STA-BA - Statistics

Overview

Institution Code
BAR01

Official Name of Program
Statistics

Plan Code
STA-BA

Department(s) Sponsoring Program
Information Systems and Statistics

Career
Undergraduate

Degree Designation
BA - Bachelor of Arts

Requirements

Simple Requisites

Degree Requirements - Bachelor of Arts
Type
Completion Requirement

Fulfill ALL of the following requirements:

Earn at least 120 credits

AND

Earn at least 30 credits
In Residence at Baruch College

AND

Earn at least 90 credits
Liberal Arts and Sciences Content Courses

AND

Earn a minimum GPA of 2.0

Additional Comments:

General Education Requirements - Required Core
Type
Completion Requirement

Fulfill ALL of the following requirements:

Required Core English Composition

Complete ALL of the following Courses:

- ENG 2100 - Writing I
  OR ENG 2100T - Writing I
  OR ENG 2100H - Honors Writing I
- ENG 2150 - Writing II
  OR ENG 2150T - Writing II

OR ENG 2150H - Honors - Writing II

A course in this area must meet all of the following learning outcomes. A student will:

- Read and listen critically and analytically, including identifying an argument's major assumptions and assertions and evaluating its supporting evidence.
- Write clearly and coherently in varied, academic formats (such as formal essays, research papers, and reports) using standard English and appropriate technology to critique and improve one's own and others' texts.
- Demonstrate research skills using appropriate technology, including gathering, evaluating, and synthesizing primary and secondary sources.
- Support a thesis with well-reasoned arguments, and communicate persuasively across a variety of contexts, purposes, audiences, and media.
- Formulate original ideas and relate them to the ideas of others by employing the conventions of ethical attribution and citation.

AND

Required Core Mathematical and Quantitative Reasoning

Complete at least 1 of the following courses:

- MTH 2140 - Mathematics and Quantitative Reasoning
- MTH 2160 - Ideas in Mathematics and Their Applications
- MTH 2003 - Precalculus and Elements of Calculus 1A
- MTH 2009 - Precalculus
  OR MTH 2009T - Precalculus
- MTH 2205 - Precalculus and Elements of Calculus 1B
- MTH 2207 - Elements of Calculus I and Matrix Algebra
- MTH 2610 - Calculus I
- MTH 2001 - Pre-Calculus
- PSY 2100 - Statistics for Social Science
- BIO 2100 - Biostatistics
  OR ENV 2100 - Biostatistics
- STA 2000 - Business Statistics I
- MTH 2001 - Pre-Calculus
- MTH 2600 - Calculus I with Trigonometry Refresher

A course in this area must meet all of the following learning outcomes. A student will:

- Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.
- Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.
- Represent quantitative problems expressed in natural language in a suitable mathematical format.
- Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.
- Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.
- Apply mathematical methods to problems in other fields of study.

The following courses are no longer offered at Baruch, but do appear on students' transfer evaluations. Any of these courses may be used to satisfy the Mathematical and Quantitative Reasoning requirement of the Pathways curriculum without appeal: MTH 2000; MTH 2300; MTH 2300; MTH 2301; MTH 2100; MTH 2150; MTH 2006; MTH 2206; and MTH 2630. MTH 3010 Calculus II is considered a STEM Variant course, and may also be used to satisfy this requirement without appeal.

** Zicklin students should not take MTH 2140 or MTH 2160, which do not meet the mathematics requirement for the BBA degree. Zicklin students must complete a course in precalculus (and must satisfy the prerequisites for whichever precalculus course they take). Therefore, these students usually take MTH 2003 or MTH 2009. Students who enter Baruch with a calculus placement (MTH 2207 or MTH 2610) may take STA 2000 to satisfy their Pathways requirement.

MTH 2140 and MTH 2160 are not appropriate for students within the Weissman School of Arts and Sciences whose major requires a statistics course or additional math courses (such majors include: Actuarial Science, Biological Sciences, Computer Science, Economics, Financial Mathematics, Natural Sciences ad hoc, and Statistics).

