Program Change Request

Date Submitted: 12/22/21 2:04 pm

Viewing: DTSCBS-BIOF : Data Science: Bioinformatics Concentration

Last approved: 05/18/21 6:47 pm

Last edit: 01/06/22 11:11 am

Changes proposed by: schubert

Catalog Pages Using this Program

Data Science B.S. with Bioinformatics Concentration

Data Science (DTSC)

Submitter: User ID: schubert Phone: 5-2264

Program Status Active

Academic Level Undergraduate

Type of proposal Concentration

Select a reason for this modification

Making Minor Changes to an Existing Certificate or Degree (e.g. changing 15 or fewer hours, changing admission/graduation requirements, adding/changing Focused Study or Track)

Effective Catalog Year Fall 2022

College/School Code

College of Engineering (ENGR)

Department Code

Department of Engineering Dean (ENGD)

Program Code DTSCBS-BIOF

Degree Bachelor of Science

CIP Code

In Workflow

1. ENGR Dean Initial
2. Director of Curriculum Review and Program Assessment
3. Registrar Initial
4. Institutional Research
5. ENGD Chair
6. ENGR Curriculum Committee
7. ENGR Faculty
8. ENGR Dean
9. ARSC Dean
10. WCOB Dean
11. Global Campus
12. Provost Review
13. University Course and Program Committee
14. Faculty Senate
15. Provost Final
16. Registrar Final
17. Catalog Editor Final

Approval Path

1. 12/23/21 2:24 pm Kevin Hall (kdhall): Approved for ENGR Dean Initial
2. 01/05/22 1:09 pm Alice Griffin (agriffin): Approved for Director of

Curriculum Review and Program Assessment

3. 01/06/22 1:23 pm Gina Daugherty (gdaugher): Approved for Registrar Initial
4. 01/06/22 3:50 pm Doug Miles (dmiles): Approved for Institutional Research
5. 01/20/22 1:11 pm Kevin Hall (kdhall): Approved for ENGD Chair
6. 01/20/22 1:16 pm Manuel Rossetti (rossetti): Approved for ENGR Curriculum Committee
7. 01/20/22 3:21 pm Kevin Hall (kdhall): Approved for ENGR Faculty
8. 01/20/22 3:41 pm Kevin Hall (kdhall): Approved for ENGR Dean
9. 01/20/22 4:10 pm Jeannie Hulen (jhulen): Approved for ARSC Dean
10. 01/25/22 11:12 am Karen Boston (kboston): Approved for WCOB Dean

11. 01/25/22 11:22 am Suzanne Kenner (skenner): Approved for Global Campus
12. 02/02/22 8:44 am Ketevan Mamiseishvili (kmamisei): Approved for Provost Review

History

1. May 7, 2020 by Lisa Kulczak (lkulcza)
2. May 8, 2020 by Charlie Alison (calison)
3. May 18, 2021 by Karl Schubert (schubert)

30.3001 - Computational Science.

Program Title

Data Science: Bioinformatics Concentration

Program Delivery Method

On Campus

Is this program interdisciplinary?

Yes

College(s)/School(s)

College/School Name
College of Engineering (ENGR)
Fulbright College of Arts and Sciences (ARSC)
Walton College of Business (WCOB)

Does this proposal impact any courses from another College/School?

No

What are the total hours needed to complete the program?	21

Program Requirements and Description

Requirements

Required Bioinformatics Concentration Courses

BIOL 2533	Cell Biology	3
BIOL 2323	General Genetics	3
Choose one of the following courses:		3
BIOL 3023	Evolutionary Biology	
BIOL 3863	General Ecology	
Elective Bioinformatics Concentration Courses (Select 12 hours)		12
Note: May not fulfill concentration electives with all GIS courses		
BIOL 4174	Conservation Genetics	
BIOL 4223	Bacterial Lifestyles	
BIOL 480V	Special Topics in Biological Sciences	
BIOL 5153	Practical Programming for Biologists	
BIOL 580V	Special Topics in Biological Sciences	
GEOS 3543	Geospatial Applications and Information Science	
GEOS 3553	Spatial Analysis Using ArcGIS	
GEOS 3563	Geospatial Data Mining	
GEOS 4553	Introduction to Raster GIS	
Total Hours		21

8-Semester Plan

Data Science B.S. with Bioinformatics Concentration Eight-Semester Program

First Year	Units Fall	Spring
MATH 2554 Calculus I (ACTS Equivalency = MATH 2405) (Satisfies General Education Outcome 2.1)	1 4	
BIOL 1543 Principles of Biology (ACTS Equivalency = BIOL 1014 Lecture)	4	
& BIOL 1541L Principles of Biology Laboratory (ACTS Equivalency = BIOL 1014 Lab)		
ENGL 1013 Composition I (ACTS Equivalency = ENGL 1013) (Satisfies General Education Outcome	3	

1.1)		
Satisfies General Education Outcome 3.4:		
DASC 1001 Introduction to Data Science	1	
DASC 1104 Programming Languages for Data Science	4	
MATH 2564 Calculus II (ACTS Equivalency = MATH 2505)		4
Satisfies General Education Outcome 3.4:		
CHEM 1103 University Chemistry I (ACTS Equivalency = CHEM 1414 Lecture)		4
& CHEM 1101L University Chemistry I Laboratory (ACTS Equivalency = CHEM 1414 Lab)		
ENGL 1033 Technical Composition II (ACTS Equivalency = ENGL 1023) (Satisfies General Education Outcome 1.2)		3
DASC 1204 Introduction to Object Oriented Programming for Data Science		4
DASC 1222 Role of Data Science in Today's World		2
Year Total:	16	17

