— Curriculog Form URL: https://charlotte.curriculog.com/proposal:8316/form
— NOTE: This proposal was launched on Sept 17, 2023 but it is eleven (11) approval steps away from reaching the Graduate Council (GC).
The GC will review the proposal offline with the understanding that the GC Chair may approve the proposal on behalf of the GC when the Curriculog form reaches the GC approval level provided: 1) Any changes recommended by the GC are implemented by the time the Curriculog Form makes it to the GC step, and 2) the GC approves the proposal with recommended changes, if any, at the meeting of Tues, Oct 3, 2023.

Data Science, Ph.D. - (New Graduate Program - Request to Establish)

New Degree Program - Part Two: Request to Establish [2023-2024 Catalog]

Proposal Purpose & Instructions

Purpose: This form is used for the creation of a new degree. UNC CHARLOTTE ACADEMIC PROCEDURE: NEW DEGREE PROGRAMS - PART II: REQUEST TO ESTABLISH

Instructions:

STEP 1 - Complete Section A and Section B

STEP 2 - Launch the proposal (details in Section C)

STEP 3 - Approve the proposal (details in Section D)

Proposal Tips:

Collapse/open sections by clicking ^ or section heading
Attach files using Files in toolbox at right
View the steps to approval: Graduate Workflow, Undergraduate Workflow
Additional help and resources available on the Faculty Governance website

Section A: Proposal Content

STEP 1 - Complete Section A and Section B

(A1 Help) Can be effective Fall 2022 only if proposal reaches Banner Step by April 30, 2022 (for processing prior to Catalog publication). Curriculum Deadlines

(A1.a) Requested Effective Term:* Fall 2024

(A1.b) [System Administrator only]

(A2 Help) Training Doc: How to select Originating Department or Unit

(A2) Originating Department or Unit* Interdisciplinary Data Science

(A3) College of Originating Unit*
- [ ] College of Arts + Architecture
- [x] College of Business '
- [x] College of Computing and Informatics '
- [ ] College of Education
- [x] College of Engineering '
- [x] College of Health and Human Services '
- [x] College of Liberal Arts & Sciences '
- [ ] Graduate School
- [ ] Honors College
- [ ] University College

(A4) Curriculog Type*
- (•) Program
- ( ) Shared Core

(A5) Program Level* (New Graduate Program - Request to Establish)

Changes to courses and curricula often have impacts both within the proposing department as well as campus-wide. What effect will this proposal have on existing courses and curricula and other departments/units at UNC Charlotte? Answer the following questions to address how you have assessed potential impacts and what the impacts of this proposal might be.

(A6) Please list any closely related, existing programs at UNC Charlotte, if applicable. none

(A7.a) Does the proposed program impact other units, departments or colleges?*

- ○ Yes
- ◉ No

(A7.b Help) If Yes, please list the units and paste consultations with those units in the consultations field below or attach using Files in toolbox at right.

(A7.b) Consultations - List impacted units and paste consultations here or attach.

none

(A8.a) NEW COURSES - Total number of new courses that were created for this program:*

9

(A8.b Help) For each new course submit a "New Course" proposal (Curriculog forms). List the new courses in the following field with hyperlinks to each proposal's URL.

(A8.b) NEW COURSES - List each new course and provide hyperlink to each proposal URL

DTSC 8110 - Statistics for Data Science - https://charlotte.curriculog.com/proposal:9777/form

DTSC 8120 - Fundamentals of Machine Learning - https://charlotte.curriculog.com/proposal:9766/form

DTSC 8130 - Ethics, Security, Privacy, & Governance of Data for Social Good - https://charlotte.curriculog.com/proposal:9767/form

DTSC 8150 - Fundamentals of AI - https://charlotte.curriculog.com/proposal:9773/form

DTSC 8000 - Special Topics in Data Science - https://charlotte.curriculog.com/proposal:9751/form

DTSC 8600 - Research Design for Data Science - https://charlotte.curriculog.com/proposal:9756/form

DTSC 8601 - Data Science Research Seminar - https://charlotte.curriculog.com/proposal:9755/form

DTSC 8800 - Independent Study in Data Science - https://charlotte.curriculog.com/proposal:9752/form

DTSC 8900 - Dissertation Research - https://charlotte.curriculog.com/proposal:9754/form

(A9.a) Delivery Method, check all that apply:*

- ☐ Yes, 50% or more of the program will be offered online or in a blended format
- ☐ Yes, one or more courses in the program will be offered at an off-campus location (other than Dubois Center at UNC Charlotte Center City)
- ☑ Neither

(A9.b) If Yes, please additionally complete "Supplemental Form - Distance Education Programs" (Curriculog forms).