AND

Complete at least 1 courses in the following course sets:

- Required Core Life and Physical Sciences

A course in this area must meet all of the following learning outcomes. A student will:

- Identify and apply the fundamental concepts and methods of a life or physical science.

- Apply the scientific method to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, data analysis, and data presentation.
- Use the tools of a scientific discipline to carry out collaborative laboratory investigations.
- Gather, analyze, and interpret data and present it in an effective written laboratory or fieldwork report.
- Identify and apply research ethics and unbiased assessment in gathering and reporting scientific data.

NOTE: The following courses are no longer offered at Baruch, but do appear on students' transfer evaluations. Any of these courses may be used to satisfy the **Life and Physical Sciences** or the **Scientific World** requirement of the Pathways curriculum without appeal: BIO 1003; BIO 1005; CHM 1000; ENV 1020; ENV 1021; and PHY 1003. One course may not be used to satisfy both requirements.

STEM VARIANT COURSES

The following courses may be used to satisfy either the *Life and Physical Sciences* or the *Scientific World* requirement (one course may not satisfy both requirements). Students who wish to pursue a major or minor in the Natural Sciences should satisfy the Pathways science requirements with STEM Variant courses.

BIO 2010	Principles of Biology I
CHM 2003	General Chemistry I
PHY 2003	General Physics I
PHY 3010	Quantitative Physics I

Additional Comments:
The Department of Natural Sciences offers "stand-alone" sections of their Pathways courses (BIO 1011L, BIO 1012, etc.), specifically designed for students who are only required to complete one half of the paired courses – lecture or lab, not both. For example, a student who transfers a ***Scientific World*** course, may satisfy the ***Life and Physical Sciences*** requirement with a stand-alone section of a Natural Sciences course in that category. These stand-alone sections are *not* open to students who enter Baruch as freshmen or to transfer students who have satisfied neither the ***Life & Physical Sciences*** nor the ***Scientific World*** requirement at the time they entered Baruch. Please consult the Department of Natural Sciences to request registration permission for any of their stand-alone sections (17 Lexington Ave, room 506; 646-660-6200)

General Education Requirements - Flexible Core
Type
Completion Requirement

Fulfill ALL of the following requirements:

Complete at least 1 courses in the following course sets:
- Flexible Core World Cultures and Global Issues

A course in this area must meet *at least three* of the following *additional* learning outcomes. A student will:

- Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring world cultures or global issues, including, but not limited to, anthropology, communications, cultural studies, economics, ethnic studies, foreign languages (building upon previous language acquisition), geography, history, political science, sociology, and world literature.
- Analyze culture, globalization, or global cultural diversity, and describe an event or process from more than one point of view.
- Analyze the historical development of one or more non-U.S. societies.
- Analyze the significance of one or more major movements that have shaped the world's societies.
- Analyze and discuss the role that race, ethnicity, class, gender, language, sexual orientation, belief, or other forms of social differentiation play in world cultures or societies.
- Speak, read, and write a language other than English, and use that language to respond to cultures other than one's own.

AND

Complete at least 1 courses in the following course sets:
- Flexible Core U.S. Experience in Its Diversity

A course in this area must meet *at least three* of the following *additional* learning outcomes. A student will:

- Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the U.S. experience in its diversity, including, but not limited to, anthropology, communications, cultural studies, economics, history, political science, psychology, public affairs, sociology, and U.S. literature.
- Analyze and explain one or more major themes of U.S. history from more than one informed perspective.
- Evaluate how indigenous populations, slavery, or immigration have shaped the development of the United States.
- Explain and evaluate the role of the United States in international relations.

- Identify and differentiate among the legislative, judicial, and executive branches of government and analyze their influence on the development of U.S. democracy.
- Analyze and discuss common institutions or patterns of life in contemporary U.S. society and how they influence, or are influenced by, race, ethnicity, class, gender, sexual orientation, belief, or other forms of social differentiation.

