August 13, 2021

Last summer, the Computing Accreditation Commission (CAC) and Computing Area Delegation (CAD) of ABET approved criteria for accrediting undergraduate data science programs under CAC. These were developed by a subcommittee of the CSAB-CAC Joint Criteria Committee, and were posted publicly for a review and comment period last fall.

Since that time, members of this subcommittee, along with others from CSAB, its new member the American Statistical Association, and the Applied and Natural Sciences Accreditation Commission (ANSAC) of ABET, have been working on developing similar criteria for accreditation of data science programs under ANSAC.

Based on input received during the public review period for the CAC version and a desire to align (as appropriate) the two sets of criteria, the CAC criteria were modified and resubmitted to the commission in July. At the same time, CSAB submitted to ANSAC the newly developed criteria for accrediting data science programs within that commission. Both sets of criteria were approved by their respective commissions last month. Next, they will go to relevant ABET Area Delegations, which meet in October.

This document contains the criteria approved by the Computing Accreditation Commission.

WITHOUT MARK UP

PROGRAM CRITERIA FOR DATA SCIENCE, DATA ANALYTICS, AND SIMILARLY NAMED COMPUTING PROGRAMS

2nd Reading

Lead Interim Society: CSAB

These program criteria apply to computing programs using data science, data analytics or similar terms in their titles.

Criterion 3. Student Outcomes

In addition to outcomes 1 through 5, graduates of the program will also have an ability to:

6. Apply theory, techniques, and tools throughout the data science lifecycle and employ the resulting knowledge to satisfy stakeholders' needs. [DS]

Criterion 5. Curriculum

The curriculum requirements are in addition to the General Criteria curriculum requirements and specify topics, but do not prescribe specific courses.

These requirements are:

At least 45 semester credit hours (or equivalent) of data science course work that must cover:

1. Fundamental data science lifecycle topics:

    a) Data acquisition and representativeness
    b) Data management
    c) Data preparation and integration
    d) Data analysis
    e) Model development and deployment
    f) Visualization and communication of the knowledge obtained from the data

2. Concepts that span and are applied to the data science lifecycle:

    a) Data ethics including legitimate use and algorithmic fairness
    b) Governance including privacy, security, and stewardship
    c) Statistical and mathematical topics including inference, modeling, linear algebra, probability, and optimization
    d) Computing including data structures and algorithms

3. Advanced data science coursework that provides depth.

4. Coverage of at least one application area to provide a context for data science activities.

5. A major project that incorporates an application area and requires integration and application of knowledge and skills acquired in earlier course work.

WITH MARK UP

PROGRAM CRITERIA FOR DATA SCIENCE, DATA ANALYTICS, AND SIMILARLY NAMED COMPUTING PROGRAMS

~~1st~~ 2nd Reading

Lead Interim Society: CSAB

These program criteria apply to computing programs using data science, data analytics or similar terms in their titles.

Criterion 3. Student Outcomes

In addition to outcomes 1 through 5, graduates of the program will also have an ability to:

6. Apply theory, techniques, and tools throughout the data ~~analysis~~ science lifecycle and employ the resulting knowledge to satisfy stakeholders' needs. [DS]

Criterion 5. Curriculum

The curriculum requirements are in addition to the General Criteria curriculum requirements and specify topics, but do not prescribe specific courses.

These requirements are:

~~(a)~~ At least 45 semester credit hours (or equivalent) of data science course work that must cover:

1. Fundamental data ~~analysis~~ science lifecycle topics:

   a) Data acquisition and representativeness
   b) Data management
   c) Data preparation and integration
   d) Data analysis
   e) Model development and deployment
   f) Visualization and communication of the knowledge obtained from the data

2. Concepts that span and are applied to the data ~~analysis~~ science lifecycle:

   a) Data ethics including legitimate use and algorithmic fairness
   b) Governance including p~~Data p~~rivacy, ~~governance,~~ security, and stewardship
   ~~a)~~ Statistical and mathematical topics including inference, modeling, linear algebra, probability, and optimization
   ~~b)~~c) ~~Statistics and mathematics~~
   ~~c)~~d) Computing~~,~~ including ~~substantial coverage of~~ data structures~~,~~ and algorithms~~, and at least one programming language~~

3. Advanced data science coursework that provides depth.

4. Coverage of at least one application ~~domain~~ area to provide a context for data science activities.

5. A major project that ~~1)~~ incorporates an application ~~domain~~ area and ~~2)~~ requires integration and application of knowledge and skills acquired in earlier course work.