# Introductory biostatistics courses - What you need to know!

Many allied health science graduate majors require some biostatistics course or sequence, and most allow you to substitute a higher-numbered biostatistics course for a required course. Or perhaps biostatistics is not required, but you are interested in learning some!

The Biostatistics division in the School of Public Health (SPH) offers three one- or two-semester sequences for you to consider:

- **PubH 6414** Biostatistical Literacy OR
- **PubH 6450/6451** Biostatistics I and Biostatistics II OR
- **PubH 7401/7402** Fundamentals of Biostatistical Inference and Biostatistics Modeling and Methods

## Trying to understand which course is right for you?

The three options above cover, in large part, the same body of statistical ideas: basic distributions, descriptive statistics and graphing, hypothesis testing and confidence intervals for means and proportions, linear regression, analysis of variance, power and sample size, logistic regression, and Kaplan-Meier curves and time-to-event models.

The Biostatistical Literacy course (6414) has the primary goal of developing student ability to read and interpret statistical results in the primary literature of their specific scientific field of interest. This course involves minimal calculation and offers no formal training in any statistical programming software. The focus is on when to use a given method and how to interpret the results, not the actual computation or computer programming to obtain results from raw data.

The other two sequences (6450/6451 and 7401/7402) differ in the expected mathematical background, the level of underlying statistical fundamentals that students are expected to master, the depth to which statistical methods are covered, the use of statistical software, and credit hours.

Here are specifics on how the three options differ.

<table>
<thead>
<tr>
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<th>6414</th>
<th>6450/6451</th>
<th>7401/7402</th>
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<tbody>
<tr>
<td><strong>Credits</strong></td>
<td>3</td>
<td>4/4</td>
<td>4/4</td>
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<tr>
<td><strong>Offered</strong></td>
<td>Online &amp; in-class</td>
<td>Online &amp; in-class</td>
<td>In-class only</td>
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<tr>
<td><strong>Software</strong></td>
<td>none</td>
<td>R or SAS</td>
<td>SAS, R, or Stata</td>
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<td><strong>Computer lab time</strong></td>
<td>1 hour/week</td>
<td>1 hour/week (6450 only)</td>
<td>None</td>
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<tr>
<td><strong>Prerequisites</strong></td>
<td>College algebra</td>
<td>College algebra</td>
<td>Undergraduate calculus</td>
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<td><strong>Sufficient prerequisite for</strong></td>
<td>PubH 7415</td>
<td>PubH 6470, 7415, 7420, 7430, 7470</td>
<td>Any class with 6414/15 or 6450/51 as prerequisites</td>
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<td><strong>After completing the sequence</strong></td>
<td>- Understand appropriate use and interpretation of all statistical methods covered. - Be able to read and understand the</td>
<td>- Learn underlying algebraic basis for statistical fundamentals. - Understand methods and programming in depth.</td>
<td>- Understand the mathematical underpinnings of statistical reasoning and statistical methods. - Learn additional topics: multinomial</td>
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- Understand appropriate use and interpretation of all statistical methods covered.
- Be able to apply all methods learned to your own research.
- Models, advanced methods for repeated measures, time-to-event data.
- Understand appropriate use and interpretation of all statistical methods covered.
- Be able to apply all methods learned to your own research.

We also offer two courses on SAS programming: (1) PubH 6420, 1 credit, in-class and online, covering SAS programs for reading and processing data, and descriptive and basic statistical analysis; there are no pre-requisites. (2) PubH 6470, 3 credits, in-class only, introducing students (who have a minimum of 6450/6451) to SAS programming, graphics, and data analysis (including general linear models, logistic regression, longitudinal mixed effects models, and time-to-event models). For both courses, very little time is spent on explaining statistical methods; students are expected to have had exposure to them ahead of time.

You can find more information on each of our courses online in the University’s Course Catalog within MyU.

**How do you decide which to take?**

**SPH and other degree program admitted students:** It is important that you check with your Director of Graduate Studies, Program Director, Advising Team, or Academic Advisor to determine what is required vs. recommended, and what substitutions may be accepted. If you expect to do most or all of the statistical analyses for your MPH, MS, or other degree thesis/project, you will need two semesters of biostatistics (either 6450/6451 or 7401/7402) in order to be sufficiently prepared.

**SPH Core Concepts Certificate students:** Check with your Public Health Practice advisor to find out what the required biostatistics sequence is for your ultimate degree of interest, for example if you are interested in applying to a Master of Public Health Major/Program in the future. Even though the Certificate requires PubH 6414, you may want to take PubH 6450/6451.

**Non-degree seeking students potentially interested in an SPH degree program:** Feel free to check our website at www.sph.umn.edu, click on the major or program you are interested in, and review the curriculum to help determine which biostatistics courses to take.

**Whichever option you decide is appropriate for you, if it is a sequence we strongly encourage you to take both semesters, not just the first one!**

**You will be much better prepared to understand, interpret, use, and learn new statistics in your field of research over your career.**