(A10 Help) Creation of a new major requires that the originator propose a CIP code that is appropriate based on the content of the program. Link for CIP Codes

(A10) CIP Code

11.0701

(A11) Proposed Major Code

Computer Science

(A12) Completed Request for Preliminary Authorization (please include hyperlinked URL to the Request for Preliminary Authorization Proposal)

https://provost.charlotte.edu/sites/provost.charlotte.edu/files/media/Request%20for%20Preliminary%20Authorization%20PhD%20Data%20Science%20Ap%

(A13.a) ATTACHMENTS: Using Files in toolbox at right, please attach the corresponding documents to this proposal:

Request to Establish a New Degree Program,
Student Learning Outcomes Assessment Plan,
UNC System Academic Program Planning Financial Worksheet, and
Substantive Change Planning Questionnaire.

(A13.b) Indicate what you have attached/included:*

- ☑ Unit Consultations and/or Letters of Support
- ☐ Student Learning Outcomes Assessment Plan
- ☑ Request for Preliminary Authorization
- ☑ Request to Establish a New Degree Program
- ☑ Substantive Change Planning Questionnaire
- ☑ UNC System Academic Program Planning Financial Worksheet
- ☑ Other

Section B: Program Content for Catalog and DegreeWorks

Complete the fields in this section to build the program: program title, program description, admissions requirements, and program curriculum. For specifics on expected program format, please refer to ...

'Program Layout' and 'Program Template' examples on the Resources webpage
Programs within the Catalog
Training Doc: How to Use an Existing Program as a Template

(B1) Program Title* Data Science, Ph.D.

(B2) Program Description* The Ph.D. in Data Science (DTSC) is transdisciplinary by design and lays emphasis on the mastery of the data science tools and methodologies and on responsible stewardship of data to cover the broad value of data science in various domains across society. Strong emphasis is placed on providing students the opportunity to demonstrate mastery of knowledge in multiple data science application domains.
The program provides research intensive doctoral-level education for students seeking Data Science careers in practice, research and teaching/academia. It is intended to produce researchers fluent in the emerging field of data science and to develop an environment for their education and training. The objectives of the Data Science Ph.D. include:
• Preparing research data scientists, professional data scientists, and scholars/academicians who will be leaders in developing, maintaining, and managing data ethically and effectually to sustain the economic and social vibrancy of North Carolina and the United States;
• Developing research data scientists who have a deep understanding of data, statistics, computing, and ethics frameworks such that they can build new knowledge across fields and society by appropriate data collection, methods development, and deep analysis;
• Providing a range of educational and research experiences for a diverse group of students to participate in research initiatives at UNC Charlotte, Private, Public, and International institutions; and,
• Preparing future data science educators, and scholars, who are at the frontiers of understanding and disseminating data science knowledge.

(B3) Admissions Requirements* The DTSC Ph.D. program seeks the following from successful applicants to the program:

- The equivalent to a U.S. baccalaureate and a Master's degree from a college or university accredited by an accepted accrediting body with a minimum undergraduate GPA of 3.20 and a minimum graduate GPA of 3.50 (on a 4.00 scale) in all graduate work. Outstanding applicants holding a baccalaureate degree with an undergraduate GPA of 3.75 or above may also be considered for admission.
- A satisfactory score (>50th percentile) from the aptitude portion of the GRE (optional).
- An acceptable TOEFL or IELTS score as required by UNC Charlotte for international students from select foreign countries. In addition, TOEFL iBT must be a minimum score of 18 on each section of the test while the IELTS must be a minimum score of 6.5 in each section.
- Any other appropriate credentials as required by the Graduate School.

Applicants with the equivalent to a Master's degree from a college or university accredited by an accepted accrediting body, in data science or in a related field with a minimum undergraduate GPA of 3.20 and a minimum graduate GPA of 3.50 (on a 4.00 scale) in all graduate work are eligible to apply for the Advanced Standing (see Degree Requirements for details).

Students can be admitted to the program on a part-time basis, including under the Advanced Standing option.

(B4 Help) The following 'Degree Requirements and Curriculum' field has 3 tabs: View Curriculum Courses, View Curriculum Schema, and Preview Curriculum

Select 'View Curriculum Courses' to add and remove courses the program may use. Use the 'Import Course' button to add existing courses from the catalog. Use the 'Add Course' button to manually enter the prefix, number and title of a newly proposed course that is not yet in the Catalog. Training Video: How to Add Courses to Program
Select 'View Curriculum Schema' to format the requirements exactly as they should appear in the catalog. Choose 'Add Core' to create a section of the curriculum. Cores/sections can contain text, course lists, or both. For specifics on expected program format, refer to 'Program Layout' and 'Program Template' examples on the Resources webpage or to programs within the Catalog.
Select Preview Curriculum to preview the full curriculum.

