

Timetable - PhD

	Summer/Pre-Term	Fall	Winter	Spring	Summer
1 st Year	<ul style="list-style-type: none"> •QBS 110: Integrative Biomedical Sciences Seminar (0.5) •QBS 103: Foundations of Data Science (Bootcamp)(0.5) •QBS 700: Mandatory Ethics 	<ul style="list-style-type: none"> •QBS 119: Applied Biostats or QBS 120: Biostatistics I (both xlist PH 271) •QBS 130: Epidemiology I •QBS 270: Epi. Journal Club •QBS 197: Research Rotation 	<ul style="list-style-type: none"> •QBS 121: Biostatistics II: Regression •QBS 131: Epidemiology II •QBS 270: Biostatistics Journal Club •QBS 197: Research Rotation 	<ul style="list-style-type: none"> •QBS 146: Bioinformatics I •QBS 197: Research Rotation •QBS 270: Bioinformatics Journal Club <p><u>Core Requirement Options:</u></p> <ul style="list-style-type: none"> •QBS 108: Machine Learning •QBS 139: Advanced Method in Health Services Research •QBS 140: Decision & Cost Eff. Analysis 	<ul style="list-style-type: none"> •QBS 199: 4th Research Rotation if needed •Begin Organizing Qualifier Exam *QBS 196: Supervised Teaching
2 nd year	<ul style="list-style-type: none"> *QBS 196: Supervised Teaching 	<ul style="list-style-type: none"> •QBS 197-198: Research *QBS 196: Supervised Teaching •Begin Work on Qualifier Exam •Elective Options • Journal Club of Choice (193, 194, 270 or other) 	<ul style="list-style-type: none"> •QBS 197: Research •Journal Club of Choice *QBS 196: Supervised Teaching •Continue Work on Qualifier Exam •Elective Options Journal Club of Choice (193, 270 or other) 	<ul style="list-style-type: none"> •QBS 197-198: Research •Journal Club of Choice *QBS 196: Supervised Teaching •Continue Work/defend Qualifier Exam •Elective Options Journal Club of Choice (193, 270, 271 or other) 	<ul style="list-style-type: none"> •QBS 199 or 299: Research •Continue Work/defend Qualifier Exam •Elective Options *QBS 196: Supervised Teaching
3 rd Year	<ul style="list-style-type: none"> *QBS 196: Supervised Teaching 	<ul style="list-style-type: none"> •QBS 297-299: Research •Journal Club of Choice •Journal Club of Choice (193, 194, 270 or other) 	<ul style="list-style-type: none"> •QBS 297-299: Research • Journal Club of Choice (193, 270 or other) 	<ul style="list-style-type: none"> •QBS 297-299: Research • Journal Club of Choice (193, 270, 271 or other) 	<ul style="list-style-type: none"> •QBS 297-299: Research • Journal Club of Choice (193 or other)



PhD: QBS Electives 21-22

Fall	Winter	Spring
QBS 101: Foundations of Programming for Data Scientists	QBS 101: Foundations of Programming for Data Scientists	QBS 101: Foundations of Programming for Data Scientists
QBS 110.5: Integrative Biomedical Sciences Project (.5un)	QBS 123: Biostats Consulting	QBS 108: Machine Learning
QBS 123: Biostats Consulting	QBS 125: Biomedical Informatics	QBS 122: Biostats III: Modeling Complex Data
QBS 124: Advanced Biomedical Data Analysis	QBS 137: Applied Epidemiology II	QBS 123: Biostats Consulting
QBS 126: Analysis of Densely-Collected Longitudinal Data	QBS 177: Methods of Statistical Learning for Big Data	QBS 124: Advanced Biomedical Data Analysis
QBS 132: Molecular Biologic Markers in Human Health Studies	QBS 180: Data Visualization (0.5un)	QBS 133: Clinical Epidemiology
QBS 132.5: Molec. Biol. Markers Lab (.5un)	QBS 192: Health Informatics	QBS 134: Topics in Epidemiology
QBS 136: Applied Epidemiology (.5un)	QBS 195: Independent Study	QBS 139/PH 147:Advanced Methods in Health Services Research
QBS 181: Data Wrangling		QBS 140/PH 121:Decision & Cost Effectiveness Analysis
QBS 195: Independent Study		QBS 195: Independent Study



