

# NLM Training Program in Biomedical Informatics and Data Science: Approved electives

## Rice University

See [this link](#) to the course catalog; the form and deadlines for [inter-institutional course registration](#) for non-Rice PhD students (See under Graduate Students); and the form for Visiting Auditor Registration for postdocs here (under Visiting Students): [https://registrar.rice.edu/online\\_forms#VS](https://registrar.rice.edu/online_forms#VS).

Rice does not post course schedules for the entire academic year, but rather posts the following semester's course schedule towards the end of the prior semester (~in late March for Fall semester courses, late October for Spring courses). Therefore, look at past semesters/years to learn whether a course is offered in the Fall or Spring semester so you can plan your curriculum timeline. Course catalog (Note that not all courses in the catalog are currently offered.): [https://courses.rice.edu/admweb!/SWKSCAT.cat?p\\_action=cata](https://courses.rice.edu/admweb!/SWKSCAT.cat?p_action=cata). Course schedule: <https://courses.rice.edu/courses!/SWKSCAT.cat>.

Academic calendar for deadlines and course dates: <https://registrar.rice.edu/calendars>.

### Bioengineering

BIOE 548	Neural Signal Processing (Cross-list ELEC 548)
BIOE 552	Intro to Computational Systems Biology: Modeling & Design Principles of Biochemical Networks
BIOE 564	Bioinformatics: Network Analysis (Cross-list COMP 572)
BIOE 589	Computational Molecular Bioengineering/Biophysics
BIOE 591	Fundamentals of Medical Imaging I (Cross-list ELEC 585)
BIOE 682	Systems Biology of Human Diseases (Cross-list CHBE 682)

### Chemical & Biomolecular Engineering

CHBE 682	Systems Biology of Human Diseases (Cross-list BIOE 682)
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### Computer Science

COMP 502	Neural Machine Learning I (Cross-list ELEC 502, STAT 502)
COMP 503	Reasoning about Software
COMP 504	Graduate Object-Oriented Programming and Design
COMP 505	Advanced Topics in Object-Oriented Design
COMP 519	Genome-scale Algorithms
COMP 520	Distributed Systems (Cross-list ELEC 520)
COMP 522	Multi-core Computing
COMP 524	Mobile and Wireless Networking (Cross-list ELEC 524)
COMP 527	Computer Systems Security
COMP 530	Database System Implementation
COMP 534	Parallel Computing
COMP 539	Software Engineering Methodology
COMP 540	Statistical Machine Learning
COMP 541	Introduction to Computer Security
COMP 542	Large-Scale Machine Learning
COMP 550	Algorithmic Robotics (Cross-list ELEC 550)
COMP 556	Introduction to Computer Networks (Cross-list ELEC 556)
COMP 557	Artificial Intelligence (Cross-list ELEC 557)
COMP 571	Bioinformatics: Sequence Analysis
COMP 572	Bioinformatics: Network Analysis (Cross-list BIOE 564)
COMP 576	Introduction to Deep Learning (Cross-list ELEC 576)
COMP 602	Neural Machine Learning II (Cross-list ELEC 602, STAT 602)
COMP 665	Visualization

### Electrical and Computer Engineering

ELEC 502	Neural Machine Learning I (Cross-list COMP 502, STAT 502)
ELEC 520	Distributed Systems (Cross-list COMP 520)
ELEC 524	Mobile and Wireless Networking (Cross-list COMP 524)

ELEC 531	Statistical Signal Processing
ELEC 546	Computer Vision
ELEC 548	Neural Signal Processing (Cross-list BIOE 548)
ELEC 550	Algorithmic Robotics (Cross-list COMP 550)
ELEC 556	Introduction to Computer Networks (Cross-list COMP 556)
ELEC 557	Artificial Intelligence (Cross-list COMP 557)
ELEC 559	Mobile Health
ELEC 573	Network Science and Analytics
ELEC 576	Introduction to Deep Learning (Cross-list COMP 576)
ELEC 577	Optimization for Data Science
ELEC 585	Fundamentals of Medical Imaging I (Cross-list BIOE 585)
ELEC 602	Neural Machine Learning II (Cross-list COMP 602, STAT 602)

#### Statistics

STAT 502	Neural Machine Learning I (Cross-list COMP 502, ELEC 502)
STAT 525	Bayesian Statistics (formerly STAT 622 Bayesian Data Analysis)
STAT 541	Multivariate Analysis
STAT 545	Generalized Linear Models (GLM) & Categorical Data Analysis
STAT 549	Functional Data Analysis
STAT 550	Nonparametric Function Estimation
STAT 552	Applied Stochastic Processes
STAT 553	Biostatistics
STAT 581	Mathematical Probability I
STAT 602	Neural Machine Learning II (Cross-list COMP 602, ELEC 602)
STAT 605	R for Data Science
STAT 606	SAS Statistical Programming
STAT 615	Regression and Linear Models
STAT 616	Advanced Statistical Methods
STAT 623	Probability in Bioinformatics and Genetics
STAT 648	Graphical Models and Networks

To request that a course may be added as an approved elective, please provide a syllabus and course description to the NLM Training Program administrator Melissa at [glueck@rice.edu](mailto:glueck@rice.edu).

