To Whom It May Concern:

Proposal: Change the name of the degree currently named Discovery Informatics to Data Science. Change the associated program acronym from DISC to DATA. DATA will be the new course acronym for DISC 101, 210, and 495.

Associated Curriculum Changes: None

Background: Discovery Informatics is an interdisciplinary program between the Mathematics and Computer Science Departments. When the program was originally created it was unique, and so it was difficult to predict the best name for the program, and while it remains a very unique offering at the undergraduate level, academia and industry have not adopted this name.

Motivation: After discussion among faculty in the Mathematics and Computer Science Departments, we believe that a name has emerged that accurately describes the program and one that is accepted by the community\(^1,2,3\). We would like to change the name of the program to Data Science, while leaving the curriculum unchanged. Writings are now found about Data Science in peer-reviewed literature, the mass media, and from industry leaders such as Tim Berners-Lee (inventor of the Web and director of the W3C). Even local companies are using it, such as Modus21 in Mount Pleasant. Additionally, Chris Starr recently interviewed nine software companies in Silicon Valley in June 2012, confirming their preference for the name Data Science. The majority of these companies employ and will continue to seek new employees with the skillset provided by our program. Data science has emerged as the name of the discipline addressing knowledge discovery in datasets on which we base our program.

Impact: Leaving the name as Discovery Informatics has a significant negative impact on our current students, while also making it difficult to recruit future students. Perspective students are unable to find information about Discovery Informatics from major and alternative sources (magazines, articles, etc). The current name also makes it difficult for our students to market themselves for job openings and internships, which are advertised as data science openings.

Survey results from current students: An anonymous survey was conducted to solicit student feedback on the name change, and over 90% of the responding students indicated Data Science as the preferred name.

\(^1\) [http://blog.revolutionanalytics.com/2011/09/data-science-a-literature-review.html]
\(^2\) [http://radar.oreilly.com/2010/06/what-is-data-science.html]
Discovery Informatics Program Director

Chair of Computer Science

Chair of Mathematics

Dean

Associate Provost

Requires Notification of Several Offices
FACULTY CURRICULUM COMMITTEE COURSE FORM

Contact Name: Anderson    Email: andersonpe2@cofc.edu    Phone: 8151
Department or Program Name: Discovery Informatics School name: SSM
Course Prefix, Number, and Title: DISC 210 - Dataset Organization and Management changing to DATA 210

I. CATEGORY OF REVIEW (Check all that apply)
(Note: For changes to course, if you check more than two separate changes, you must create a new course.)

NEW COURSE

☐ New Course (attach syllabus)

CHANGE COURSE

☐ Change Number  ☐ Change Title
☐ Change Credits/Contact hours  ☐ Prerequisite Change
☐ Edit Description  ☐ Change acronym

DELETE COURSE

☐ Re-activate Course  ☐ Delete Course

☐ Approve for Cross-listing (attach rationale and written permission from relevant department)

☐ Intended to fulfill a General Education requirement (new courses only). If this box is checked, the course must also be submitted for review by the General Education Committee using this form.

Date (Semester/Year) the course will first be offered: Fall 2013

What are the prerequisites AND OTHER RESTRICTIONS (e.g., class level, major, co-requisite, credit for a mutually exclusive course)?

None

Will this course be added to the Degree Requirements of a Major, Minor, Concentration or List of Approved Electives?

a) ☐ Yes  ☑ No

b) If yes, complete and attach the CHANGE DEGREE REQUIREMENT form(s) for each affected program. List the name(s) of each program affected below:

It is already a degree requirement. We are only changing the acronym, title, and description to correspond to the new name of the program previously known as Discovery Informatics.

II. NUMBER OF CREDITS and CONTACT HOURS per week

A. Contact Hours

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<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B. Credit Hours 3

Is this course repeatable? ☐ yes ☑ no  If so, how many credit hours may the student earn in this course?
III. CATALOG DESCRIPTION  Limit to 50 words EXACTLY as you want it to appear in the catalog; include prerequisites, co-requisites, and other restrictions.

A course to introduce the structure of databases and the management of datasets for information extraction. Concepts include the relational and entity relationship models, and local and distributed storage and access. The preparation and management of datasets for analysis is covered, and includes data cleaning, reorganization and security.

IV. RATIONALE or JUSTIFICATION: If course change or deletion—please provide reasons for change(s) to or deletion of a course. If a new course—briefly address the goals/objectives for the course, how the course supports a major or minor program, etc. For non-major courses address how the course supports the liberal arts tradition and the mission of the institution.

This acronym and description change is necessary because the name of the degree, Discovery Informatics, is being changed to Data Science.