Timetable – Health Data Science (18 Units)

Fall: 1 st Yr	Winter	Spring	Summer	Fall: 2 nd Yr
Pre-Term (.5 Unit) Aug 16-Sept 10	3-4 Units	3 Units	3 Units	3-4 Units
QBS 103: Foundations of Data Science (0.5)	*QBS 101: Foundations of Programming for Data Scientists (0.5)	*QBS 101: Foundations of Programming for Data Scientists (0.5)	QBS 185: Health Data Science Capstone (3 Units)	Any Electives *QBS 124: Advanced Biomedical Data Analysis (tentative)
QBS 700: Mandatory Ethics Course (non-credit)	QBS 121: Biostats II	QBS 108: Machine Learning		
Fall Quarter (3.5 - 4 Units)	QBS 177: Methods of Statistical Learning for Big Data	*Choose 1 of: QBS 122: Biostats III, QBS 146: Bioinformatics I, or QBS 124: Advanced Biomedical Data Analysis		
*QBS 101: Foundations of Programming for Data Scientists (0.5)	QBS 180: Data Visualization (0.5)	QBS 185.5 Capstone Prep (0.5)		
*QBS 119: Applied Biostats or QBS 120: Biostats I	QBS 185.5: Capstone Prep (0.5)	*May choose 1 unit elective credit		
QBS 130: Epidemiology I	QBS 270: Biostatistics Journal Club (0.5) (or QBS 194: Biostatistics Journal Club .5 unit – Fall)	*May choose 0.5 unit elective credit if testing out of QBS 101		
QBS 194: Biostatistics Journal Club (0.5) (or QBS 270: Biostatistics Journal Club .5 unit – Winter)	*May choose additional 0.5 unit elective credit if taking QBS 270 in Winter *May choose additional 0.5 unit elective credit if testing out of QBS 101			
QBS 181: Data Wrangling				
*May choose additional 0.5 unit elective credit if taking QBS 270 in Winter *May choose additional 0.5 unit elective credit if testing out of QBS 101				

Students who matriculated Fall 2021 and beyond may not take more than 4 units of course work per quarter unless approved by QBS administration and leadership.

For the Fall Quarter, this unit limit does not include pre-term mandatory courses QBS 103: Foundations of Data Science, QBS 700: Responsible and Ethical Conduct of Research, or QBS 110: Integrative Biomedical Sciences Seminar.

Health Data Science Fall Electives 2021

Tier 1 Electives

QBS 124: Advanced Biomedical Data Analysis
 QBS 126 : Analysis of Densely-Collected Longitudinal Data
 QBS 136: Applied Epi. Methods I (.5un)
 COSC 274: Machine Learning and Statistical Data Analysis

Encouraged Electives

QBS 110: Integrative Biomedical Sciences seminar
 QBS 110.5: Integrative Biomedical Sciences Project (.5un)
 QBS 123: Biostats Consulting
 QBS 119: Applied Biostatistics
 QBS 120: Biostatistics I
 QBS 123: Biostats Consulting
 QBS 131: Epidemiology II
 QBS 132: Molecular Biologic Markers in Human Health Studies
 QBS 132.5: Molec. Biol. Markers Lab (.5un)
 QBS 147/BIOL 147: Genomics from Data to Analysis
 QBS 193: Independent JC (0.5)
 QBS 194: Biostatistics JC
 QBS 195: Independent Study
 COSC 169: Applications of Data Science (Now Mobile X)
 COSC 189: Topics in Applied Computer Science
 COSC 276: Artificial Intelligence
 PH 125: Introduction to Qualitative Methods for Public Health & Healthcare Studies

