B.S. in DATA SCIENCE (120 CREDITS) DATE_____

ID_____ Curriculum Sheet for **Fall 2017** Catalog

DEARBORN DISCOVERY CORE (DDC) Requirements (24)

WRITTEN AND ORAL COMM. (6 credits)
Composition Placement Exam required
COMP 105 (3) and
COMP 270 (3)
Both required if not taken to fulfill DDC Written and Oral Communication

HUMANITIES AND THE ARTS (6 credits)
See DDC approved list in Degree Works or
HTTPS://APP.SMARTSHEET.COM/B/PUBLISH?EQBCT=DAFF687F800B4FE89910A9CEA66B1627

SOCIAL AND BEH. ANALYSIS (9 credits)
See DDC approved list in Degree Works or
HTTPS://APP.SMARTSHEET.COM/B/PUBLISH?EQBCT=DAFF687F800B4FE89910A9CEA66B1627

INTERSECTIONS (3 credits)

ENGR 400 or ENT 400 (required Business Courses for major) fulfill (3 cr) of Intersections.

Other (3 credits) must be chosen from DDC approved list in Degree Works or
HTTPS://APP.SMARTSHEET.COM/B/PUBLISH?EQBCT=DAFF687F800B4FE89910A9CEA66B1627

Important DDC Notes:

- DDC requirements apply to Freshmen admitted fall 2015 and later, and to Transfers admitted fall 2017 and later.
- Many DDC courses fulfill multiple categories. However, a single DDC course may be used for a **maximum of three** DDC categories
- DATA students MUST graduate with a minimum **120 credits**

****** **Beware NO-CREDIT courses**. **
NO-CREDIT listed at end of CECS Handbook:

https://umich.app.box.com/s/6a5c4j9hwlctnppzy7o2xjmvlrtumvoj

SCIENCES, COGNATES, AND APPLICATIONS (31)

LABORATORY SCIENCE (7)
See DDC approved list in Degree Works or
HTTPS://APP.SMARTSHEET.COM/B/PUBLISH?EQBCT=DAFF687F800B4FE89910A9CEA66B1627
Take two courses, 7 credits, one of which is a laboratory course

EDUCATION, HEALTH, & HUMAN SERVICES
HHS 470 (3) *Information Science & Ethics*

BUSINESS (3)
Take one of the following courses:
ENGR 400 (3) *Applied Bus Tech for Engineers*
ENT 400 (3) *Introduction to Entrepreneurship*

DATA SCIENCE APPLICATIONS (18)
Choose one of the areas below:

BUSINESS ANALYTICS
Take DS 310 (3) *Data Mining for Business Intelligence*, plus 18 credit hours in one of the following: Accounting, Finance, Technology Management, Supply Chain Management. Students must meet the prerequisites for the course. The additional 15 credit hours must have the same prefix; e.g. ACC, FIN, MKT, ITM, or OM.

APPLIED SOCIAL AND BEHAVIORAL SCIENCE
ANALYTICS
Take an additional 18 credits from any of the following: Political Science, Economics, History, Criminal Justice, Sociology, Anthropology, and Psychology. Students must meet the prerequisites for the course. In addition, the 18 disciplinary credits must have the same prefix; e.g. POL, ECN, HIST, CRJ, SOC, ANTH, or PSYC. As an exception, a student may substitute 6 credits of GIS for 6 of the discipline specific credits.

HEALTH AND MEDICINE ANALYTICS
Take an additional 18 credit hours from courses focusing on health and medicine. The proposed coursework must be approved by a faculty advisor in the Department of Health and Human Services prior to enrollment in the course.

COMPUTATIONAL ANALYTICS
Take an additional 18 credit hours from courses focusing on Applied Statistics, Mathematics, or Engineering and Computer Science. The proposed coursework must be approved by a faculty advisor in the Department of Mathematics or CECS, respectively, prior to enrollment in the course.

CIS COURSES and ELECTIVES (65)

BASIC REQUIREMENTS (18)
CIS 1501 (4) *Comp Science for Data Scientists I*
MATH 115 (4) *Calculus I*
(Fulfills DDC Quant. Thinking)
MATH 116 (4) Calculus II
MATH 205 or MATH 215 (3) Calculus III
MATH 227 (3) Linear Algebra

DATA SCIENCE CORE (34)
CIS 2001 (4) *Comp Science for Data Scientists II*
Take one of the following three courses:
CIS 275 (4) *Discrete Structures I*
MATH 276 (4) *Discrete Mathematics*
MATH 315 (4) *Applied Combinatorics*
CIS 350 (4) *Data Structures & Algorithm Analysis*
CIS 3200 (3) *Data Science II*
CIS 422 (4) *Big Data Management*
ECE 3100 (3) *Data Science I*
STAT 305 (3) *Introduction to Data Science*
Take one of the following two courses:
IMSE 317 (3) *Probability/Statistics*
STAT 325 (3) *Applied Statistics I*
STAT 326 (3) *Applied Statistics II*
STAT 430 (3) *Applied Regression Analysis*

DATA SCIENCE CAPSTONE (4)
CIS 4971 (2) *Cap Project for Data Scientists I*
CIS 4972 (2) *Cap Project for Data Scientists II*
(Senior Design Courses fulfill DDC Capstone Experience, Critical & Creative Thinking, and Upper-Level Writing)

DATA SCIENCE ELECTIVES* (6-8)
CIS 306 (4) *Discrete Structures II*
CIS 375 (4) *Software Engineering I*
CIS 423 (3) *Decision Support & Expert Systems*
CIS 425 (4) *Information Systems*
CIS 479 (3) *Artificial Intelligence*
CIS 481 (3) *Computational Learning*
CIS 490 (3) Data Security & Privacy for Data Scientists
DS 426 (3) *Introduction to Simulation*
ECE 427 (4) *Digital Content Protection*
ECE 428 (3) *Cloud Computing*
ECE 434 (4) *Machine Learning in Engineering*
IMSE 3005 (4) *Introduction to Operations Research*
IMSE 421 (3) *Eng Econ & Dec Analysis*
IMSE 4585 (4) *Simula in Systems Design*
IMSE 4795 (4) *Prod Inv Cont & Lean Mfg*
MATH 420 (3) *Stochastic Processes*
MATH 425 (3) *Mathematical Statistics*
MATH 462 (3) *Mathematical Modeling*
MATH 472 (3) *Introduction to Numerical Analysis*
MATH 473 (3) *Matrix Computation*
STAT 440 (3) *Design & Analysis of Experiments*
STAT 450 (3) *Multivariate Statistical Analysis*
STAT 460 (3) *Time Series Analysis*

GENERAL ELECTIVES* (1-3)

*****The total number of credits taken in DATA SCIENCE ELECTIVES and in GENERAL ELECTIVES must be at least 9