Second Year	Units	
	Fall	Spring
DASC 2594 Multivariable Math for Data Scientists	4	
INEG 2313 Applied Probability and Statistics for Engineers I4	**3**	
or STAT 3013 Introduction to Probability		
DASC 2213 Data Visualization and Communication	3	
DASC 2113 Principles and Techniques of Data Science	3	
~~BIOL 2533 Cell Biology~~	~~3~~	-
~~Bioinformatics Elective~~	~~3~~	-
State Minimum Core Fine Arts Elective (Satisfies General Education Outcome 3.1)2	**3**	
SEVI 2053 Business Foundations (Data Science Majors-only section)		**3**
INEG 2333 Applied Probability and Statistics for Engineers II4		**3**
or STAT 3003 Statistical Methods		
DASC 2103 Data Structures & Algorithms		3
DASC 2203 Data Management and Data Base		3
~~INEG 2313 Applied Probability and Statistics for Engineers I4~~	-	~~3~~
~~or STAT 3013 Introduction to Probability~~		
BIOL 2323 General Genetics		3
~~SEVI 2033 Business Foundations for Innovators and Entrepreneurs~~	-	~~3~~
Year Total:	16	15

Third Year	Units	
	Fall	Spring
PHIL 3103 Ethics and the Professions (Satisfies General Education Outcome 5.1)	3	
DASC 3103 Cloud Computing and Big Data	3	
~~INEG 2333 Applied Probability and Statistics for Engineers II4~~	~~3~~	-
~~or STAT 3003 Statistical Methods~~		

~~BIOL 3863 General Ecology~~	~~3~~	-
~~or BIOL 3023 Evolutionary Biology~~		
~~Bioinformatics Elective~~	~~3~~	-
BIOL 2533 Cell Biology	**3**	
ECON 2143 Basic Economics: Theory and Practice (Satisfies General Education Outcome 3.3)	**3**	
State Minimum Core Social Sciences Elective (Satisfies General Education Outcomes 3.3 and 4.1)2	**3**	
DASC 3203 Optimization Methods in Data Science		3
DASC 3213 Statistical Learning		3
~~ECON 2143 Basic Economics: Theory and Practice (Satisfies General Education Outcome 3.3)~~	-	~~3~~
~~Bioinformatics Elective~~	-	~~3~~
BIOL 3023 Evolutionary Biology		**3**
or BIOL 3863 General Ecology		
State Minimum Core U.S. History or Government Elective (Satisfies General Education Outcome 4.2)2		**3**
State Minimum Core Social Sciences Elective (Satisfies General Education Outcomes 3.2 and 3.3)2		3
Year Total:	15	15

Fourth Year	Units	
	Fall	Spring
DASC 4892 Data Science Practicum I	2	
DASC 4113 Machine Learning	3	
DASC 4123 Social Problems in Data Science and Analytics	3	
Bioinformatics Elective	3	
~~State Minimum Core Fine Arts Elective (Satisfies General Education Outcome 3.1)3~~	~~3~~	-
Bioinformatics Elective	**3**	
DASC 4993 Data Science Practicum II (Satisfies General Education Outcome 6.1)		3
~~State Minimum Core Social Sciences Elective (Satisfies General Education Outcomes 3.3 and 4.1)4~~	-	~~3~~
Bioinformatics Elective		3
Bioinformatics Elective		**3**
General Education Elective3		3
Year Total:	14	12

Total Units in Sequence: 120

1 Students have demonstrated successful completion of the learning indicators identified for learning outcome 2.1, by meeting the prerequisites for MATH 2554.

2 Students must complete the State Minimum Core requirements as outlined in the Catalog of Studies. The courses that meet the state minimum core also fulfill many of the university's General Education requirements, although there are additional considerations to satisfy the general education learning outcomes. Students are encouraged to consult with their academic adviser when making course selections.

3 **Students are required to complete 40 hours of upper-division courses (3000-4000 level). It is recommended that students consult with their adviser when making course selections.**

4 Data Science Statistics and Computational Analytics Concentration students are advised to select STAT 3013/STAT 3003 to meet the prerequisites required in the concentration.

5 ~~**Students are required to complete 40 hours of upper division courses (3000-4000 level). It is recommended that students consult with their adviser when making course selections.**~~

Are Similar Programs available in the area?

No

Estimated Student Demand for Program	See DTSCBS PLAN
Scheduled Program Review Date	See DTSCBS PLAN

Program Goals and Objectives

Program Goals and Objectives
See DTSCBS PLAN

Learning Outcomes

Learning Outcomes
See DTSCBS PLAN

Description and justification of the request

Description of specific change	Justification for this change
Corrections were made to match the original Program-wide 8-semester plan.	Ensuring the Data Science Program cohorts are cohesive and managing student advising in the original Program-wide 8-semester plan.

Upload attachments

Reviewer Comments

Alice Griffin (agriffin) (01/05/22 12:38 pm): Replaced Bioinformatics Elective with BIOL 3023 or BIOL 3863 in the spring semester of the third year with input from submitter.

Gina Daugherty (gdaugher) (01/06/22 11:11 am): Adjusted inline course references.

Key: 743