Additional Approved Electives

QBS 270: QBS Journal Club: Epidemiology
 COSC 122: 3D Digital Modeling
 COSC 124: Computer Animation:
 COSC 281: Principles of Robot Design and Programming
 ENMG 181: Marketing
 ENMG 188: Law for Technology and Entrepreneurship
 ENMG 190: Platform Design, Management, and Strategy

*The Tuck Schedule of courses for 21-22 will be sent via email



Health Data Science Winter Electives 2022

Tier 1 Electives

QBS 125: Biomedical Informatics
QBS 131: Foundations of Epidemiology II
QBS 137: Applied Epi. Methods II (0.5)
QBS 192: Health Informatics
COSC 274: Machine Learning and Statistical Data Analysis

Encouraged Electives

QBS 123: Biostats Consulting
QBS 193: Independent JC (0.5)
QBS 195: Independent Study
QBS 270: QBS Journal Club: Biostatistics (0.5)

Additional Approved Electives

COSC 267: Introduction to Human-Computer Interaction
PH 115: Leading Change in Value-Based Public Health and Healthcare
PH 131: Health Communications
PH 151: Environmental Health Science and Policy
ENMG 183: Operations Management
ENMG 184: Introduction to Optimization Methods
ENMG 190: Platform Design, Management, and Strategy
MATH 106 Topics in Probability

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Health Data Science Spring Electives 2022

Tier 1 Electives

QBS 122: Biostatistics III: Modeling Complex Data
 QBS 146: Foundations of Bioinformatics
 COSC 274: Machine Learning and Statistical Data Analysis

Encouraged Electives

QBS 123: Biostats Consulting
 QBS 133: Clinical Epidemiology
 QBS 134: Topics in Epidemiology
 QBS 139: Advanced Methods in Health Services Research
 QBS193: Independent JC (0.5)
 QBS 195: Independent Study
 *MICRO 154: (FAIR Bioinformatics/Omics Data)(0.5) SUMMER

Additional Approved Electives

QBS 140: Decision & Cost-Effective Analysis
 QBS 270: QBS Journal Club: Bioinformatics
 QBS 271: Advanced Epi JC (0.5) (Spring) – not offered every year
 PH 151: Environmental Health Science and Policy
 ENMG 182: Data Analytiics
 MATH 100: Data-driven Uncertainty Quantification
 PEMM 132: Clinical Management of Cancer

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Timetable – Epidemiology (18 Units)

Fall: 1 st Yr	Winter	Spring	Summer	Fall: 2 nd Yr
Pre-Term (.5 Unit) Aug 16-Sept 10	3.5 Units	3 Units	3 Units	3-4 Units
*QBS 103: Foundations of Data Science (0.5) QBS 700: Mandatory Ethics Course (non-credit)	*QBS 101: Foundations of Programming for Data Scientists (0.5) QBS 121: Biostats II	*QBS 101: Foundations of Programming for Data Scientists (0.5) QBS 133: Clinical Epidemiology and/or QBS 134: Topics in Epidemiology (core requirement to take 2 out of 3 of: 132, 133, 134)	QBS 185: Health Data Science Capstone (3 Units)	Any Elective *QBS 132: Molecular Biologic Markers in Human Health Studies (core requirement to take 2 out of 3 of: 132, 133, 134)
Fall Quarter (3-4 Units)	QBS 131: Epidemiology II	QBS 146: Bioinformatics I		
*QBS 101: Foundations of Programming for Data Scientists (0.5)	QBS 137: Applied Epi.I Methods II (0.5)	QBS 185.5 Capstone Prep (0.5)		
*QBS 119: Applied Biostats or QBS 120: Biostats I	QBS 185.5: Capstone Prep (0.5)	May choose 1 unit elective credit if not taking both QBS 133 & QBS 134 *May choose additional 0.5 unit elective credit if testing out of QBS 101		
QBS 130: Epidemiology I	*May choose 0.5 unit elective credit *May choose additional 0.5 unit elective credit if testing out of QBS 101			
*QBS 132: Molecular Biologic Markers in Human Health Studies (core requirement to take 2 out of 3 of: 132, 133, 134)				
QBS 136: Applied Epi.I Methods I (0.5)				
*May choose 1 unit elective credit if not taking QBS 132 *May choose additional 0.5 unit elective credit if testing out of QBS 101				

Students who matriculated Fall 2021 and beyond may not take more than 4 units of course work per quarter unless approved by QBS administration and leadership.

