

Courses Approved as Social Data Analytics Electives – January 16, 2020

This list indicates courses approved as SoDA electives with designations as to the distribution requirements against which each may be counted. Students or faculty may request that the Social Data Analytics Program Committee consider any additional courses or designations.

Designations:

- A** counts against Analytics requirement
- Q** counts against Quantification requirement
- C** counts against Computational / Informational requirement
- S** counts against Social requirement
- DC1** counts against Departmental Cluster 1 requirement
- DC2** counts against Departmental Cluster 2 requirement

Departmental Clusters

Approved electives carrying any of the following prefixes meet the “STAT or primarily social science department” distribution requirement, or “DC1”:

Eberly College of Science: STAT

College of Liberal Arts: APLNG, CAS, CLJ, CRIM, ECON, PLSC, PSY, SOC

College of Health and Human Development: HDFS

Intercollege: DEMOG

Approved electives carrying any of the following prefixes meet the “GEOG, IST, or primarily computer science or engineering department” distribution requirement, or “DC2”:

College of Information Sciences & Technology: IST

College of Engineering: CMPSC, CSE, EE, IE

Intercollege: DS

Approved electives carrying any of the following prefixes do not fall into either departmental cluster:

Eberly College of Science: PHYS

Approved SoDA electives meeting the Analytics distribution requirement (A)

The following courses are approved as carrying the (A) designation without further approval required.

STAT	557	Data Mining: Techniques and Applications	DC1	+QC
STAT	558	Data Mining II	DC1	+QC
STAT	584	Machine Learning: Tools and Algorithms	DC1	+QC
CMPSC	448	Machine Learning and Algorithmic AI	DC2	+QC
CSE / IE / IST	561	Data Mining Driven Design	DC2	+QC
CSE	584	Machine Learning: Tools and Algorithms	DC2	+QC
IST	557	Data Mining I	DC2	+QC
IST	558	Data Mining II	DC2	+QC

The following variable title courses (597, unless otherwise indicated) have received temporary (A) designations:

HDFS	Data Mining for Human Development & Family Studies (Brick)	DC1	+QCS
PLSC	Robust Methods (Honaker)	DC1	+QCS
STAT	Statistical Learning Theory (Zue)	DC1	+QC
GEOG	Visual Analytics: Leveraging Geo-Social Data (MacEachren / Hardisty)	DC2	+CS
CSE	Advanced Big Data Analytics (Kifer)	DC2	+QC
CSE	Data-Mining and Analytics (Lee)	DC2	+QC
CSE	Machine Learning (Kifer)	DC2	+QC
CSE	Numerics of Data Mining and Image Processing (Barlow)	DC2	+QC
IST	Principles of Machine Learning (Honaver)	DC2	+QC

Approved Social Data Analytics Electives with Designations (Q), (C), and (S)

The following courses are approved as carrying (Q) (C) and (S) designations.

APLNG 578 Computational and Statistical Methods for Corpus Analysis DC1

The following variable title courses (597, unless otherwise indicated) have received temporary (Q) (C) and (S) designations:

HDFS Health Technology and Personal Data Collection [HDFS 497] (Brick) DC1

HDFS Bayesian Methods for Human Development & Family Studies (Oravec) DC1

HDFS Data Mining for Human Development & Family Studies* (Brick) DC1

PLSC Big Data and the Law (Zorn) DC1

PLSC Big Data Approaches to the Study of Political Representation (Monroe) [PLSC 551] DC1

PLSC Political Events Data (Schrodt) DC1

PLSC Robust Methods* (Honaker) DC1

PLSC Social and Political Network Analysis (Desmarais) DC1

PLSC Text as Data (Monroe) DC1

SOC Methods of Social Network Analysis (Felmlee) DC1

STAT Statistical Privacy in Large Databases (Slavkovic) DC1

CSE Computational Pragmatics (Passonneau) DC2

CSE Data Privacy, Learning and Statistical Analysis (Smith) DC2

CSE Social Network Data Analytics (Lee) DC2

GEOG Spatio-Temporal Movement Analysis (Andris) [GEOG 560] DC2

IST Data-Driven Approaches to Computational Theories of Language (Reitter) DC2

IST Principles of Artificial Intelligence (Honavar) DC2

IST How the Mind Works (Reitter) DC2

IST Visualization and Advanced Analysis of Social Networks (Yen / Kropczynski) DC2

** These courses also satisfy the analytics requirement (A).*

Approved Social Data Analytics Electives with Designations (Q) and (S)

The following courses are approved as carrying at least the (Q) and (S) designations.