(B4) Degree Requirements and Curriculum*

Advanced Standing option

Students admitted to the Avanced Standing option of the program must complete 36 credit hours of core requirements (18 credits of course work and 18 credits of Dissertation Research - DTSC 8900) and 6 credit hours of electives with the approval of their advisor and of the DTSC Program Director. In addition, students must take GRAD 8302 (Responsible Conduct of Research) and GRAD 8990 (Academic Integrity).

There is no restricted list of electives.

DTSC 8601 Data Science Research Seminar	
DTSC 8110 Statistics for Data Science	
DTSC 8120 Fundamentals of Machine Learning	
DTSC 8130 Ethics, Security, & Governance of Data for Social Good	
DTSC 8150 Fundamentals of AI	
DTSC 8600 Research Design in Data Science	
DTSC 8900 Dissertation Research	
GRAD 8302 Responsible Conduct of Research	**2**
GRAD 8990 Academic Integrity	**0**
[After] DTSC 8601 must be repeated four time.	**4 x 1**

Standard Standing option

Students admitted to the Standard Standing option of the program must complete 36 credit hours of core requirements (18 credits of course work and 18 credits of Dissertation Research - DTSC 8900) and 36 credit hours of electives with the approval of their advisor and of the DTSC Program Director. In addition, students must take GRAD 8302 (Responsible Conduct of Research) and GRAD 8990 (Academic Integrity).

There is no restricted list of electives.

DTSC 8601 Data Science Research Seminar	
DTSC 8110 Statistics for Data Science	
DTSC 8120 Fundamentals of Machine Learning	
DTSC 8130 Ethics, Security, & Governance of Data for Social Good	
DTSC 8150 Fundamentals of AI	
DTSC 8600 Research Design in Data Science	
DTSC 8800 Independent Study in Data Science	
DTSC 8900 Dissertation Research	
GRAD 8302 Responsible Conduct of Research	**2**
GRAD 8990 Academic Integrity	**0**
[After] DTSC 8601 must be repeated four time.	**4 x 1**

(B5) Other Requirements (Optional)

English language proficiency is required. The DTSC Ph.D. will conform to the established UNC Charlotte Graduate Admissions English Language Proficiency Requirements and Policies:

https://gradadmissions.uncc.edu/admissions-info/doctoral/ and

https://gradadmissions.charlotte.edu/admissions/international-applicants/english-language-proficiency. These include official and satisfactory English language proficiency scores on the

Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS). A minimum score of 83 on the Internet-based TOEFL or a minimum overall band score of 6.5 on the IELTS are required for admission to the doctoral program.

As per UNC Charlotte Graduate Admissions policy, “Applicants who do not meet the minimum English language proficiency requirement will not be admitted to UNC Charlotte. They may, however, choose to enroll at UNC Charlotte’s English Language Training Institute (ELTI) and then re-apply to the Graduate School. See ELTI’s website: www.ielts.org for details.

Credit Transfers/:

Students applying for admission in the Advanced Standing option of the DTSC Program, and admitted to it, cannot transfer course credit hours.

Within the established policies and protocols of the UNC Charlotte Graduate School, students not in the Advanced Standing option of the DTSC Program may be allowed to transfer up to 9 semester hours of graduate credit (coursework only) earned at UNC Charlotte or other recognized graduate programs, if they are deemed relevant to their study in the DTSC Ph.D. Program.

While enrolled in the DTSC Ph.D. Program, students may take courses from the DSBA Master’s (6000/7000-level) at UNC Charlotte and have them transferred as credit towards the DTSC Ph.D. Program. These credits cannot be counted towards the requirements of another degree program. Transfers are subject to the approval of the Graduate School, Program Director and student’s academic advisor.

(B6) Grade Requirements* Grades of A or B are acceptable, while grades of C or U are marginal and unacceptable, respectively. Per policies of the UNC Charlotte Graduate School, an accumulation of two "C" grades or one "U" grade will result in termination of enrollment from the DTSC Ph.D. program. DTSC Ph.D. students suspended or terminated from the doctoral program may appeal once to the Program Director to be reinstated by submitting an acceptable plan to improve their grades and successfully complete the program.

(B7) Total number of credit hours for the program:* 72 (42 credit hours for students with advanced standing)

Section C: Launch

Note: Your answers in Section A dictate the workflow steps. Launching the proposal will lock-in the workflow. To review the workflow first, Save All Changes (within the sticky toolbar below), then click Steps to Approval in toolbox at right.