For the Fall Quarter, this unit limit does not include pre-term mandatory courses QBS 103: Foundations of Data Science, QBS 700: Responsible and Ethical Conduct of Research, or QBS 110: Integrative Biomedical Sciences Seminar.

Epidemiology Fall Electives 2021

Tier 1 Electives
QBS 110: Integrative Biomedical Sciences seminar
QBS 110.5: Integrative Biomedical Sciences Project (.5un)
QBS 132: Molecular Biologic Markers in Human Health Studies
QBS 132.5: Molec. Biol. Markers Lab (.5un)
QBS 147/BIOL 147: Genomics from Data to Analysis
QBS 195: Independent Study
QBS 270: QBS Journal Club: Epidemiology
QBS 124: Advanced Biomedical Data Analysis
QBS 126 : Analysis of Densely-Collected Longitudinal Data

Tier 2 Electives
QBS 123: Biostats Consulting
QBS 124: Advanced Biomedical Data Analysis
QBS 126: Analysis of Densely-Collected Longitudinal Data
QBS 123: Biostats Consulting
QBS 181: Data Wrangling
QBS 193: Independent JC (0.5)
QBS 194: Biostatistics JC (or QBS 270-Winter)
QBS 195: Independent Study
PH 111: Medical Care Epidemiology: Principles, Applications and Insights
PH 117: Introduction to Quality Improvement in Health Systems
PH 125: Introduction to Qualitative Methods for Public Health & Healthcare Studies
COSC 274: Machine Learning and Statistical Data Analysis

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Epidemiology Winter Electives 2022

Tier 1 Electives

QBS 177: Methods of Statistical Learning for Big Data

QBS 180: Data Visualization

QBS 195: Independent Study

Tier 2 Electives

QBS 123: Biostats Consulting

QBS 192: Health Informatics

QBS 193: Independent JC (0.5)

QBS 270: QBS Journal Club: Biostatistics (0.5) (or QBS 194-Winter)

PH 115: Leading Change in Value-Based Public Health and Healthcare

PH 126: Statistical Measurement & Analysis for Healthcare Quality Improvement

PH 131: Health Communications

PH 151: Environmental Health Science and Policy

COSC 274: Machine Learning and Statistical Data Analysis

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Epidemiology Spring Electives 2022

Tier 1 Electives

QBS 122: Biostatistics III: Modeling Complex Data
QBS 133: Clinical Epidemiology
QBS 134: Topics in Epidemiology
QBS 195: Independent Study
QBS 271: Advanced Epi JC (0.5) (Spring) – not offered every year

Tier 2 Electives

QBS 108: Machine Learning
QBS 123: Biostats Consulting
COSC 274: Machine Learning and Statistical Data Analysis
PEMM 126: Cancer Biology
PEMM 132: Clinical Management of Cancer
*PH 154: Determinants of Health Inequities (SUMMER)

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Timetable – Medical Informatics (18 Units)