## **Baylor College of Medicine**

See links to the academic calendar and course schedule, and course descriptions under Graduate School Bulletin here (see link on left side): <https://www.bcm.edu/education/graduate-school-of-biomedical-sciences/curriculum>.

GS-CP-6602	Computational Molecular Biophysics and Structural Biology (formerly GS-SB-402)
GS-GG-6301	Bioinformatics and Genome Analysis (formerly GS-GE-459)
GS-GS-6203	Data Mining (formerly Intro to Data Mining GS-GE-402)
GS-GS-6400	Foundations B: Biostatistics (formerly Biostatistics for Biomed. and Transl. Researchers GS-GS-532)
GS-NE-6201	Neural Systems
GS-QC-6201	Applications to Biology of Computation (formerly GS-GS-527)
GS-QC-6301	Practical Introduction to Programming for Scientists (formerly GS-SB-406)
GS-QC-6302	Computer-Aided Discovery Methods (formerly GS-SB-405)
GS-QC-6801	Computational Mathematics for Quantitative Biomedicine (formerly GS-SB-401)

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## **University of Houston**

### Graduate course catalog.

UH offers a wide range of equivalent classes to the ones listed under Rice University that can be considered, particularly at the Colleges of Natural Sciences and Mathematics, and the College of Pharmacy.

BIOE 6301	Statistical Methods in BME
BIOE 6306	Advanced Artificial Neural Networks
BIOE 6342	Biomedical Signal Processing
BTEC 6304	Computational Methods in Biotechnology
COSC 6339	Big Data Analytics
COSC 6344	Visualization
COSC 6368	Artificial Intelligence
COSC 6370	Medical Imaging
COSC 6374	Parallel Computations
ECE 6356	Introduction to Machine Learning
ECE 6397	Parallel Algorithms for GPUs and Heterogeneous Systems

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## **MD Anderson / UT Health Science Center at Houston - Graduate School of Biomedical Sciences**

[Link to GSBS courses.](#)

GS01-1033	Introduction to Biostatistics and Clinical Trials
GS01-1143	Introduction to Bioinformatics
GS02-1104	Introduction to Medical Physics II; Medical Imaging

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## **UT Health Science Center at Houston – McWilliams School of Biomedical Informatics (SBMI)**

[Link to SBMI courses](#); see the link on the left side of that page for the current Semester Schedule.

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BMI 5004	Introduction to Clinical Healthcare
BMI 5301	The U.S. Healthcare System
BMI 5302	Human Factors in Healthcare
BMI 5304	Advanced Database Concepts in Biomedical Informatics
BMI 5306	Security for Health Information Systems
BMI 5311	Foundations of Biomedical Information Sciences II
BMI 5313	Foundations of Electronic Health Records and Clinical Information Systems
BMI 5315	Quality and Outcome Improvement in Healthcare
BMI 5331	Foundations of Pharmacogenomics
BMI 5332	Statistical Analysis of Genomic Data
BMI 5351	Research Design and Evaluation in Biomedical Informatics
BMI 5353	Biomedical Data Analysis
BMI 5354	Cognitive Engineering in Biomedical Informatics
BMI 5360	Clinical Decision Support Systems
BMI 6300	Advanced Health Information Technology
BMI 6301	Health Data Display
BMI 6303	Introduction to Telehealth
BMI 6306	Information and Knowledge Representation in Biomedical Informatics
BMI 6309	Healthcare Interface Design
BMI 6311	Advanced Decision Analysis
BMI 6315	Advanced Electronic Health Records
BMI 6319	Data Analysis for Sci Research in BMI (formerly Advanced Data Structures in Biomedical Informatics)

BMI 6322	Distributional Semantics: Methods and Biomedical Applications
BMI 6323	Machine Learning in Biomedical Informatics
BMI 6330	Health Care Delivery in an EHR Enabled Environment: Biomedical NLP
BMI 6331	Medical Imaging and Signal Pattern Recognition
BMI 6334	Deep Learning in Biomedical Informatics

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## UT Medical Branch at Galveston

UTMB's Graduate School of Biomedical Sciences does not have an open course search; search under [GSBS Courses by Program](#), then under [Degree Programs](#) for contact information, e.g. contact Population Health Sciences (PHS) for bioinformatics-type courses. To request that a course may be added as an approved elective, please provide a syllabus and course description to the NLM Training Program administrator Melissa at [glueck@rice.edu](mailto:glueck@rice.edu).

### Biochemistry and Molecular Biology (BMB)

BMB 6216	Practical Algorithms for Bioinformatics and Systems Biology; offered in Spring semester
BMB 6240	Probabilistic and Statistical Methods in Bioinformatics; offered in Fall semester

### Population Health Sciences (PHS)

PHS 6313	Longitudinal Data Analysis; offered in Summer semester
PHS 6341	Categorical Data Analysis; offered in Summer semester
PHS 6343	Biostatistics; offered in Fall semester
PHS 6344	Introduction to Linear Models; offered in Spring semester
PHS 6345	Introduction to Bioinformatics; offered in Fall semester
PHS 6354	Linear Models; offered in Fall semester

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