

Comparison of the Introductory Biostatistics Courses

Historical differences:

Until the recent DBE curriculum revisions, BMTRY 700 and BMTRY 723 (formally 700-A) were considered to be the same course covering essentially the same topics, but presented to different target audiences. Both courses were considered "survey" courses that could be used as a stand-alone course for students needing a single (one semester) graduate level biostatistics methods course. However, the philosophy of the department was that DBE graduate students (who were required to take BMTRY 700) needed more derivation of formulas (more emphasis on "why"), more emphasis on "building block" topics such as basic probability and more "tie-in" with the companion statistics theory course than did non-majors (who took BMTRY 723 formally 700-A).

Changes with most recent DBE curriculum revision:

1. As a survey course, BMTRY 700 (and 723) had covered a very large number of topics; in the second semester of the methods sequence, some of the topics were revisited (e.g. ANOVA) and their level of coverage was expanded to provide suitable detail for students pursuing a Ph.D. with concentration in Biostatistics. With the curriculum revision, BMTRY 700 was changed from a survey course covering a large number of topics to be the first course of a new revised two semester methods sequence. Topics in BMTRY 700 and BMTRY 710 (Regression) were reorganized to make this required sequence follow a more logical flow of topics over the two semester period, i.e. to reduce the number of topics that were introduced in 700 and then revisited and expanded in the next course.
2. BMTRY 723 (formally 700-A) has been kept as part of the curriculum to accommodate the needs of non-DBE students who would benefit from a one semester survey of biostatistics course. Typically, these students have been graduate students (College of Graduate Studies), and residents/fellows/junior faculty in the College of Medicine (not enrolled in the DBE Clinical Masters program) whose career paths will lead them to be actively involved in the research process and the application/interpretation of statistical methods. BMTRY 723 covers more topics, but in less detail than BMTRY 700, recognizing that students taking only one course need exposure to some of the more advanced topics such as factorial experiments and multiple regression (which are covered in the second semester of the new BMTRY 700-710 methods sequence).
3. BMTRY 720 is designed as a course for students who require some exposure to statistical concepts but who will be primarily consumers rather than "practitioners" of research and statistical methods.

The specific differences in these two courses are described on the attached grid.

Appendix: Comparison of the Introductory Biostatistics Courses

	Basic Biostatistics	Applied Biostatistics	Introduction to Clinical (Biostatistics I)
Audience	Non-majors interested in reading literature	Non-majors in Basic Science Programs and others with interest in using/understanding some biostatistics	Biostatistic students in department of Biometry & Epidemiology including students in Master in Clinical Research Program or those desiring indepth knowledge of requirements of Biostatistics I and II to obtain full understanding
Credit	3 Credits including EXCEL Statistics Lab	4 Credits including Minitab Computer Lab ¹	5 Credits including SAS Language Lab
Text	Moore's <i>Basic Practice of Statistics, 2nd edition</i>	Daniel's <i>Biostatistics: A Foundation for Analysis in the Heath Sciences, 7th ed</i>	Rosner's <i>Fundamentals of Statistics, fifth edition</i>
Prerequisites	None	None	None
This course prerequisite to:	None	None	706, 704, 710
Topics:			
Numerical and graphical data description	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Joint, marginal, and conditional probability		<input type="checkbox"/>	<input type="checkbox"/>
Bayes' Rule		<input type="checkbox"/>	<input type="checkbox"/>
Binomial, Poisson Distribution		<input type="checkbox"/>	<input type="checkbox"/>
Normal Distribution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Confidence Intervals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample size and power considerations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hypothesis testing assumptions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
z - test		<input type="checkbox"/>	<input type="checkbox"/>
t-test, ANOVA, Chi-square, nonparameter tests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Error: Type I and Type II		<input type="checkbox"/>	<input type="checkbox"/>
α , β , p -value, power	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Simple linear regression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Correlation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiple linear regression		<input type="checkbox"/> (overview)	<input type="checkbox"/> (overview)
Aptness of regression model Regression diagnostics		<input type="checkbox"/> (overview)	
Completely Random Design	<input type="checkbox"/>	<input type="checkbox"/>	
Comparative, Matched Pair, and Block Experimental Designs	<input type="checkbox"/>	<input type="checkbox"/>	
Factorial experiment		<input type="checkbox"/>	
Repeated measures experiment		<input type="checkbox"/> (overview)	
Non-parametric procedures		<input type="checkbox"/>	
Survival Analysis		<input type="checkbox"/> (overview)	
Understanding the mathematical formulations and hand calculating statistics from formulas			<input type="checkbox"/>
Using mathematical formulation, mix of hand calculation and computer results for some formulas		<input type="checkbox"/>	
Evaluating research in academic journals: Descriptive/Correlational Designs, Intervention Studies, Predictive Models	<input type="checkbox"/>		<input type="checkbox"/>

¹Students may opt to use other packages such as BMDP, Statistica, SAS