CAS	563	Pairs & Pairings; Quantitative Methods for Interdependent Data
CLJ / SOC	515	Research Methods in Criminology and Deviance
COMM	506	Introduction to Mass Communication Research
COMM	516	Data Analysis
PLSC	501	Methods of Political Analysis
PLSC	502	Statistical Methods for Political Research
PLSC	503	Multivariate Analysis for Political Research
PLSC	504	Topics in Political Methodology
PLSC	505	Time Series Analysis in Political Science
PLSC / SOC	518	Survey Methods I: Survey Design
PLSC / SOC	519	Survey Methods II: Analysis of Survey Data
HDFS	516	Methods of Research in Human Development
HDFS	519	Methods of Statistical Analysis in Human Development
HDFS	523	Strategies for Data Analysis in Developmental Research
HDFS	526	Measurement in Human Development
HDFS	527	Social Epidemiology
HDFS	528	Observational Methodologies for Development
HDFS	530	Longitudinal Structural Equation Modeling
HDFS	534	Person-Specific Data Analysis
HDFS	536	Research Methods in Developmental Processes
HDFS	575	Applied Longitudinal Data Analysis

SOC	513	Sociological Research Methods
SOC	572	Foundations in Causal Analysis in the Social Sciences
SOC	573	Demographic Techniques
SOC	574	Statistical Methods for Social Research
SOC	575	Statistical Methods for Nonexperimental Research
SOC	576	Applied Mathematical Demography
SOC	577	Techniques of Event History Modeling
SOC	578	Multilevel Regression Models
SOC	579	Spatial Demography
STAT	507	Epidemiological Research Methods
STAT	509	Design and Analysis of Clinical Trials
PSY	507	Analysis of psychological data 1
PSY	508	Analysis of psychological data 2
PSY	511	Introduction to Classical and Modern Test Theory
PSY	531	Multilevel Theory, Measurement, & Analysis
PSY	535	Research methods in I/O Psychology

The following variable title courses (597, unless otherwise indicated) have received temporary (Q) and (S) designations:

CAS	Measurement (Dillard)
COMM	Advanced Data Analysis (Oliver)
HDFS	Advanced Topics in Latent Class Analysis (Bray)
HDFS / STAT	Item Response Theory Models for College Testing Data (Loken)
HDFS	Applied Longitudinal Data Analysis (Ram)
HDFS	Intensive Longitudinal Data (Ram)
HDFS	Person-Specific EMA (Molenaar)

HDFS	Quasi-Experimental Methods (Shores)
PLSC	Causal Inference (Keele)
PLSC	Measurement Theory (Fariss)
SOC	Causal Analysis (Firebaugh)
SOC	Spatial Analysis of Social Data (Chi)
SOC	Seminar in Longitudinal Analysis (Johnson)
STAT	Spatial Models (Shaby)
PSY	Introduction to exploratory data analysis and data management (Hallquist)
PSY	Structural equation modeling (Johnson)
PSY	Transparent, Open, and Reproducible Research Practices in the Social and Behavioral Sciences (Gilmore)

Currently, all QS courses are in departmental cluster 1 (DC1).

Approved Social Data Analytics Electives with Designations (Q) and (C)

The following courses are approved as carrying at least the (Q) and (C) designations.

STAT	540	Statistical Computing	DC1
STAT	555	Statistical Analysis of Genomics Data	DC1
STAT	557	*Data Mining: Techniques and Applications (formerly Data Mining I)	DC1
STAT	558	*Data Mining II	DC1
STAT	561	Statistical Inference 1	DC1
STAT / CSE	584	*Machine Learning: Tools and Algorithms	DC1/2

CMPSC	448	*Machine Learning and Algorithmic AI	DC2
CSE	550	Numerical Linear Algebra	DC2
CSE	551	Numerical Solution of Ordinary Differential Equations	DC2
CSE	552	Numerical Solution of Partial Differential Equations	DC2
CSE	553	Introduction to Approximation Theory	DC2
CSE	555	Numerical Optimization Techniques	DC2
CSE	556	Finite Element Methods	DC2
CSE	557	Concurrent Matrix Computation	DC2
CSE	560	Theory of Graphs and Networks	DC2
CSE / IE / IST	561	*Data Mining Driven Design	DC2
CSE	562	Probabilistic Algorithms	DC2
CSE	564	Complexity of Combinatorial Problems	DC2
CSE	583	Pattern Recognition—Principles and Applications (EE 552)	DC2
CSE	585	Digital Image Processing II (EE 555)	DC2
CSE	586	Topics in Computer Vision	DC2
DS	410	Data Analytics at Scale	DC2
GEOG	586	Geographic Information Analysis	DC2
IST	556	Web Analytics: Research Approaches for Online Data	DC2
IST	557	*Data Mining: Techniques and Applications (formerly Data Mining I)	DC2
IST	558	*Data Mining II	DC2
IST	562	Theoretical Foundations of Information Science	DC2
PHYS	580	Elements of Network Science and Its Applications	no DC

The following variable title courses (597, unless otherwise indicated) have received temporary (Q) and (C) designations:

