimental designs: Elective on Foundations in Biomedical Applications |
| 4. Understand the goals of a research problem, apply appropriate method to predict outcomes and establish causal effects of outcomes using appropriate advanced statistical and machine learning methods | • Written exams and projects  
• Homework assignments and labs  
• Successful completion of “Data Science II – Statistical Learning”  
  ▪ Additional depth in causal inference: Elective on Causal Inference  
  ▪ Additional depth in hierarchical modeling, missing data and clinical trials: Elective on Advanced Topics in Biostatistics |
| 5. Ability to develop and succeed in cross-disciplinary teams to pursue common projects | • Successful prosecution of Capstone Project |
| 6. Aware of issues and best practices in the responsible conduct of research and human subjects research | • Successful completion of CITI Responsible Conduct of Research and Biomedical Investigators courses |
| 7. Able to present data and its analysis in a | • Graded end-of-term oral presentations |
public forum, orally and in writing  (multiple courses)  
- Interim presentations of Capstone project (end of term) 
- Final presentation of Capstone project

3: **Learning assessment** – List the names of the meeting(s) that will be used to conduct learning assessment, including key participants

<table>
<thead>
<tr>
<th>Meeting title</th>
<th>Key participants (eg, program chair, program dir., course dirs., student reps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. End-of-term Education Committee meeting</td>
<td>Program Directors and staff review student progress at end of every term</td>
</tr>
<tr>
<td>2. Annual Curriculum Committee Meeting</td>
<td>Program Directors and Curriculum Committee</td>
</tr>
</tbody>
</table>

4: **Learning assessment process** – Confirm that annually the program will (a) discuss the overall approach to learning assessment (ie, in terms of learning goals, outcome measures, and review process), and (b) submit a report to the Dean of the Graduate School, summarizing the findings of the annual assessment review.

(a) Annual discussion of approach to learning assessment: CONFIRMED / NOT CONFIRMED 
(b) Annual learning assessment report to Dean: CONFIRMED / NOT CONFIRMED