STEP 2 STEP 2 - Launch the Proposal

(C1) Validate and Launch the proposal using Launch at top of form or within the sticky toolbar below.

Section D: Approve

STEP 3 STEP 3 - Approve the Proposal

(D1) Approve the proposal to send it onto the next step in the workflow. Use Decisions in toolbox at right.

Section E: Library Holdings Evaluation

This section is to be completed by the Subject Librarian

Training Doc: How Subject Librarians enter library holdings evaluation

(E1) Librarian's Evaluation of Holdings:

- ○ Holdings are superior
- ◉ Holdings are adequate
- ○ Holdings are adequate only if department purchases additional items
- ○ Holdings are inadequate

(E2) Librarian's Comments:

Since the offering of the DSBA (Masters of Data Science and Business Analyst) and HIA (Master's in Health Informatics and Analytics) degrees, the UNC Charlotte Atkins Library has continued to provide resources and materials to support these programs. With the recent addition of the Bachelor of Data Science, a materials budget has been provided to the School of Data Science as well as continued funding from the Colleges of Business, Health and Human Services, and Computing and Informatics budgets due to the multidisciplinary nature of the Data Science programs. Based on an analysis of the Data Science/Research Data Librarian, Reese Manceaux, the current holdings are satisfactory to support research and instruction for this program and its faculty and students.

Students have access to hundreds of thousands of physical books and e-books from Springer, Wiley, Elsevier, Cambridge, Business Expert Press Digital Library and other publishers. Also available are the latest scholarly articles from databases such as Web of Science, ScienceDirect, Business Source Complete, ACM, Compendex, INSPEC, and others.

For this assessment, selected US institutions with doctoral programs in Data Science were used to evaluate the resources of the library and compare them with the University of North Carolina at Charlotte. They include Worcester Polytechnic Institute, Carnegie Mellon University, University of Virginia, UT-Austin, and Kennesaw State.

Databases of journal articles that Atkins Library currently subscribes to and are very important to the collections are below. These are mostly held by the other institutions as well:

- For Engineering/Statistics/Mathematics: Web of Science, ScienceDirect, ACM Digital Library, Compendex, INSPEC, IEEE Xplore, MathSciNet
- For Business: ABI-INFORM, Business Source Complete, Mergent Online, Mintel Academic Reports
- For Health: PubMed, Cochrane Library, CINAHL Complete, Liebert Online
- For Social Science, Humanities, and General Data/Statistics/Demographics: SimplyAnalytics, Data Axle, Proquest Statistical Abstract, Statista, Data Citation Index, Policy Map

Databases that other universities with Ph.D. Data Science programs have that Atkins current does not subscribe to but would greatly benefit the Data Science program 4 years or more into the future would be :

- For Engineering, Mathematics, and Health: Scopus which is the largest abstract and citation database of peer-reviewed literature.
- For Social Science, Humanities, and General Data/Statistics/Demographics: Data Planet/SAGEData (Access data on economics, crime, health, population, energy, the environment, and more in a single interface), Social Explorer (contains access to U.S. Census data dating back to 1790. Users can create maps and embed them as objects or download static images), Proquest Historical Statistical Abstract Add-on (back to 1878) and Abstracts of the World (50 countries worth of data).