Fall: 1 st Yr	Winter	Spring	Summer	Fall: 2 nd Yr	
Pre-Term (.5 Unit) Aug 16-Sept 10	3.5 Units	3 Units	3 Units	4 Units	
*QBS 103: Foundations of Data Science (0.5)	*QBS 101: Foundations of Programming for Data Scientists (0.5)	*QBS 101: Foundations of Programming for Data Scientists (0.5)	QBS 185: Health Data Science Capstone(3 Units)	Any Elective	
QBS 700: Mandatory Ethics Course (non-credit)	QBS 121: Biostats II	QBS 139/PH 147:Advanced Methods in Health Services Research			
Fall Quarter(3.5 Units)	QBS 180: Data Visualization (0.5)	QBS 140/PH 121:Decision & Cost Effectiveness Analysis			
*QBS 101: Foundations of Programming for Data Scientists (0.5)	QBS 192: Health Informatics	QBS 185.5 Capstone Prep (0.5)			
*QBS 119: Applied Biostats or QBS 120: Biostats I	QBS 185.5: Capstone Prep (0.5)	*May choose 1 unit elective credit *May choose an additional 0.5 unit elective credit if testing out of QBS 101			
QBS 130: Epidemiology I	*May choose 0.5 unit elective credit *May choose an additional 0.5 unit elective credit if testing out of QBS 101				
QBS181: Data Wrangling					
*May choose 0.5 unit elective credit *May choose an additional 0.5 unit elective credit if testing out of QBS 101					

Students who matriculated Fall 2021 and beyond may not take more than 4 units of course work per quarter unless approved by QBS administration and leadership.

For the Fall Quarter, this unit limit does not include pre-term mandatory courses QBS 103: Foundations of Data Science, QBS 700: Responsible and Ethical Conduct of Research, or QBS 110: Integrative Biomedical Sciences Seminar.

Medical Informatics Fall Electives 2021

Tier 1 Electives

QBS 119: Applied Biostatistics OR QBS 120: Biostatistics I
QBS 124: Advanced Biomedical Data Analysis
QBS 126 : Analysis of Densely-Collected Longitudinal Data
PH 111: Medical Care Epidemiology: Principles, Applications and Insights
PH 112: Medical Care and the Corporation

Tier 2 Electives

QBS 110: Integrative Biomedical Sciences seminar
QBS 110.5: Integrative Biomedical Sciences Project (.5un)
QBS 123: Biostats Consulting
QBS 132: Molecular Biologic Markers in Human Health Studies
QBS 132.5: Molec. Biol. Markers Lab (.5un)
QBS 136: Applied Epi. Methods I (.5un)
QBS 147/BIOL 147: Genomics from Data to Analysis
QBS 193: Independent JC (0.5)
QBS 194: Biostatistics JC
QBS 195: Independent Study
QBS 270: QBS Journal Club: Epidemiology
PH 117: Introduction to Quality Improvement in Health Systems
PH 125: Introduction to Qualitative Methods for Public Health & Healthcare Studies
COSC 274: Machine Learning and Statistical Data Analysis
COSC 169: Applications of Data Science (Now Mobile X)
COSC 274: Machine Learning and Statistical Data Analysis

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Medical Informatics Winter Electives 2022

Tier 1 Electives

QBS 125: Biomedical Informatics

QBS 131: Foundations of Epidemiology II

QBS 192: Health Informatics

PH 115: Leading Change in Value-Based Public Health and Healthcare

PH 126: Statistical Measurement & Analysis for Healthcare Quality Improvement

PH 151: Environmental Health Science and Policy

The remainder of elective units are to be chosen from the following (Tier 2)

QBS 123: Biostats Consulting

QBS 137: Applied Epi. Methods II (0.5)

QBS193: Independent JC (0.5)

QBS 195: Independent Study

QBS 270: QBS Journal Club: Biostatistics (0.5)

PH 131: Health Communications

COSC 274: Machine Learning and Statistical Data Analysis

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Medical Informatics Spring Electives 2022

Encouraged Electives

QBS 108: Machine Learning

QBS 122: Biostatistics III: Modeling Complex Data

The remainder of elective units are to be chosen from the following (Tier 2)

QBS 123: Biostats Consulting

QBS 133: Clinical Epidemiology

QBS 134: Topics in Epidemiology

QBS 139: Advanced Methods in Health Services Research

QBS193: Independent JC (0.5)

QBS 195: Independent Study

QBS 270: QBS Journal Club: Bioinformatics

QBS 271: Advanced Epi JC (0.5) (Spring) – not offered every year

PEMM 132: Clinical Management of Cancer

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