STAT	Bayesian Studies (Lin)	DC1
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STAT	High-Dimensional Modeling and Applications (R Li)	DC1
STAT	*Statistical Learning Theory (Zue)	DC1
CSE	*Advanced Big Data Analytics (Kifer)	DC2
CSE	*Data-Mining and Analytics (Lee)	DC2
CSE	Natural Language Processing (Passonneau)	DC2
CSE	Deep Learning for Pattern Discovery	DC2
CSE	Graph Mining (Madduri)	DC2
CSE	*Machine Learning (Kifer)	DC2
CSE	*Numerics of Data Mining and Image Processing (Barlow)	DC2
CSE	Regularity on Interdisciplinary Large Data Sets (Liu)	DC2
CSE	Vision-Based Tracking (Collins)	DC2
GEOG	Advanced Observation of Earth [GEOG 497] (Cervone)	DC2
GEOG	GeoInformatics (Cervone)	DC2
IST	Big Data Fundamentals (Yen / Giles)	DC2
IST	Artificial Emotional Intelligence (Wang)	DC2
IST	Reproducibility in Data Science (Rajtmajer)	DC2
IST	*Principles of Machine Learning (Honaver)	DC2
IST	Natural Language Processing for Sentiment, Semantics, and Discourse (Wilson)	DC2
MATH	Hierarchical Algorithms and Deep Learning (Xu)	no DC

** These courses also satisfy the analytics requirement (A).*

Approved Social Data Analytics Electives with Designations (C) and (S)

The following courses are approved as carrying at least the (C) and (S) designations.

GEOG	571	Intelligence Analysis, Cultural Geography, and Homeland Security	DC2
GEOG	588	Planning GIS for Emergency Management	DC2
GEOG	591	GIS for Health Analysis	DC2
IST	530	Foundations in Social Informatics	DC2
IST	555	Intelligent Agents and Distributed Decision Making	DC2

The following variable title courses (597, unless otherwise indicated) have received temporary (C) and (S) designations:

PSY	Transparent, Open, and Reproducible Research Practices in the Social and Behavioral Sciences [PSY 511] (Gilmore)	DC1
GEOG	Spatial Thinking (Klippel)	DC2
GEOG	*Visual Analytics: Leveraging Geo-Social Data (MacEachren / Hardisty)	DC2
GEOG	Representation and Analysis of Space-Time Dynamics [GEOG 560] (Peuquet)	DC2
GEOG	Virtual Reality for the Environmental and Spatial Sciences [GEOG 560] (Klippel)	DC2
IST	AI For Humanity (Yadav)	DC2

** These courses also satisfy the analytics requirement (A).*

Approved Social Data Analytics Electives with Designation (Q)

The following courses are approved as carrying the (Q) designation.

STAT 500, 501, 502, 503, 504, 505, 506, 510, 511, 512, 513, 514, 515, 517, 518, 519, 525, 544, 551, 552, 553, 562, 565

Approved Social Data Analytics Electives with Designations (C) and (A)

The following courses are approved as carrying at least the (C) and (A) designations.

The following variable title courses (597, unless otherwise indicated) have received temporary (C) and (A) designations:

GEOG Geovisual Analytics [GEOG 560] (Robinson) DC2

Approved Social Data Analytics Electives with Designations (C), (A), and (S)

The following courses are approved as carrying at least the (C), (A), and (S) designations.

The following variable title courses (597, unless otherwise indicated) have received temporary (C), (A), and (S) designations:

GEOG Geosocial Visual Analytics (MacEachren) DC2

Approved Social Data Analytics Electives with Designation (S)

The following courses are approved as carrying the (S) designation.

Departmental Cluster DC1:

CLJ 500, 501, 512, 558

HDFS 501, 502, 506, 509, 520, 522, 524, 525, 528, 529, 531, 532, 533, 537, 539, 540, 544, 546, 549, 565, 569, 577, 579

PLSC 534, 540, 541, 542, 550, 551, 552, 553, 554, 555, 556, 560, 561, 563, 564, 565, 566, 586

SOC 501, 502, 512, 521, 522, 523, 524, 525, 526, 527, 528, 529, 540, 531, 532, 533, 534, 537, 538,

544, 546, 551, 553, 557, 560, 584

Departmental Cluster DC2:

GEOG 501B, 501C, 520

IST 520, 521, 526, 556

Approved Social Data Analytics Electives with Designation (C)

The following courses are approved as carrying at least the (C) designation.

CSE 520, 522, 530, 531, 532, 537, 541, 542, 563, 565, 588

GEOG 501D, 560, 565, 583, 584, 585

IST 441, 510

The following variable title courses (597, unless otherwise indicated) have received temporary (C) designations:

CSE Public Cloud Computing (Urgaonkar)

GEOG Advanced Geographic Information Systems Modeling [GEOG 497] (Andris)

GEOG What Can Radar and Electro-optical Remote Sensing Do for You? [GEOG 560] (Cervone)

PSY Seminar in Matlab