



## College of Engineering

DEPARTMENT OF COMPUTER  
& INFORMATION SCIENCES

101 Smith Hall  
Newark, DE 19716  
Phone: 302.831.2711  
Fax: 302.831.8458  
Email: [krystalp@udel.edu](mailto:krystalp@udel.edu)

November 1, 2018

Cathy H. Wu, Ph.D.

Unidel Edward G. Jefferson Chair in Engineering and Computer Science

Director, Data Science Institute

Director, Center for Bioinformatics and Computational Biology

Delaware Biotechnology Institute University of Delaware

15 Innovation Way, Suite 205

Newark, DE 19711

Dear Dr. Wu,

The Department of Computer & Information Sciences will support the following courses for inclusion in the PhD in Bioinformatics Data Science curriculum. By supporting these courses, we acknowledge our intent to teach these courses on a regular basis and to admit students in the PhD Program in Bioinformatics Data Science into these courses as appropriate.

CISC 640	Computer Graphics
CISC 642	Introduction to Computer Vision
CISC 650	Computer Networks
CISC 667	Introduction to Human-Computer Interaction
CISC 675	Object Oriented Software Engineering
CISC 681	Artificial Intelligence
CISC 683	Introduction to Data Mining
CISC 684	Introduction to Machine Learning
CISC 844	Computational Biomedicine
CISC 849	Advanced Topics in Computer Applications
CISC 889	Advanced Topics in Artificial Intelligence

The Department of Computer & Information Sciences is pleased to contribute to the education of students in this important area. Interdisciplinary programs such as the PhD in Bioinformatics Data Science are a benefit to the University of Delaware and to our society.

Sincerely,

Kathleen F. McCoy

Professor and Chair



College of  
Health Sciences

SCHOOL OF NURSING

The Tower at STAR  
Newark, DE 19713  
Phone: 302-831-1253  
Fax: 302-831-2382  
Email: [ud-nursing@udel.edu](mailto:ud-nursing@udel.edu)

November 1, 2018

Cathy H. Wu, Ph.D.

Unidel Edward G. Jefferson Chair in Engineering and Computer Science  
Director, Data Science Institute  
Director, Center for Bioinformatics and Computational Biology  
Delaware Biotechnology Institute University of Delaware  
15 Innovation Way, Suite 205  
Newark, DE 19711

Dear Dr. Wu,

The School of Nursing will support the following courses for inclusion in the PhD in Bioinformatics Data Science curriculum. By supporting these courses we acknowledge our intent to teach these courses on a regular basis and to admit non-majors into these course as appropriate.

NURS/HLTH 844      Population Healthcare Informatics

The School of Nursing is pleased to contribute to the education of students in this important area. Interdisciplinary programs such as the PhD in Bioinformatics Data Science are a benefit to the University of Delaware and to our society.

Sincerely,

A handwritten signature in black ink that reads 'Barbara Habermann'.

Barbara Habermann PhD RN FAAN  
Interim Senior Associate Dean for Nursing  
Nannie Longfellow Professor of Nursing  
Associate Dean for Translational Research  
302-831-8369  
The Tower at STAR, 5th floor  
100 Discovery Boulevard  
Newark, DE 19713



Carpenter Sports Building  
Newark, DE 19716-3750  
Phone: 302-831-2265  
Fax: 302-831-4261

## College of Health Sciences

DEPARTMENT OF  
BEHAVIORAL HEALTH & NUTRITION

November 1, 2018

Cathy H. Wu, Ph.D.

Unidel Edward G. Jefferson Chair in Engineering and Computer Science  
Director, Data Science Institute  
Director, Center for Bioinformatics and Computational Biology  
Delaware Biotechnology Institute University of Delaware  
15 Innovation Way, Suite 205  
Newark, DE 19711

Dear Dr. Wu,

The Department of Behavioral Health & Nutrition will support the following courses for inclusion in the PhD in Bioinformatics Data Science curriculum. By supporting this course, we acknowledge our intent to teach these courses on a regular basis and to admit non-majors into these course as appropriate.

BHAN 856      Multivariable Biostatistics

The Department of Behavioral Health & Nutrition is pleased to contribute to the education of students in this important area. Interdisciplinary programs such as the PhD in Bioinformatics Data Science are a benefit to the University of Delaware and to our society.

If I can be of any further assistance please feel free to contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read 'M. Peterson'.