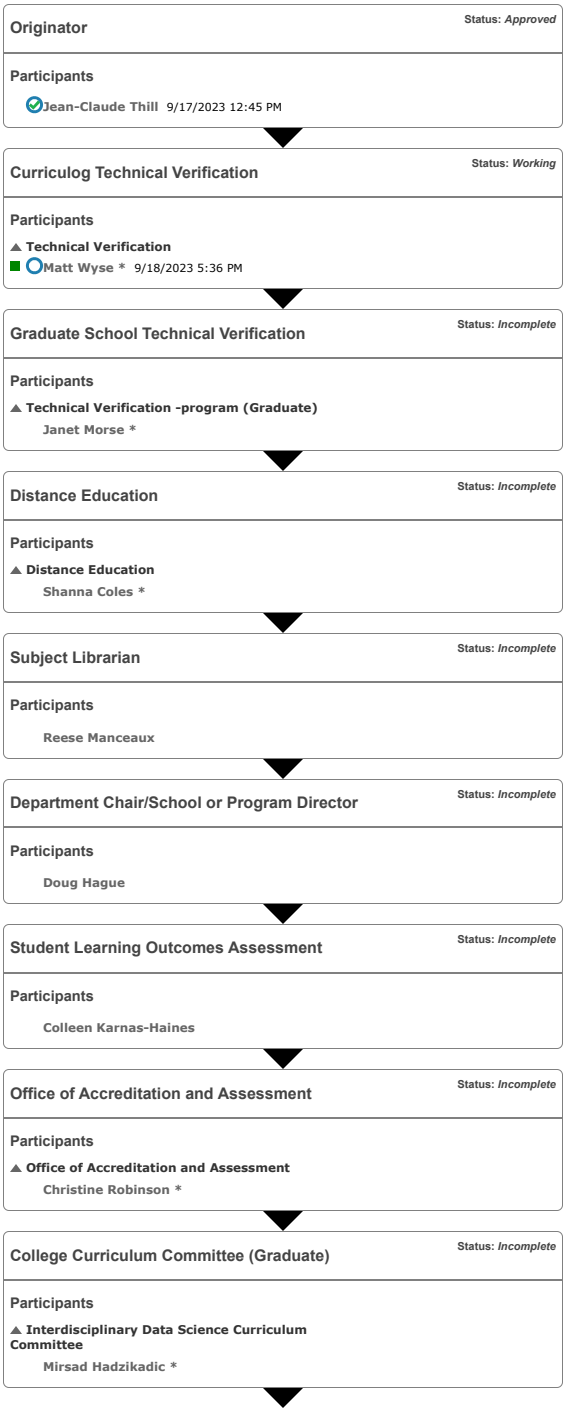
DATA SETS: Atkins Library currently does not have the budget to purchase data sets which would aid research. These are quite varied depending on the topic of the researcher. A library fund for the purchase of these datasets would be helpful to purchase these on an as-needed basis. Also of use would be Text and Data Mining Collections that include:

- Proquest TDM Studio (ability to mine large volumes of published content from millions of pages of news and scholarly publications), Proquest Historical Newspapers and Congressional Record Text-as-Data Collection, and English-Corpora Text as Data.
- OR Nexis Daas (Data as a Service) to mine Nexis content

For an expanded selection of e-books, a subscription to the O'Reilly Safari Technical Books (a computer science focus) would be a helpful addition to our collection because of the wide variety of programming language, computer science, business analytics type books that the publisher prints.

End of Proposal

Steps for Data Science, Ph.D. - (New Graduate Program - Request to Establish)



College Faculty Chair or President

Status: *Incomplete*

Participants

Monica Johar

College Dean

Status: *Incomplete*

Participants

▲ **Interdisciplinary Data Science Board**

Doug Hague *

Graduate Council

Status: *Incomplete*

Participants

▲ **Graduate Council**

Annette Parks *

Faculty President

Status: *Incomplete*

Participants

Xiaoxia Newton

CFO Vice Chancellor for Business Affairs

Status: *Incomplete*

Participants

Richard Amon

Provost

Status: *Incomplete*

Participants

Leslie Zenk

Faculty Council Consent Calendar

Status: *Incomplete*

Participants

▲ **Faculty Council Consent Calendar**

Matt Wyse *

UNC System

Status: *Incomplete*

Participants

Leslie Zenk

SACSCOC

Status: *Incomplete*

Participants

▲ **Office of Accreditation and Assessment**

Christine Robinson *

U.S. Department of Education

Status: *Incomplete*

Participants

Bruce Blackmon

Curriculog Administrator

Status: *Incomplete*

Participants

Matt Wyse

Banner

Status: *Incomplete*

Participants

▲ **Banner Team**

TechProcess-REG Account *

Graduate Admissions

Status: *Incomplete*

Participants

▲ **Graduate Admissions**

Kathy Giddings *

Catalog Editor

Status: *Incomplete*

Participants

PJ Frick

DegreeWorks (Graduate)

Status: *Incomplete*

Participants

▲ **DegreeWorks (Graduate) Team**

Janet Morse *

Attachments for Data Science, Ph.D. - (New Graduate Program - Request to Establish)

PhD Data Science-Substantive Change Questionaire.pdf (uploaded by Jean-Claude Thill, 9/14/2023 3:08 pm) **Attachment I.pdf** (uploaded by Jean-Claude Thill, 9/14/2023 3:11 pm) **Attachment II.pdf** (uploaded by Jean-Claude Thill, 9/14/2023 3:11 pm) **Attachment IV.pdf** (uploaded by Jean-Claude Thill, 9/14/2023 3:11 pm) **Attachment V.pdf** (uploaded by Jean-Claude Thill, 9/14/2023 3:12 pm) **Attachment III.pdf** (uploaded by Jean-Claude Thill, 9/17/2023 12:39 pm) **PhD Data Science request-to-establish NewV 30 9-17-2023.pdf** (uploaded by Jean-Claude Thill, 9/17/2023 12:40 pm)