V. STUDENT LEARNING OUTCOMES and ASSESSMENT

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<th>Student Learning Outcomes</th>
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<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
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<td>1. To distinguish between traditional relational databases, NoSQL databases, the semantic web, and data warehouses</td>
<td>Through several exams and/or quizzes. Standard grading assessment.</td>
</tr>
<tr>
<td>2. To use a local relational databases to store, query, and aggregate information</td>
<td>Through several exams and/or quizzes. Standard grading assessment.</td>
</tr>
<tr>
<td>3. To design entity relationship diagrams</td>
<td>Through several exams and/or quizzes. Standard grading assessment.</td>
</tr>
<tr>
<td>4. To apply, data cleaning methodologies, reorganization schemes for relational databases, data security techniques on distributed and local systems</td>
<td>Through several exams and/or quizzes. Standard grading assessment.</td>
</tr>
<tr>
<td>5. To apply semantic web technologies, such as resource description framework (RDF) and the</td>
<td>Through several exams and/or quizzes. Standard grading assessment.</td>
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query language SPARQL.
To learn how to store and transmit data in industry standard formats, such as JavaScript Object Notation (JSON) and XML.

Through several exams and/or quizzes. Standard grading assessment.

How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

This course provides important underlying content and skills to organize and manage information in data science applications. The content and skills are introduced and demonstrated.

VII. IMPACT ON EXISTING PROGRAMS and COURSES: Please briefly document the impact of this new/changed/deleted course on other programs and courses; if deleting a course—list all programs that include the course; if adding/changing a course—explain any overlap with existing courses in the same or different departments.

None

VIII. COSTS ASSOCIATED WITH THE ACTION REQUESTED: List all of the new costs or cost savings, (including new faculty/staff requests, library or equipment, etc.) associated with the action requested.

None

IX. APPROVAL AND SIGNATURES

1. Signature of Department Chair or Program Director:

   [Signature]

   Date: 11-6-12

2. Signature of Academic Dean:

   [Signature]

   Date: 11/28/12

3. Signature of Provost:
4. Signature of Curriculum Committee Chair:

______________________________ Date: ____________________

5. Signature of Faculty Senate Secretary:

______________________________ Date: ____________________

Date Approved by Faculty Senate: ____________________

Following Senate approval, the Faculty Senate Secretary will forward the entire packet to the Registrar.
FACULTY CURRICULUM COMMITTEE COURSE FORM

Contact Name: Anderson	Email: andersonpe2@cofc.edu	Phone: 8151
Department or Program Name: Discovery Informatics School name: SSM

Course Prefix, Number, and Title: DISC 101 - Introduction to Discovery Informatics changing to DATA 101 - Introduction to Data Science

I. CATEGORY OF REVIEW (Check all that apply)
(Note: For changes to course, if you check more than two separate changes, you must create a new course.)

NEW COURSE

☐ New Course (attach syllabus)

CHANGE COURSE

☐ Change Number
☒ Change Title
☐ Change Credits/Contact hours
☐ Prerequisite Change
☒ Edit Description
☒ Change acronym

DELETE COURSE

☐ Re-activate Course
☐ Delete Course

☐ Approve for Cross-listing (attach rationale and written permission from relevant department)

☐ Intended to fulfill a General Education requirement (new courses only). If this box is checked, the course must also be submitted for review by the General Education Committee using this form.

Date (Semester/Year) the course will first be offered: Fall 2013

What are the prerequisites AND OTHER RESTRICTIONS (e.g., class level, major, co-requisite, credit for a mutually exclusive course)?

None

Will this course be added to the Degree Requirements of a Major, Minor, Concentration or List of Approved Electives?

a) ☐ Yes  ☒ No

b) If yes, complete and attach the CHANGE DEGREE REQUIREMENT form(s) for each affected program. List the name(s) of each program affected below:

It is already a degree requirement. We are only changing the acronym, title, and description to correspond to the new name of the program previously known as Discovery Informatics.

II. NUMBER OF CREDITS and CONTACT HOURS per week

A. Contact Hours

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B. Credit Hours 3
Is this course repeatable? □ yes ☐ no  If so, how many credit hours may the student earn in this course?

III. CATALOG DESCRIPTION Limit to 50 words EXACTLY as you want it to appear in the catalog; include prerequisites, co-requisites, and other restrictions.

Introduction to knowledge discovery techniques, emphasizing computer based tools for the analysis of large data sets. Topics include the data science process and inductive data-driven modeling. Students will have hands-on experience with statistical inference and data mining software and complete a project.

IV. RATIONALE or JUSTIFICATION: If course change or deletion—please provide reasons for change(s) to or deletion of a course. If a new course—briefly address the goals/objectives for the course, how the course supports a major or minor program, etc. For non-major courses address how the course supports the liberal arts tradition and the mission of the institution.

