S1600 #1
Syllabus; Knowledge and Data

January 12, 2016
Outline

1. Syllabus
   - Highlight of Syllabus

2. Knowledge and Data
   - Step-by-step Knowledge Building
   - Some fallacies in interpreting evidence

(WMU) S1600, Lecture 1 2 / 11
STAT1600 Home Page

- e-Learning
- Course material may also be found in www.stat.wmich.edu/wang/160
Lectures

- lecture and workshop
- 50-minute lecture
- iClicker questions for extra credit
- 25-minute hands-on workshop
- 10 points for each day’s work
- 3 lowest workshop scores will be dropped at the end of semester
Evaluation

- Daily in-class work: 200 points
- Midterm #1: 100 points
- Midterm #2: 100 points
- Final Exam: 100 points
- Total = 500 points
- iClicker extra credit = smaller value of 25 and total iClicker score.
- Exams are similar to the workshops in contents except for more questions and longer time needed to complete.
Grading Policy

First the Final Avg. is calculated by

\[
\text{Final Avg.} = \frac{\text{Total Score}}{5}
\]

Then grades are calculated based on Final Avg.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>BA</th>
<th>B</th>
<th>CB</th>
<th>C</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(\geq 85)</td>
<td>(\geq 80)</td>
<td>(\geq 75)</td>
<td>(\geq 70)</td>
<td>(\geq 60)</td>
<td>(&lt; 60)</td>
</tr>
</tbody>
</table>
Grading Policy

- First the Final Avg. is calculated by

\[
\text{Final Avg.} = \frac{\text{Total Score}}{5}
\]

- Then grades are calculated based on Final Avg.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≥ 85</td>
</tr>
<tr>
<td>BA</td>
<td>≥ 80</td>
</tr>
<tr>
<td>B</td>
<td>≥ 75</td>
</tr>
<tr>
<td>CB</td>
<td>≥ 70</td>
</tr>
<tr>
<td>C</td>
<td>≥ 60</td>
</tr>
<tr>
<td>E</td>
<td>&lt; 60</td>
</tr>
</tbody>
</table>
Grading Policy

First the Final Avg. is calculated by

\[
\text{Final Avg.} = \frac{\text{Total Score}}{5}
\]

Then grades are calculated based on Final Avg.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Minimum Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≥ 85</td>
</tr>
<tr>
<td>BA</td>
<td>≥ 80</td>
</tr>
<tr>
<td>B</td>
<td>≥ 75</td>
</tr>
<tr>
<td>CB</td>
<td>≥ 70</td>
</tr>
<tr>
<td>C</td>
<td>≥ 60</td>
</tr>
<tr>
<td>E</td>
<td>&lt; 60</td>
</tr>
</tbody>
</table>
Exam Dates

- Midterm #1: Thursday, February 11 (in-class)
- Midterm #2: Thursday, March 24 (in-class)
- Final Exam:
  - Section 10929: Tuesday, April 26, 8:00AM–10:00AM (9:30AM class)
  - Section 12249: Wednesday, April 27, 8:00AM–10:00AM (11:00AM class)
  - Section 14047: Wednesday, April 27, 2:45PM–4:45PM (12:30PM class)
  - Section 10934: Thursday, April 28, 2:45PM–4:45PM (2:00PM class)
Exam Dates

- **Midterm #1**: Thursday, February 11 (in-class)
- **Midterm #2**: Thursday, March 24 (in-class)
- **Final Exam**:
  - Section 10929: Tuesday, April 26, 8:00AM–10:00AM (9:30AM class)
  - Section 12249: Wednesday, April 27, 8:00AM–10:00AM (11:00AM class)
  - Section 14047: Wednesday, April 27, 2:45PM–4:45PM (12:30PM class)
  - Section 10934: Thursday, April 28, 2:45PM–4:45PM (2:00PM class)
Exam Dates

- Midterm #1: Thursday, February 11 (in-class)
- Midterm #2: Thursday, March 24 (in-class)
- Final Exam:
  - Section 10929: Tuesday, April 26, 8:00AM–10:00AM (9:30AM class)
  - Section 12249: Wednesday, April 27, 8:00AM–10:00AM (11:00AM class)
  - Section 14047: Wednesday, April 27, 2:45PM–4:45PM (12:30PM class)
  - Section 10934: Thursday, April 28, 2:45PM–4:45PM (2:00PM class)
Exam Dates

- Midterm #1: Thursday, February 11 (in-class)
- Midterm #2: Thursday, March 24 (in-class)
- Final Exam:
  - Section 10929  Tuesday, April 26, 8:00AM–10:00AM (9:30AM class)
  - Section 12249  Wednesday, April 27, 8:00AM–10:00AM (11:00AM class)
  - Section 14047  Wednesday, April 27, 2:45AM–4:45PM (12:30PM class)
  - Section 10934  Thursday, April 28, 2:45PM–4:45PM (2:00PM class)
Exam Dates

- Midterm #1: Thursday, February 11 (in-class)
- Midterm #2: Thursday, March 24 (in-class)
- Final Exam:
  - Section 10929  Tuesday, April 26, 8:00AM–10:00AM (9:30AM class)
  - Section 12249  Wednesday, April 27, 8:00AM–10:00AM (11:00AM class)
  - Section 14047  Wednesday, April 27, 2:45AM–4:45PM (12:30PM class)
  - Section 10934  Thursday, April 28, 2:45PM–4:45PM (2:00PM class)
Exam Dates