***Note: HIS 1004 History of American Civilization I** is no longer offered at Baruch, but it does appear on students' transfer evaluations. This course may be used to satisfy the U.S. Experience in its Diversity requirement of the Pathways curriculum without appeal.*

AND

Complete at least 1 courses in the following course sets:

- Flexible Core Creative Expression

A course in this area must meet *at least three* of the following *additional* learning outcomes. A student will:

- Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring creative expression, including, but not limited to, arts, communications, creative writing, media arts, music, and theater.
- Analyze how arts from diverse cultures of the past serve as a foundation for those of the present, and describe the significance of works of art in the societies that created them.
- Articulate how meaning is created in the arts or communications and how experience is interpreted and conveyed.
- Demonstrate knowledge of the skills involved in the creative process.
- Use appropriate technologies to conduct research and to communicate.

AND

Complete at least 1 courses in the following course sets:

- Flexible Core Individual and Society

A course in this area must meet *at least three* of the following *additional* learning outcomes. A student will:

- Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the relationship between the individual and society, including, but not limited to, anthropology, communications, cultural studies, history, journalism, philosophy, political science, psychology, public affairs, religion, and sociology.
- Examine how an individual's place in society affects experiences, values, or choices.
- Articulate and assess ethical views and their underlying premises.
- Articulate ethical uses of data and other information resources to respond to problems and questions.
- Identify and engage with local, national, or global trends or ideologies, and analyze their impact on individual or collective decision-making.

AND

Complete at least 1 courses in the following course sets:

- Flexible Core Scientific World

A course in this area must meet at least three of the following *additional* learning outcomes. A student will:

- Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the scientific world, including, but not limited to: computer science, history of science, life and physical sciences, linguistics, logic, mathematics, psychology, statistics, and technology-related studies.
- Demonstrate how tools of science, mathematics, technology, or formal analysis can be used to analyze problems and develop solutions.
- Articulate and evaluate the empirical evidence supporting a scientific or formal theory.
- Articulate and evaluate the impact of technologies and scientific discoveries on the contemporary world, such as issues of personal privacy, security, or ethical responsibilities.
- Understand the scientific principles underlying matters of policy or public concern in which science plays a role.

Note: The following courses are no longer offered at Baruch, but do appear on students' transfer evaluations. Any of these courses may be used to satisfy the *Scientific World* or the *Life and Physical Sciences* requirement of the Pathways curriculum without appeal: BIO 1003; BIO 1005; CHM 1000; ENV 1020; ENV 1021; and PHY 1003. One course may not be used to satisfy both requirements.

STEM VARIANT COURSES

The following courses may be used to satisfy either the **Life and Physical Sciences** or the **Scientific World** requirement (one course may not satisfy both requirements). Students who wish to pursue a major or minor in the Natural Sciences should satisfy the Pathways science requirements with STEM Variant courses.

0903051 - Missing course Principles of Biology I

0905521 - Missing course General Chemistry I

0937161 - Missing course General Physics I

0937241 - Missing course Quantitative Physics I

AND

Complete at least 1 courses in the following course sets:

- Flexible Core - Any Area

Additional Comments:

The Flexible Core is made up of six courses, which must be taken in five different categories (numbered 4-8): ***4) World Cultures and Global Issues; 5) U.S. Experience in its Diversity; 6) Creative Expression; 7) The Individual and Society;*** and ***8) Scientific World***.

In fulfilling the six-course requirement, students may not take more than two courses from any one department, discipline, or interdisciplinary field.

Please note that some departments offer courses in more than one category…

- ANT and SOC courses are offered by the Department of Sociology and Anthropology;
- ART, MSC, and THE courses are offered by the Department of Fine and Performing Arts;
- BLS and LTS *(formerly HSP)* courses are offered by the Department of Black and Latino Studies;
- BIO, ENV, CHM, and PHY courses are offered by the Department of Natural Science; and
- Within the Pathways Flexible Core, POL and PAF (formerly PUB) are considered to be a single field.