Michael Peterson, Ed.D.  
Professor and Chairman  
Department of Behavioral Health and Nutrition  
Email: [mpeter@udel.edu](mailto:mpeter@udel.edu)  
Phone: 302-831-2265



DEPARTMENT OF  
BIOLOGICAL SCIENCES  
OFFICE OF THE CHAIR

University of Delaware  
Newark, Delaware 19716-2590  
Ph: 302/831-4296  
Fax: 302/831-2281

E. Fidelma Boyd, Ph.D.  
Professor and Interim Chair  
Department of Biological Sciences  
118C Wolf Hall  
Telephone (302) 831-4296  
E-mail: [fboyd@udel.edu](mailto:fboyd@udel.edu)

TO: Faculty Senate Academic Affairs Committee

FROM: Professor E. Fidelma Boyd, Interim Chair

RE: Center for Bioinformatics and Computational Biology, Letter of Support

November 2<sup>nd</sup>, 2018

Dear Faculty Senate Academic Affairs Committee,

The Department of Biological Sciences will support the following courses for inclusion in the PhD in Bioinformatics Data Science curriculum as electives.

BISC 605	Advanced Mammalian Physiology
BISC 609	Molecular Biology of the Cell
BISC 625	Cancer Biology
BISC 654	Biochemical Genetics
BISC 690	Fundamentals of Pharmacology
BISC 833	Special Topics in Biology: Grant Writing

The department looks forward to the program's continued success.

Sincerely,

A handwritten signature in blue ink, appearing to read "F. Boyd".

E. Fidelma Boyd  
Professor and Interim Chair

November 2, 2018

Cathy H. Wu, Ph.D.  
Unidel Edward G. Jefferson Chair in Engineering and Computer Science  
Director, Data Science Institute  
Director, Center for Bioinformatics and Computational Biology  
Delaware Biotechnology Institute University of Delaware  
15 Innovation Way, Suite 205  
Newark, DE 19711

Dear Dr. Wu,

Dear Dr. Wu,

The Department of Chemistry & Biochemistry will support the following course for inclusion in the PhD in Bioinformatics Data Science curriculum. By supporting this course, we acknowledge our intent to teach this course on a regular basis and to admit non-majors into this course as appropriate.

CHEM 641 Biochemistry

The Department of Chemistry & Biochemistry is pleased to contribute to the education of students in this important area. Interdisciplinary programs such as the PhD in Bioinformatics Data Science are a benefit to the University of Delaware and to our society.

Sincerely,



Brian J. Bahnson, Ph.D.  
Professor and Chair of the Department of Chemistry & Biochemistry



From: Lou Rossi  
Chair, Department of Mathematical Sciences

A handwritten signature in black ink, appearing to read 'L. Rossi'.

Date: 1 November 2018

Re: Support for Bioinformatics & Systems Biology permanent status and name change.

To: Dr. Wu and Colleagues

The Department of Mathematical Sciences fully supports the Center for Bioinformatics and Computational Biology (CBCB) efforts to change the degree name from the PhD in Bioinformatics & Systems Biology to the PhD in Bioinformatics Data Science.

We have ample capacity to enroll these students in our Math 637 Mathematical Techniques in Data Science course which is now an elective. We intend to offer it on a regular basis.

The PhD program leverages research strengths, education resources, and bioinformatics infrastructure from fifteen participating departments across the Colleges of Arts & Sciences, Engineering, Agriculture & Natural Resources, Health Sciences, and Earth, Ocean & Environment, as well as the Delaware Biotechnology Institute. Changing the name to PhD in Bioinformatics Data Science accurately reflects the educational program and expands the PhD degree to encompass multiple fields of study, ranging from health informatics, translational medicine, artificial intelligence, and machine learning.

The name Bioinformatics Data Science allows the PhD degree to achieve the interdisciplinary learning objectives and globally represents diversity in teaching, research, and the mission of the center "To promote, coordinate, and support interdisciplinary activities."

Please let me know if there are any questions.



College of Earth, Ocean,  
& Environment  
SCHOOL OF MARINE SCIENCE & POLICY

Hugh R. Sharp Campus  
700 Pilottown Road  
Lewes, DE 19958-1298 U.S.A.

November 2, 2018

Cathy H. Wu, Ph.D.  
Unidel Edward G. Jefferson Chair in Engineering and Computer Science  
Director, Data Science Institute  
Director, Center for Bioinformatics and Computational Biology  
Delaware Biotechnology Institute University of Delaware  
15 Innovation Way, Suite 205  
Newark, DE 19711

Dear Dr. Wu,

The School of Marine Science & Policy will support the following courses for inclusion in the PhD in Bioinformatics Data Science curriculum. By supporting these courses we acknowledge our intent to teach these courses on a regular basis and to admit non-majors into these course as appropriate.