This acronym and description change is necessary because the name of the degree, Discovery Informatics, is being changed to Data Science.

V. STUDENT LEARNING OUTCOMES and ASSESSMENT

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<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1. To gain an overview the field of knowledge discovery</td>
<td>Through several exams and/or quizzes. Standard grading assessment.</td>
</tr>
<tr>
<td>2. To obtain an introductory understanding of the following data-centric concepts: relational databases, cloud storage, cloud computing (e.g., map-reduce), and NoSQL databases</td>
<td>Through several exams and/or quizzes. Standard grading assessment.</td>
</tr>
<tr>
<td>3. To obtain an introductory understanding of the fields of data mining, machine learning, and AI that includes an introduction to algorithms such as naïve Bayes classifier, neural networks, principal component analysis, PLS regression, decision trees, k-means clustering, hierarchical clustering, hidden</td>
<td>Through several exams and/or quizzes. Standard grading assessment.</td>
</tr>
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<td>Markov models, inductive reasoning, deductive reasoning, etc.</td>
<td>Through several exams and/or quizzes. Standard grading assessment.</td>
</tr>
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<td>------------------------------------------------------------------</td>
</tr>
<tr>
<td>4. To understand the social, ethical, and legal issues of informatics and data science.</td>
<td>Through one or more oral presentations describing the results of their project, written status project reports, and written final project report. Standard grading assessment.</td>
</tr>
</tbody>
</table>

How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

This course provides a general introduction into the field of data science, and therefore, it aligns with the overall educational objectives of the program. The content and skills are introduced and demonstrated.

**VII. IMPACT ON EXISTING PROGRAMS and COURSES:** Please briefly document the impact of this new/changed/deleted course on other programs and courses; if deleting a course—list all programs that include the course; if adding/changing a course—explain any overlap with existing courses in the same or different departments.

None

**VIII. COSTS ASSOCIATED WITH THE ACTION REQUESTED:** List all of the new costs or cost savings, (including new faculty/staff requests, library or equipment, etc.) associated with the action requested.

None

**IX. APPROVAL AND SIGNATURES**

1. Signature of Department Chair or Program Director:

   [Signature]

   Date: **11-6-12**

2. Signature of Academic Dean:
3. Signature of Provost: ___________________________ Date: 11/18/12

4. Signature of Curriculum Committee Chair: ___________________________ Date: 1/14/13

5. Signature of Faculty Senate Secretary: ___________________________ Date: ____________

Date Approved by Faculty Senate: ___________________________

Following Senate approval, the Faculty Senate Secretary will forward the entire packet to the Registrar.
FACULTY CURRICULUM COMMITTEE COURSE FORM

Contact Name: Anderson    Email: andersonpe2@cofc.edu    Phone: 8151
Department or Program Name: Discovery Informatics    School name: SSM

Course Prefix, Number, and Title: DISC 495 - Discovery Informatics Capstone changing to DATA 495 - Data Science Capstone

I. CATEGORY OF REVIEW (Check all that apply)
(Note: For changes to course, if you check more than two separate changes, you must create a new course.)

NEW COURSE

☐ New Course (attach syllabus)

CHANGE COURSE

☐ Change Number
☐ Change Title
☐ Change Credits/Contact hours
☐ Prerequisite Change
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DELETE COURSE

☐ Re-activate Course
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☐ Approve for Cross-listing (attach rationale and written permission from relevant department)

☐ Intended to fulfill a General Education requirement (new courses only). If this box is checked, the course must also be submitted for review by the General Education Committee using this form.

Date (Semester/Year) the course will first be offered: Fall 2013

What are the prerequisites AND OTHER RESTRICTIONS (e.g., class level, major, co-requisite, credit for a mutually exclusive course)?

None

Will this course be added to the Degree Requirements of a Major, Minor, Concentration or List of Approved Electives?

a) ☐ Yes    ☒ No

b) If yes, complete and attach the CHANGE DEGREE REQUIREMENT form(s) for each affected program. List the name(s) of each program affected below:

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B. Credit Hours

3
III. CATALOG DESCRIPTION Limit to 50 words EXACTLY as you want it to appear in the catalog; include prerequisites, co-requisites, and other restrictions.

A capstone course for the application of knowledge discovery and data mining tools and techniques to large data repositories or data streams. This project based course provides students with a framework in which students gain both understanding and insight into the application of knowledge discovery tools and principles on data within the student's cognate area. This course is intended only for data science majors.

Prerequisites: DISC 210, CSCI 470, and MATH 441.