***All Flexible Core courses must meet the following three learning outcomes*. A student will:**

- Gather, interpret, and assess information from a variety of sources and points of view.
- Evaluate evidence and arguments critically or analytically.
- Produce well-reasoned written or oral arguments using evidence to support conclusions.

The learning goals or outcomes of each area within the Flexible Core are included above, followed by lists of applicable courses.

General Education Requirements - College Option

Type

Completion Requirement

Fulfill ALL of the following requirements:

Complete at least 1 of the following courses:

- CMP 2800 - Great Works of Literature I
  OR ENG 2800 - Great Works of Literature I
- CMP 2850 - Great Works of Literature II
  OR ENG 2850 - Great Works of Literature II

AND

Earn at least 3 credits

4000-level CIC "capstone" course for one of the liberal arts minors

This course must be completed at Baruch.

AND

Earn at least 6 credits

Two 3000-level liberal arts courses towards the same liberal arts minor.

- *The liberal arts minor cannot be within the same area of study as the major. This is also true for students who are required to complete part of the minor for the College Option.*
- *There is no GPA stipulation attached to the College Option courses, but in order to graduate with the liberal arts minor, a student must have a grade point average of at least 2.00 in the three courses that make up his or her liberal arts minor.*

Additional Comments:

The College Option consists of as many as four courses (6, 9, or 12 credits), depending on how much coursework the student has completed at another institution.

Major Requirements - Pre-Weissman Core
Type
Completion Requirement

Fulfill ALL of the following requirements:

Complete ALL of the following Courses:
- COM 1010 - Speech Communication
  OR COM 1010H - Honors Speech Communications

AND

Foreign Language

Earn at least 6 credits
Students may not use proficiency and/or exemption exams to satisfy this requirement.

1st Foreign Language course (based on placement) and 2nd Foreign Language course (the same language as the 1st Foreign Language course)

Students who transfer language credits for languages not taught at Baruch College may use these credits for the foreign language requirement at Baruch College.

Placement Information:
Students should review the guidelines below, and see a faculty advisor in the Department of Modern Languages and Comparative Literature to confirm proper placement if they intend to continue a language to which they have prior exposure. Students have the option of taking a placement exam to ensure that they are placed at the correct level.

Please consult the **Department of Modern Languages and Comparative Literature** for assistance

Additional Comments:

Major Requirements - Overall
Type
Completion Requirement

Fulfill ALL of the following requirements:

Earn at least 34 credits
A minimum of 60% of the credits in the major field must be completed at Baruch College. For this major a minimum of 19 credits must be taken at Baruch.

Total Credit Range including Prerequisites is between 37 - 39.

AND

Earn a minimum GPA of 2.0

Additional Comments:
Non-liberal arts courses that apply to this major will not count towards the 90 liberal arts credit minimum required for a Bachelor of Arts degree. Students who have completed MTH3120 Elementary Probability cannot enroll in MTH4120 Introduction to Probability. They must satisfy the probability requirement by completing MTH4119 Multivariate Prob Dist- please consult the Department of Mathematics.

Major Requirements - Program Prerequisites
Type
Prerequisite

Complete ALL of the following Courses:
- STA 2000 - Business Statistics I
- MTH 3020 - Calculus III

OR MTH 3030 - Elements of Calculus III
OR MTH 3050 - Calculus III and Vector Calculus

Additional Comments:

Major Requirements - Required Courses
Type
Completion Requirement

Fulfill ALL of the following requirements:

Complete ALL of the following Courses:

- MTH 4100 - Linear Algebra and Matrix Methods
- MTH 4120 - Introduction to Probability
- MTH 4430 - Mathematics of Inferential Statistics
- STA 3000 - Statistical Computing
- STA 3920 - Data Mining for Business Analytics
- STA 4155 - Regression and Forecasting Models for Business Applications
  OR MTH 4130 - Mathematics of Data Analysis

- Students can receive credit for only STA4155 Regression and Forecasting Mod **OR** MTH4130 Mathematics of Data Analysis.
- Students who have completed MTH3120 Elementary Probability cannot enroll in MTH4120 Introduction to Probability. They must satisfy the probability requirement by completing MTH4119 Multivariate Prob Dist (please consult the Department of Mathematics).