MAST 607 Writing Papers in the Marine Sciences

MAST 626 Microbial Molecular Genetics

The School of Marine Science & Policy is pleased to contribute to the education of students in this important area. Interdisciplinary programs such as the PhD in Bioinformatics Data Science are a benefit to the University of Delaware and to our society.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark A. Moline'.

Mark A. Moline  
Director, School of Marine Science and Policy



## College of Engineering

DEPARTMENT OF MECHANICAL  
ENGINEERING

126 Spencer Laboratory  
Newark, DE 19716  
Phone: 302.831.2421  
Fax: 302.831.3619  
Email: [info@me.udel.edu](mailto:info@me.udel.edu)

November 1, 2018

Cathy H. Wu, Ph.D.  
Unidel Edward G. Jefferson Chair in Engineering and Computer Science  
Director, Data Science Institute  
Director, Center for Bioinformatics and Computational Biology  
Delaware Biotechnology Institute  
University of Delaware  
15 Innovation Way, Suite 205  
Newark, DE 19711

Dear Dr. Wu,

The Department of Mechanical Engineering will support the following elective course for inclusion in the PhD in Bioinformatics Data Science curriculum. By supporting this course we acknowledge our intent to teach this course on a regular basis and to admit non-majors into this course as appropriate.

MEEG 621      Linear Systems

The Department of Mechanical Engineering is pleased to contribute to the education of students in this important area. Interdisciplinary programs such as the PhD in Bioinformatics Data Science are a benefit to the University of Delaware and to our society.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ajay K. Prasad'.

Ajay K. Prasad, PhD  
Engineering Alumni Distinguished Professor and Chair  
Department of Mechanical Engineering  
Ph: (302) 831-2960  
Email: [prasad@udel.edu](mailto:prasad@udel.edu)





Plant & Soil Sciences  
Townsend Hall, Rm. 152  
531 S. College Avenue  
Newark, DE 19716-2170  
Phone: 302-831-2531

November 2, 2018

Cathy H. Wu, Ph.D.  
Unidel Edward G. Jefferson Chair in Engineering and Computer Science  
Director, Data Science Institute  
Director, Center for Bioinformatics and Computational Biology  
Delaware Biotechnology Institute University of Delaware  
15 Innovation Way, Suite 205  
Newark, DE 19711

Dear Dr. Wu,

The Department of Plant and Soil Sciences will support the following courses for inclusion in the PhD in Bioinformatics Data Science curriculum. By supporting these courses we acknowledge our intent to teach these courses on a regular basis and to admit non-majors into these courses as appropriate.

PLSC 667	Applications of Genome Science: From Microbes to Mammals
PLSC 671	Paradigms in Cell Signaling

The Department of Plant and Soil Sciences is pleased to contribute to the education of students in this important area. Interdisciplinary programs such as the PhD in Bioinformatics Data Science are a benefit to the University of Delaware and to our society.

Respectfully,

A handwritten signature in black ink that reads 'Erik Ervin'.

Erik Ervin, Ph.D.  
Chair and Professor



Applied Economics & Statistics  
213 Townsend Hall  
531 S. College Avenue  
Newark, DE 19716-2130  
Phone: 302-831-2511  
Fax: 302-831-6243

## Statistics Program

Thomas W. Ilvento  
Professor and Chair  
213 Townsend Hall  
Office: 302-831-6773  
Cell: 302-690-3835  
ilvento@udel.edu

November 1, 2018

Cathy H. Wu, Ph.D.  
Unidel Edward G. Jefferson Chair in Engineering and Computer Science  
Director, Data Science Institute  
Director, Center for Bioinformatics and Computational Biology  
Delaware Biotechnology Institute University of Delaware  
15 Innovation Way, Suite 205  
Newark, DE 19711

Dear Dr. Wu,

The Department of Applied Economics & Statistics will support the following courses for inclusion in the PhD in Bioinformatics Data Science curriculum. By supporting these courses we acknowledge our intent to teach these courses on a regular basis and to admit non-majors into these course as appropriate.

STAT 611    Regression Analysis  
STAT 612    Advanced Regression Techniques  
STAT 617    Multivariate Methods  
STAT 621    Survival Analysis  
STAT 674    Applied Data Base Management

The Department of Applied Economics & Statistics is pleased to contribute to the education of students in this important area. Interdisciplinary programs such as the PhD in Bioinformatics Data Science are a benefit to the University of Delaware and to our society.

