

Yale School of Public Health
Master of Science in Biostatistics
Data Science Pathway
Curriculum (2022-2023 Matriculation)

The M.S. degree requires a total of 16 course units. The M.S in Biostatistics requires the student to complete or acquire an exemption from the following courses. Full time students must carry a minimum of 4 course units each semester. **Course substitutions (other than those listed) must be approved by the academic advisor, the Data Science Pathway Director and the DGS.**

Course	Title	Units	Term Offered	Suggested Term Taken	Notes
MS Required Courses (10 course units)					
BIS 525	Seminar in Biostatistics and Journal Club	0	Fall	1 st year	
BIS 526	Seminar in Biostatistics and Journal Club	0	Spring	1 st year	
BIS 620	Data Science Software Systems	1	Fall	1 st year	
BIS 623	Advanced Regression Models [or S&DS 612 Linear Models]	1	Fall	2 nd year	
BIS 628	Longitudinal and Multilevel Data Analysis	1	Spring		
BIS 630	Applied Survival Analysis [or BIS 643 Theory of Survival Analysis]	1	Spring		
BIS 678	Statistical Practice I – Capstone Experience	1	Fall	2 nd year	
BIS 687	Data Science Statistical Practice- Capstone Experience	1	Spring	2 nd year	
EPH 509	Fundamentals of Epidemiology	1	Fall	1 st year	
EPH 608	Frontiers of Public Health *	1	Fall	1 st year	
EPH 600	Research Ethics and Responsibilities	0	Fall	1 st year	
S&DS 541	Probability Theory [or S&DS 600 Advanced Probability or S&DS 551 Stochastic Process] – see note	1	Fall	1 st year	S&DS 600 (fall) S&DS 551 (spring)
S&DS 542	Theory of Statistics [or S&DS 610 Statistical Inference]	1	Spring	1 st year	S&DS 610 offered in Fall
BIS 695	Summer Internship in Biostatistical Research	0	Spring	1 st year	Spring Registration for Summer Completion
EPH 100/101	Professional Skills Series	0	Fall and Spring	1 st year	
A minimum of two of the following (REQUIRED) (2 Course units)					
BIS 555	Machine Learning and Biomedical Data	1	Fall		
BIS 557	Computational Statistics	1	Fall		Not offered 22-23
BIS 634	Computational Methods for Informatics	1	Fall		
BIS 646	Nonparametric Statistical Methods and their Applications	1	Spring		Can't be double counted under Machine Learning electives
BIS 550	Topics in Biomed Informatics and Data Science	1	Spring		
Suggested Electives in Machine Learning (1 course unit)					
Take one or more of the following (if not taken from list above)					
BIS 555	Machine Learning and Biomedical Data	1	Fall		
BIS 557	Computational Statistics	1	Fall		Not offered 22/23
BIS 634	Computational Methods for Informatics	1	Fall		
BIS 646	Nonparametric Statistical Methods and their Applications	1	Spring		Can't be double counted under BIS electives
S&DS 565	Introductory Machine Learning	1	Fall		
S&DS 631	Optimization and Computation	1	Fall		
S&DS 665	Intermediate Machine Learning	1	Fall		
CB&B 555	Unsupervised Learning for Big Data	1	Fall		
CB&B 567	Topics in Deep Learning: Methods & Biomedical Applications	1	Spring		

CB&B 663	Deep Learning Theory and Applications	1	Spring		
CB&B 745	Advanced Topics in Machine Learning	1	Spring		
Suggested Electives in Databases (1 course unit)					
<i>Take one or more of the following</i>					
BIS 638	Clinical Database Management Systems and Ontologies	1	Fall		
BIS 550	Topics in Biomed Informatics and Data Science	1	Spring		
CPSC 537	Introduction to Database Systems	1	Fall		
Electives (2 course units)					
<i>Take two additional course units from either the machine learning list, the databases list, or in BIS, CB&B or S&DS. Other courses from YSPH, CPSC, or another department may be acceptable if given permission from the Data Science Pathway Director.</i>					
Other Courses					
BIS 649/BIS 650	Master's Thesis Research Students choosing this option must present their research in a public seminar to graduate	2	Fall and Spring	2 nd year	Optional -if chosen student must still fulfill all other requirements listed above

Students should take 4 courses for credit each semester (BIS 525/526, EPH 600, EPH 100/101 are not for credit). Course schedules with more than 5 courses for credit will not be approved. Courses listed without a notation in the "term taken" column can be taken in either year of the program if prerequisites are met and with advisor approval.

*Students entering the program with an MPH or relevant graduate degree may be exempt from this requirement.

Updated: 7/7/22