AND

Complete at least 1 of the following courses:

- STA 4920 - Advanced Data Mining
- STA 4158 - Analysis of Time Series
- STA 4000 - Introduction to SAS Programming
- OPR 3450 - Quantitative Decision Making for Business I

- These courses may also be used as electives for the major.

Additional Comments:

Major Requirements - Elective Courses
Type
Completion Requirement

Complete at least 1 of the following courses:

- MTH 4000 - Bridge to Higher Mathematics
- MTH 4010 - Mathematical Analysis I
- MTH 4020 - Advanced Calculus II
- MTH 4030 - Topology
- MTH 4110 - Ordinary Differential Equations
- MTH 4115 - Numerical Methods for Differential Equations in Finance
- MTH 4125 - Introduction to Stochastic Processes
- MTH 4135 - Computational Methods in Probability
- MTH 4140 - Graph Theory
- MTH 4145 - Mathematical Modeling
- MTH 4150 - Combinatorics
- MTH 4200 - Theory of Numbers
- MTH 4210 - Elements of Modern Algebra
- MTH 4220 - Introduction to Modern Geometry
- MTH 4230 - History of Mathematics
- MTH 4240 - Differential Geometry
- MTH 4300 - Algorithms, Computers and Programming II
- MTH 4310 - Methods of Numerical Analysis

- MTH 4315 - Introduction to Mathematical Logic
- MTH 4320 - Data Structures and Algorithms
- MTH 4410 - Theory of Interest
- MTH 4420 - Actuarial Mathematics I
- MTH 4421 - Actuarial Mathematics II
- MTH 4451 - Short-Term Insurance Mathematics
- MTH 4500 - Introductory Financial Mathematics
- MTH 4600 - Data Analysis and Simulation for Financial Engineers
- MTH 5010 - Advance Calculus III
- MTH 5020 - Theory of Functions of a Complex Variable
- MTH 5030 - Theory of Functional of Real Variables
- MTH 5100 - Partial Differential Equations and Boundary Value Problems
- MTH 5500 - Stochastic Calculus for Finance
- CIS 2300 - Programming and Computational Thinking
- CIS 3100 - Object-Oriented Programming I
- CIS 3120 - Programming for Analytics
- CIS 3400 - Database Management Systems
- CIS 4100 - Data Structures and Algorithms
- CIS 4400 - Data Warehousing for Analytics
- OPR 3450 - Quantitative Decision Making for Business I
- OPR 3451 - Quantitative Decision Making for Business II
- OPR 3453 - Bayesian Statistical Inference and Decision Making
- OPR 4470 - Special Topics in Operations Research
- OPR 5000 - Independent Study and Research in Operations Research I
- STA 4000 - Introduction to SAS Programming
- STA 4157 - Experimental Design for Machine Learning
- STA 4158 - Analysis of Time Series
- STA 4170 - Data Visualization
- STA 4370 - Special Topics in Applied Statistics
- STA 4920 - Advanced Data Mining
- STA 5000 - Independent Study and Research in Statistics I

Earn at least 3 credits from the following:

- Liberal Arts Electives
- You may need to take additional Liberal Arts Courses to complete the required credits for your degree.

Additional Comments:

Equivalent courses in the arts and sciences and business curricula:

The following pairs of courses are considered as equivalent for purposes of credits. Students can be given credit for either course but not for both:
STA2000 Business Statistics I and STA2100 Statistics for Social Science (STA2000 Business Statistics I may be used for either the BA or BBA)
STA3154 Business Statistics II and STA 3556
STA4155 Regression and Forecasting Mod and STA 4554
STA4157 Anal Var:Princ&Applc and STA 4557
OPR3453 Bayesian Inference/Decision and OPR 4653