Sincerely,

Thomas W. Ilvento, Professor and Chair



Department of Electrical  
& Computer Engineering

OFFICE OF THE CHAIR

Newark, DE 19716-3130

Phone: 302-831-6699

Fax: 302-831-4375

November 1, 2018

Cathy H. Wu, Ph.D.

Unidel Edward G. Jefferson Chair in Engineering and Computer Science

Director, Data Science Institute

Director, Center for Bioinformatics and Computational Biology

Delaware Biotechnology Institute University of Delaware

15 Innovation Way, Suite 205

Newark, DE 19711

Dear Dr. Wu,

The Department of Electrical & Computer Engineering will support the following courses for inclusion in the PhD in Bioinformatics Data Science curriculum. By supporting these courses we acknowledge our intent to teach these courses on a regular basis and to admit non-majors into these course as appropriate.

ELEG 671      Mathematical Physiology

The Department of Electrical & Computer Engineering is pleased to contribute to the education of students in this important area. Interdisciplinary programs such as the PhD in Bioinformatics Data Science are a benefit to the University of Delaware and to our society.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kenneth E. Barner'.

Kenneth E. Barner

Charles Black Evans Professor and Chair



College of Health Sciences

DEPARTMENT OF KINESIOLOGY  
& APPLIED PHYSIOLOGY

November 7, 2018

Cathy H. Wu, Ph.D.  
Unidel Edward G. Jefferson Chair in Engineering and Computer Science  
Director, Data Science Institute  
Director, Center for Bioinformatics and Computational Biology  
Delaware Biotechnology Institute University of Delaware  
15 Innovation Way, Suite 205  
Newark, DE 19711

Dear Dr. Wu,

The Department of Kinesiology & Applied Physiology will support the following courses for inclusion in the PhD in Bioinformatics Data Science curriculum. By supporting these courses we acknowledge our intent to teach these courses on a regular basis and to admit non-majors into these course as appropriate.

KAAP 602                      Data Analysis and Interpretation in Health Sciences

The Department of Kinesiology & Applied Physiology is pleased to contribute to the education of students in this important area. Interdisciplinary programs such as the PhD in Bioinformatics Data Science are a benefit to the University of Delaware and to our society.

Sincerely,

A handwritten signature in black ink, appearing to read 'JJJ', followed by a long horizontal stroke.

John J. Jeka, Ph.D.  
Chair & Professor



Department of Business Administration  
236 Alfred Lerner Hall  
Newark, DE 19716

November 7, 2018

Cathy H. Wu, Ph.D.  
Unidel Edward G. Jefferson Chair in Engineering and Computer Science  
Director, Data Science Institute  
Director, Center for Bioinformatics and Computational Biology  
Delaware Biotechnology Institute University of Delaware  
15 Innovation Way, Suite 205  
Newark, DE 19711

Dear Dr. Wu,

The Department of Business Administration fully supports offering BUAD840 (Ethical Issues in Global Business Environments) as an elective in the PhD in Bioinformatics Data Science.

I look forward to the program's continued success.

Best Regards,

A handwritten signature in black ink that reads 'Hemant Kher'.

Hemant V. Kher, PhD.  
Professor and Chair  
Department of Business Administration



Department of Chemical  
& Biomolecular Engineering

OFFICE OF THE CHAIR

Newark, DE 19716-3110  
Phone: 302-831-0102/8155  
Fax: 302-831-8201

November 9, 2018

Cathy H. Wu, Ph.D.

Unidel Edward G. Jefferson Chair in Engineering and Computer Science

Director, Data Science Institute

Director, Center for Bioinformatics and Computational Biology

Delaware Biotechnology Institute University of Delaware

15 Innovation Way, Suite 205

Newark, DE 19711

Dear Dr. Wu,

The Department of Chemical & Biomolecular Engineering will support the following course for inclusion in the Ph.D. in Bioinformatics Data Science curriculum. By supporting this course we acknowledge our intent to teach this course on a regular basis and to admit non-majors into this course as appropriate.

CHEG 621

Metabolic Engineering

The Department of Chemical & Biomolecular Engineering is pleased to contribute to the education of students in this important area. Interdisciplinary programs such as the Ph.D. in Bioinformatics Data Science are a benefit to the University of Delaware and to our society.

Sincerely,

A handwritten signature in black ink, appearing to read 'Eric M. Furst', with a long horizontal line extending to the right.

Eric M. Furst

Professor and Department Chair