IV. RATIONALE or JUSTIFICATION: If course change or deletion—please provide reasons for change(s) to or deletion of a course. If a new course—briefly address the goals/objectives for the course, how the course supports a major or minor program, etc. For non-major courses address how the course supports the liberal arts tradition and the mission of the institution.

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<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1. Implement, develop, and investigate a novel problem in the field of data science related to the cognate area of the student.</td>
<td>The student is responsible for a final project report that describes there methods and results. For the majority of projects, software artifacts will also be created and assessed.</td>
</tr>
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How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

This course represents the capstone experience in data science, where students will apply the techniques learned throughout the curriculum in a semester long project based course.

VII. IMPACT ON EXISTING PROGRAMS and COURSES: Please briefly document the impact of this new/changed/deleted course on other programs and courses; if deleting a course—list all programs that
include the course; if adding/changing a course—explain any overlap with existing courses in the same or different departments.

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None

IX. APPROVAL AND SIGNATURES

1. Signature of Department Chair or Program Director:

   [Signature]

   Date: 11-6-12

2. Signature of Academic Dean:

   [Signature]

   Date: 11/28/12

3. Signature of Provost:

   [Signature]

   Date:

4. Signature of Curriculum Committee Chair:

   [Signature]

   Date:

5. Signature of Faculty Senate Secretary:

   [Signature]

   Date:

Date Approved by Faculty Senate:

Following Senate approval, the Faculty Senate Secretary will forward the entire packet to the Registrar.
FACULTY CURRICULUM COMMITTEE COURSE FORM

Contact Name: Anderson   Email: andersonpe2@cofc.edu   Phone: 8151
Department or Program Name: Discovery Informatics   School name: SSM

Course Prefix, Number, and Title: DISC 495 - Research Experience in Discovery Informatics changing to DATA 397 - Research Experience in Data Science

I. CATEGORY OF REVIEW (Check all that apply)
(Note: For changes to course, if you check more than two separate changes, you must create a new course.)

NEW COURSE
☐ New Course (attach syllabus)

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Date (Semester/Year) the course will first be offered: Fall 2013

What are the prerequisites AND OTHER RESTRICTIONS (e.g., class level, major, co-requisite, credit for a mutually exclusive course)?

None

Will this course be added to the Degree Requirements of a Major, Minor, Concentration or List of Approved Electives?

a) ☐ Yes   ☒ No

b) If yes, complete and attach the CHANGE DEGREE REQUIREMENT form(s) for each affected program. List the name(s) of each program affected below:

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<tr>
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B. Credit Hours

0
III. CATALOG DESCRIPTION  Limit to 50 words EXACTLY as you want it to appear in the catalog; include prerequisites, co-requisites, and other restrictions.

A student works under faculty supervision to learn a research method, to explore possible research topics, or to continue an ongoing study. The faculty member helps the student to determine the course goals and objectives, and supervises the execution of the project. The student will provide a written report to the faculty at the end of the semester. Students will receive a grade of "S" (satisfactory) or "U" (unsatisfactory) for the course.

Prerequisites: Only majors may take a Zero Credit Research course. Permission of the instructor and approval of the department chair.

IV. RATIONALE or JUSTIFICATION: If course change or deletion—please provide reasons for change(s) to or deletion of a course. If a new course—briefly address the goals/objectives for the course, how the course supports a major or minor program, etc. For non-major courses address how the course supports the liberal arts tradition and the mission of the institution.

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<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1. Gain experience in the field of data science by participating in a new or ongoing research project.</td>
<td>The student is responsible for a final project report that describes their methods and results. For the majority of projects, software artifacts will also be created and assessed.</td>
</tr>
</tbody>
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How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

This course represents the capstone experience in data science, where students will apply the techniques learned throughout the curriculum in a semester long project based course.
VII. IMPACT ON EXISTING PROGRAMS and COURSES: Please briefly document the impact of this new/changed/deleted course on other programs and courses; if deleting a course—list all programs that include the course; if adding/changing a course—explain any overlap with existing courses in the same or different departments.

None

VIII. COSTS ASSOCIATED WITH THE ACTION REQUESTED: List all of the new costs or cost savings, (including new faculty/staff requests, library or equipment, etc.) associated with the action requested.

None

IX. APPROVAL AND SIGNATURES

1. Signature of Department Chair or Program Director:
   [Signature]
   Date: 1/15/12

2. Signature of Academic Dean:
   [Signature]
   Date: 11/28/12

3. Signature of Provost:
   [Signature]
   Date: 1/14/13

4. Signature of Curriculum Committee Chair:

   Date: __________________________

5. Signature of Faculty Senate Secretary:

   Date: __________________________

Date Approved by Faculty Senate: __________________________

Following Senate approval, the Faculty Senate Secretary will forward the entire packet to the Registrar.