- Midterm #1: Thursday, February 11 (in-class)
- Midterm #2: Thursday, March 24 (in-class)
- Final Exam:
  - Section 10929  Tuesday, April 26, 8:00AM–10:00AM (9:30AM class)
  - Section 12249  Wednesday, April 27, 8:00AM–10:00AM (11:00AM class)
  - Section 14047  Wednesday, April 27, 2:45PM–4:45PM (12:30PM class)
  - Section 10934  Thursday, April 28, 2:45PM–4:45PM (2:00PM class)
Exam Dates

- Midterm #1: Thursday, February 11 (in-class)
- Midterm #2: Thursday, March 24 (in-class)
- Final Exam:
  - Section 10929  Tuesday, April 26, 8:00AM–10:00AM (9:30AM class)
  - Section 12249  Wednesday, April 27, 8:00AM–10:00AM (11:00AM class)
  - Section 14047  Wednesday, April 27, 2:45AM–4:45PM (12:30PM class)
  - Section 10934  Thursday, April 28, 2:45PM–4:45PM (2:00PM class)
Exam Dates

- Midterm #1: Thursday, February 11 (in-class)
- Midterm #2: Thursday, March 24 (in-class)
- Final Exam:
  - Section 10929  Tuesday, April 26, 8:00AM–10:00AM (9:30AM class)
  - Section 12249  Wednesday, April 27, 8:00AM–10:00AM (11:00AM class)
  - Section 14047  Wednesday, April 27, 2:45AM–4:45PM (12:30PM class)
  - Section 10934  Thursday, April 28, 2:45PM–4:45PM (2:00PM class)
Course Materials

- Course Pack.
- Calculator. Square root calculation, natural logarithm, exponentiation.
- iClicker.
Outline

1 Syllabus
   - Highlight of Syllabus

2 Knowledge and Data
   - Step-by-step Knowledge Building
   - Some fallacies in interpreting evidence
Step-by-step Knowledge Building

- Conceptualize the problem—broad wording
- Operationalize the problem—specific questions
- Design the study—how to select sample
- Collect the data—measurement instrument
- Analyze the data—comparing what
- Conclusions—repeatability and generalization
- Disseminate result—presentation of the results
Step-by-step Knowledge Building

- Conceptualize the problem—broad wording
- Operationalize the problem—specific questions
- Design the study—how to select sample
- Collect the data—measurement instrument
- Analyze the data—comparing what
- Conclusions—repeatability and generalization
- Disseminate result—presentation of the results
Step-by-step Knowledge Building

- Conceptualize the problem—broad wording
- Operationalize the problem—specific questions
- Design the study—how to select sample
- Collect the data—measurement instrument
- Analyze the data—comparing what
- Conclusions—repeatability and generalization
- Disseminate result—presentation of the results
Step-by-step Knowledge Building

- Conceptualize the problem—broad wording
- Operationalize the problem—specific questions
- Design the study—how to select sample
- Collect the data—measurement instrument
- Analyze the data—comparing what
- Conclusions—repeatability and generalization
- Disseminate result—presentation of the results
Step-by-step Knowledge Building

- Conceptualize the problem—broad wording
- Operationalize the problem—specific questions
- Design the study—how to select sample
- Collect the data—measurement instrument
- Analyze the data—comparing what
- Conclusions—repeatability and generalization
- Disseminate result—presentation of the results
Step-by-step Knowledge Building

- Conceptualize the problem—broad wording
- Operationalize the problem—specific questions
- Design the study—how to select sample
- Collect the data—measurement instrument
- Analyze the data—comparing what
  - Conclusions—repeatability and generalization
  - Disseminate result—presentation of the results
Step-by-step Knowledge Building

- Conceptualize the problem—broad wording
- Operationalize the problem—specific questions
- Design the study—how to select sample
- Collect the data—measurement instrument
- Analyze the data—comparing what
- Conclusions—repeatability and generalization
- Disseminate result—presentation of the results
Step-by-step Knowledge Building

- Conceptualize the problem—broad wording
- Operationalize the problem—specific questions
- Design the study—how to select sample
- Collect the data—measurement instrument
- Analyze the data—comparing what
- Conclusions—repeatability and generalization
- Disseminate result—presentation of the results
Examples of Wrong Reasoning Leading to Wrong Conclusions

- **Lack of evidence fallacy.** The fallacy lies in the reasoning that lack of evidence means the contrary is true.
- **Anecdotal evidence fallacy.** The fallacy lies in the reasoning that existence means prevalence.
- **Correlation equals causation fallacy.** The fallacy lies in the reasoning that “two things happening together” must mean one causes the other.
Examples of Wrong Reasoning Leading to Wrong Conclusions

- **Lack of evidence fallacy.** The fallacy lies in the reasoning that lack of evidence means the contrary is true.

- **Anecdotal evidence fallacy.** The fallacy lies in the reasoning that existence means prevalence.

- **Correlation equals causation fallacy.** The fallacy lies in the reasoning that “two things happening together” must mean one causes the other.
Examples of Wrong Reasoning Leading to Wrong Conclusions

- **Lack of evidence fallacy.** The fallacy lies in the reasoning that lack of evidence means the contrary is true.

- **Anecdotal evidence fallacy.** The fallacy lies in the reasoning that existence means prevalence.

- **Correlation equals causation fallacy.** The fallacy lies in the reasoning that “two things happening together” must mean one causes the other.
Examples of Wrong Reasoning Leading to Wrong Conclusions

- **Lack of evidence fallacy.** The fallacy lies in the reasoning that lack of evidence means the contrary is true.

- **Anecdotal evidence fallacy.** The fallacy lies in the reasoning that existence means prevalence.

- **Correlation equals causation fallacy.** The fallacy lies in the reasoning that “two things happening together” must mean one causes the other.